

Economic Analysis of Animal Agriculture 2004-2014

UNITED STATES

Prepared
for:



Prepared
by:



September 2015

Contents

| | |
|---|-----|
| Acknowledgements..... | 4 |
| U.S. Executive Summary | 5 |
| Introduction | 6 |
| National Results | 8 |
| U.S. Economic Impact of Animal Agriculture | 8 |
| U.S. Total Animal Agriculture Soybean Meal Consumption | 20 |
| U.S. Total Animal Unit (AU) Trends..... | 33 |
| State Level Results | 50 |
| 2004-2014 Economic Analysis of Animal Agriculture: ALABAMA..... | 50 |
| 2004-2014 Economic Analysis of Animal Agriculture: ALASKA..... | 64 |
| 2004-2014 Economic Analysis of Animal Agriculture: ARIZONA | 78 |
| 2004-2014 Economic Analysis of Animal Agriculture: ARKANSAS..... | 92 |
| 2004-2014 Economic Analysis of Animal Agriculture: CALIFORNIA..... | 106 |
| 2004-2014 Economic Analysis of Animal Agriculture: COLORADO..... | 120 |
| 2004-2014 Economic Analysis of Animal Agriculture: CONNECTICUT..... | 134 |
| 2004-2014 Economic Analysis of Animal Agriculture: DELAWARE..... | 148 |
| 2004-2014 Economic Analysis of Animal Agriculture: FLORIDA | 162 |
| 2004-2014 Economic Analysis of Animal Agriculture: GEORGIA | 176 |
| 2004-2014 Economic Analysis of Animal Agriculture: HAWAII..... | 190 |
| 2004-2014 Economic Analysis of Animal Agriculture: IDAHO | 204 |
| 2004-2014 Economic Analysis of Animal Agriculture: ILLINOIS..... | 220 |
| 2004-2014 Economic Analysis of Animal Agriculture: INDIANA | 234 |
| 2004-2014 Economic Analysis of Animal Agriculture: IOWA..... | 248 |
| 2004-2014 Economic Analysis of Animal Agriculture: KANSAS | 262 |
| 2004-2014 Economic Analysis of Animal Agriculture: KENTUCKY..... | 276 |
| 2004-2014 Economic Analysis of Animal Agriculture: LOUISIANA | 290 |
| 2004-2014 Economic Analysis of Animal Agriculture: MAINE | 304 |
| 2004-2014 Economic Analysis of Animal Agriculture: MARYLAND | 318 |
| 2004-2014 Economic Analysis of Animal Agriculture: MASSACHUSETTS..... | 332 |
| 2004-2014 Economic Analysis of Animal Agriculture: MICHIGAN..... | 346 |
| 2004-2014 Economic Analysis of Animal Agriculture: MINNESOTA..... | 360 |

| | |
|---|-----|
| 2004-2014 Economic Analysis of Animal Agriculture: MISSISSIPPI | 374 |
| 2004-2014 Economic Analysis of Animal Agriculture: MISSOURI..... | 388 |
| 2004-2014 Economic Analysis of Animal Agriculture: MONTANA | 402 |
| 2004-2014 Economic Analysis of Animal Agriculture: NEBRASKA..... | 416 |
| 2004-2014 Economic Analysis of Animal Agriculture: NEVADA | 430 |
| 2004-2014 Economic Analysis of Animal Agriculture: NEW HAMPSHIRE..... | 444 |
| 2004-2014 Economic Analysis of Animal Agriculture: NEW JERSEY | 458 |
| 2004-2014 Economic Analysis of Animal Agriculture: NEW MEXICO | 472 |
| 2004-2014 Economic Analysis of Animal Agriculture: NEW YORK | 486 |
| 2004-2014 Economic Analysis of Animal Agriculture: NORTH CAROLINA..... | 500 |
| 2004-2014 Economic Analysis of Animal Agriculture: NORTH DAKOTA..... | 514 |
| 2004-2014 Economic Analysis of Animal Agriculture: OHIO | 528 |
| 2004-2014 Economic Analysis of Animal Agriculture: OKLAHOMA..... | 542 |
| 2004-2014 Economic Analysis of Animal Agriculture: OREGON..... | 556 |
| 2004-2014 Economic Analysis of Animal Agriculture: PENNSYLVANIA | 570 |
| 2004-2014 Economic Analysis of Animal Agriculture: RHODE ISLAND..... | 584 |
| 2004-2014 Economic Analysis of Animal Agriculture: SOUTH CAROLINA | 598 |
| 2004-2014 Economic Analysis of Animal Agriculture: SOUTH DAKOTA | 612 |
| 2004-2014 Economic Analysis of Animal Agriculture: TENNESSEE..... | 626 |
| 2004-2014 Economic Analysis of Animal Agriculture: TEXAS | 640 |
| 2004-2014 Economic Analysis of Animal Agriculture: UTAH | 654 |
| 2004-2014 Economic Analysis of Animal Agriculture: VERMONT | 668 |
| 2004-2014 Economic Analysis of Animal Agriculture: VIRGINIA | 682 |
| 2004-2014 Economic Analysis of Animal Agriculture: WASHINGTON..... | 696 |
| 2004-2014 Economic Analysis of Animal Agriculture: WEST VIRGINIA | 710 |
| 2004-2014 Economic Analysis of Animal Agriculture: WISCONSIN | 724 |
| 2004-2014 Economic Analysis of Animal Agriculture: WYOMING..... | 738 |
| Methodology..... | 752 |
| Appendix A, Subject Matter Experts..... | 766 |

Acknowledgements

Much of the research contained in this report, particularly with that related to consumption of soybean meal, would not have been possible without the help of many animal nutrition experts around the United States. These experts provided invaluable assistance in understanding the feeding dynamics for livestock, poultry and companion animals during 2014. Those who were especially helpful include:

- Carlos A. Campabadal Teran, Ph.D., Kansas State University
- Jason Woodworth, Ph.D., Kansas State University
- Justin Fowler, Ph.D., University of Georgia
- Michael Hutjens, Ph.D., University of Illinois

A full list of subject matter experts who provided excellent assistance can be found in Appendix A.

U.S. Executive Summary

Animal agriculture continues to be an important driver of economic activity in the United States. Through purchases and sales to many other industries, U.S. animal agriculture in turn has a large impact on the rest of the national and global economies. In the U.S. during 2014 animal agriculture's support of the national economy included:

- \$440.7 billion in economic output
- 2,363,477 jobs
- \$76.7 billion in earnings
- \$19.6 billion in income taxes
- \$7.4 billion in the form of property taxes

In addition, from 2004-2014, U.S. animal agriculture increased gross national product by \$123 billion in economic output, boosted household earnings by over \$21 billion and supported an additional 645,629 jobs.

Due to continued effects of severely dry conditions from 2011-2013, animal agriculture, particularly beef cattle, has shifted north and east to the Upper Plains and Midwest areas (North Dakota, South Dakota, Nebraska, and Iowa) of the United States, largely in pursuit of better access to key feed ingredients.

The use of soybean meal as a key feed ingredient is an important part of U.S. animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, animal agriculture and soybean meal are key factors in each animal sector's success. During 2014, animal agriculture consumed an estimated 27.9 million tons of soybean meal, approximately the same amount as 2013. In the U.S., this soybean meal was fed primarily to:

- Broilers: 11.2 million tons
- Hogs: 7.9 million tons
- Dairy Cows: 2.7 million tons

This report examines U.S. animal agriculture over the last decade. While this is certainly instructive and allows one to understand the impact of animal agriculture during that time, as the next decade unfolds in the U.S., many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be an important contributor to the economic well-being of the American people and beyond.

Introduction

Domestic U.S. animal agriculture faces significant challenges in addressing growing global demand for protein. Constraints on land and water use, environmental impacts and other regulatory activity may limit the ability to simply add enough cattle, hogs and poultry to meet future protein demand.

Water and air pollution from livestock manure have been at the forefront of federal and state level regulatory discussions. Confined animal feeding operations are often cited as the most problematic with respect to waste storage and removal, which has led to ambiguous and inconsistent regulations across county and state boundaries. As a result, litigation related to these environmental issues is a growing problem in the United States.

Animal welfare is also a controversial topic in today's animal agriculture because of a variety of opinions regarding how animals should be raised. The controversy over farm animal welfare issues is mainly related to some management practices that may negatively impact animal welfare (e.g. increased stocking density). Increasing public awareness of the conditions prevalent in confinement agriculture (e.g., gestation and farrowing crates for swine, battery cages for layers) has led some consumers to demand changes in animal agriculture.

Animal identification and traceability systems have a key role to play in the future of animal agriculture industry in the United States. Identification and traceability systems may emerge rapidly during the next few years to enhance the ability to respond to natural and intentional disease outbreaks (biosecurity risks), improve food safety, and provide assurances of food quality.

Legal uncertainty associated with immigration and labor issues present major implications to animal agriculture in the United States. Many segments in the United States' food system depend on a foreign-born labor force. To reduce labor risk, multiple sectors of the food system, from animal agriculture to restaurants, need the assurance of a straightforward, consistently-applied guest worker program that provides at least temporary legal status to their workforce.

One of the biggest challenges facing animal agriculture will be meeting the increased food needs of a growing global population. It is estimated that the world's population will reach nine billion people by the year 2050. Global food production will need to double in order to meet these food demands. By the year 2050, the Food and Agriculture Organization (FAO) estimates that there will be a rise of 73 percent in meat and poultry consumption. In order to meet increasing demand in a sustainable way, livestock producers must continue to increase production capacity and efficiency. In that context, soybean meal use in domestic feed rations plays a vital role.

According to results from this study, in the 2013-2014 soybean marketing year, domestic animal agriculture consumed approximately 27.9 million tons of soybean meal in the U.S., making animal agriculture the largest source of demand for soybean meal in the U.S. Hence, soybean growers should be concerned about, and be supportive of, the future of animal agriculture in the U.S.

Domestic animal agriculture consists of mainly broilers, turkeys, egg-laying hens (layers), hogs, dairy cows, beef cows, companion animals (horses, cats and dogs), aquaculture, sheep and meat goats. Future soybean demand is tightly linked to the health of these industries. Long-term competitiveness in animal agriculture is critical to the continued success of soybean farming in the U.S. Challenges facing animal agriculture and its allied industries have a significant impact on the soybean industry.

Animal agriculture plays a vital role in the economy and also faces numerous challenges in years to come. Its impact has far-reaching effects on economies at both the national and state levels. To better understand the extent to which animal agriculture supports economic activity and soybean meal demand, the United Soybean Board commissioned this economic analysis of U.S. animal agriculture to be completed by Decision Innovation Solutions of Urbandale, Iowa.

National Results

The National Results section details the results of all three components of this analysis. These components are: 1) Economic Impacts of Animal Agriculture, 2) Animal Agriculture Soybean Meal Consumption and 3) Animal Unit Trends.

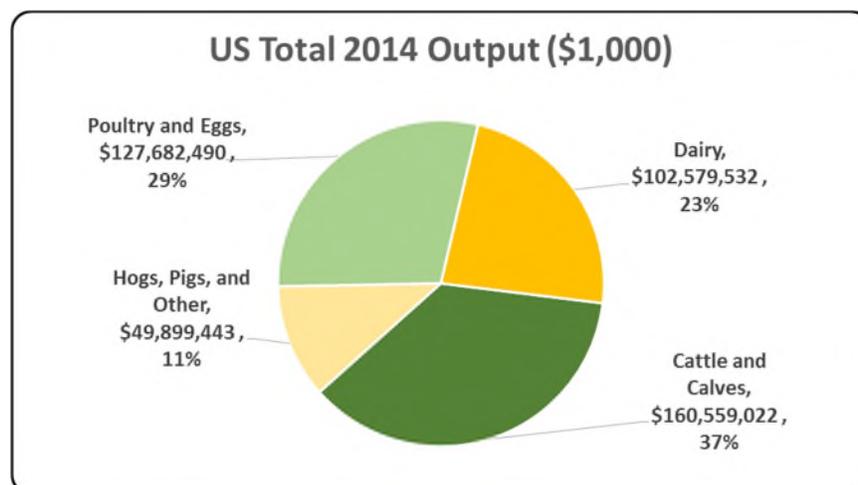
U.S. Economic Impact of Animal Agriculture

This section details the impact of animal agriculture for the U.S. during 2004-2014. As demonstrated, animal agriculture is an integral part of the U.S. economy. The results of the analysis indicate that diminishment or removal of any one of the animal agriculture industries will cause negative impacts to the remaining industries within the state and beyond. Table 1 (at the end of this section) shows state-by-state estimated 2014 economic impacts of animal agriculture. During the last decade in the U.S., animal agriculture has contributed to the following measures of economic activity:

- \$122.8 billion increase in economic output
- \$21.3 billion expansion in household earnings
- 645,629 more jobs
- \$21.4 billion more income taxes paid

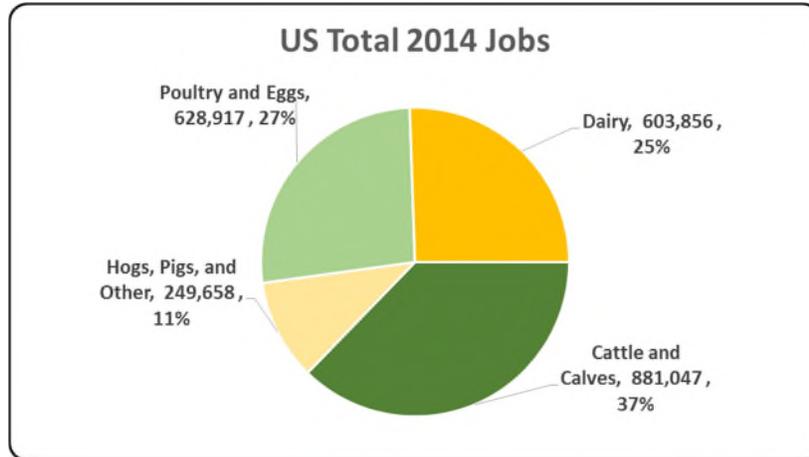
U.S. Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers from the U.S. Bureau of Economic Analysis. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. As shown, animal agriculture provides a significant impact to the U.S. economy, with about \$440.7 billion in output within and outside of animal agriculture. The 2003-2013 version of this analysis estimated animal agriculture to have provided a \$371.1 billion output impact in 2013. This analysis suggests that animal agriculture’s economic impact grew by \$69.5 billion between 2013 and 2014.



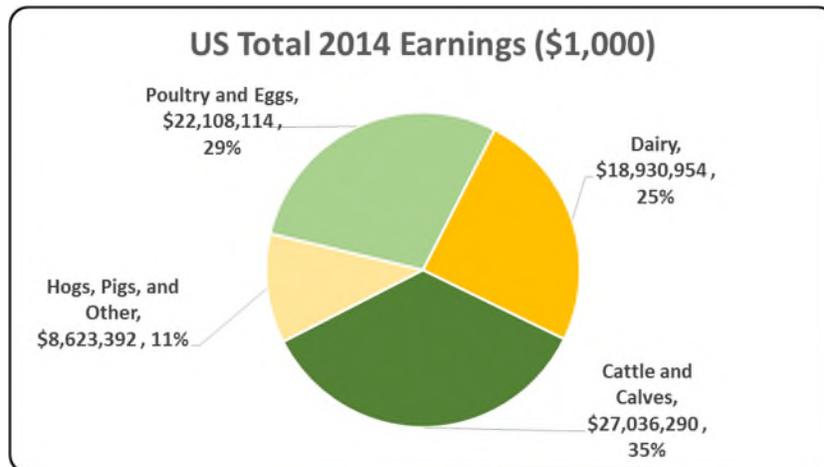
U.S. Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart below illustrates the impact to the U.S. in terms of animal agriculture jobs. Animal agriculture contributes significantly to U.S. total jobs, contributing 2,363,477 jobs within and outside of animal agriculture. The 2003-2013 version of this analysis estimated animal agriculture supported 1,984,318 jobs in 2013. Jobs generated by animal agriculture increased by 379,159 between 2013 and 2014.



U.S. Earnings

Earnings includes wages and salaries and proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart below illustrates the impact of animal agriculture to the U.S. economy in terms of earnings. About \$76.7 billion in earnings can be attributed to animal agriculture in U.S. The 2003-2013 version of this analysis estimated animal agriculture provided a \$64.6 billion earnings impact in 2013. Results of this analysis suggest an increase of \$12.1 billion over prior year estimates.



U.S. by State Economic Impact Results

Animal agriculture is very important to the economy of all states across the U.S. In terms of output, animal agriculture helped generate \$43 billion in Texas alone for 2014. Other states where animal agriculture is a major contributor to the state’s economy include Iowa, California, Nebraska and North Carolina. Table 1 on page 18 lists the changes in output, earnings, employment, and income taxes paid in 2014 for each state.

2014 Animal Agriculture Output (\$M)

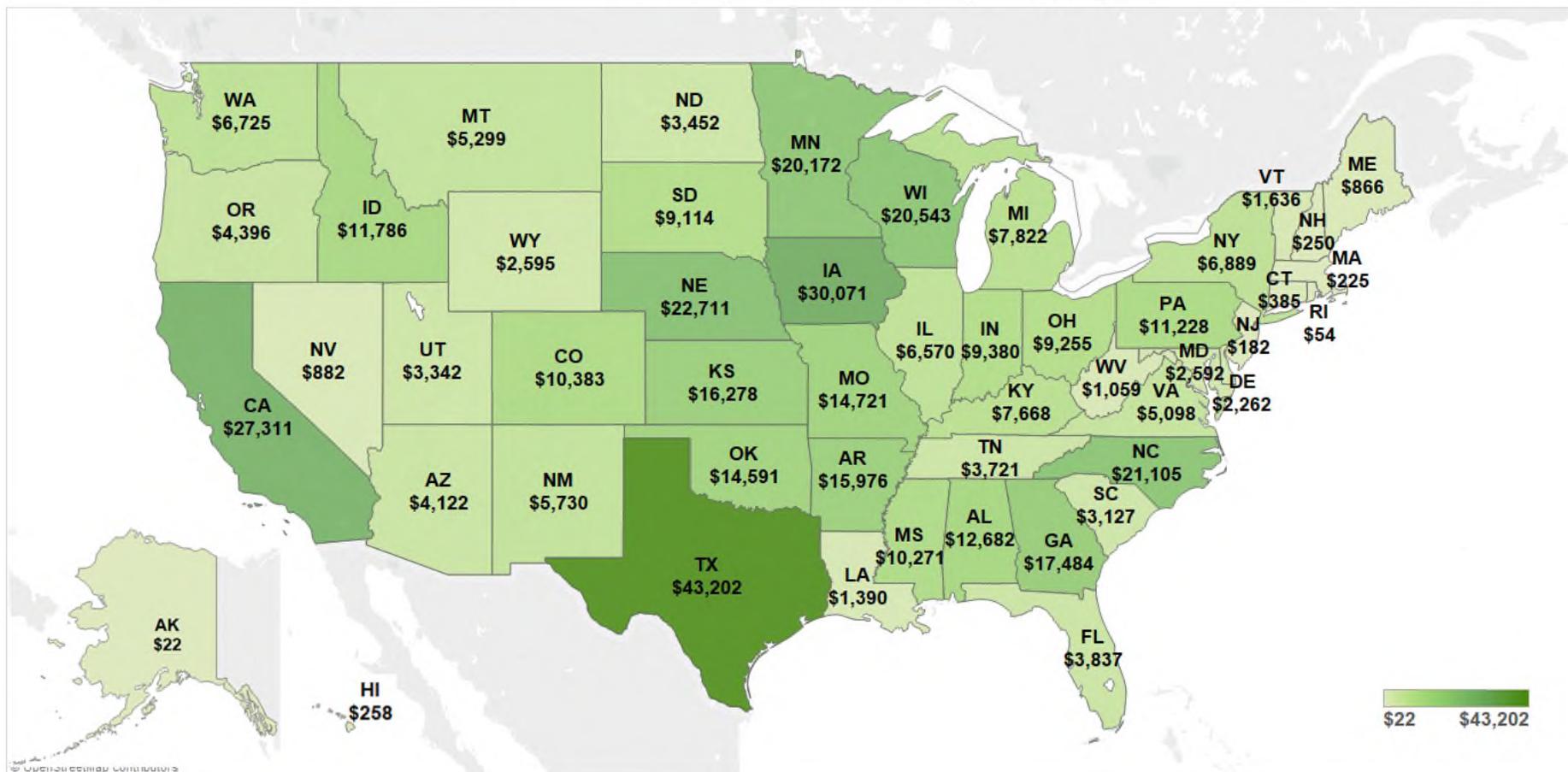


Figure 1, U.S. Animal Agriculture Output (\$M)

The vast majority of the United States saw increases in the percent change of output supported by animal agriculture during the 2004-2014 time period. States with exceptionally large increases include Iowa, Idaho and Michigan. Table 2 on page 19 lists the changes in output, earnings, employment, and income taxes paid from 2004 to 2014 for each state.

2004-2014 % Change in Animal Agriculture Output

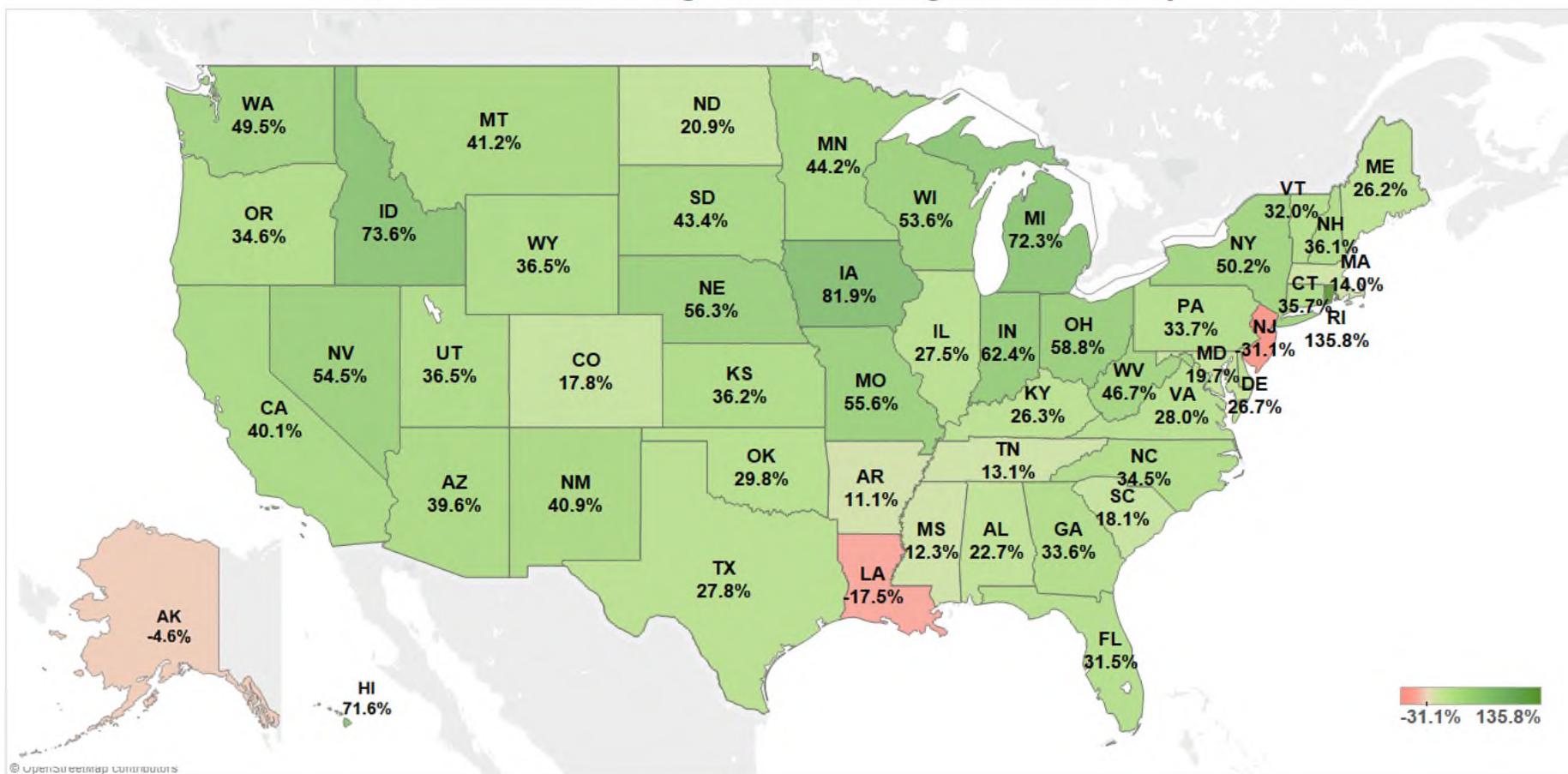


Figure 2, 2004-2014 % Change in Animal Agriculture Output

In 2014, animal agriculture supported 287,445 jobs in Texas, 145,500 in Wisconsin, 128,621 in Iowa, and 124,322 in California. In states where the sector is robust, animal agriculture supports 75,000 jobs or more every year.

2014 Animal Agriculture Employment

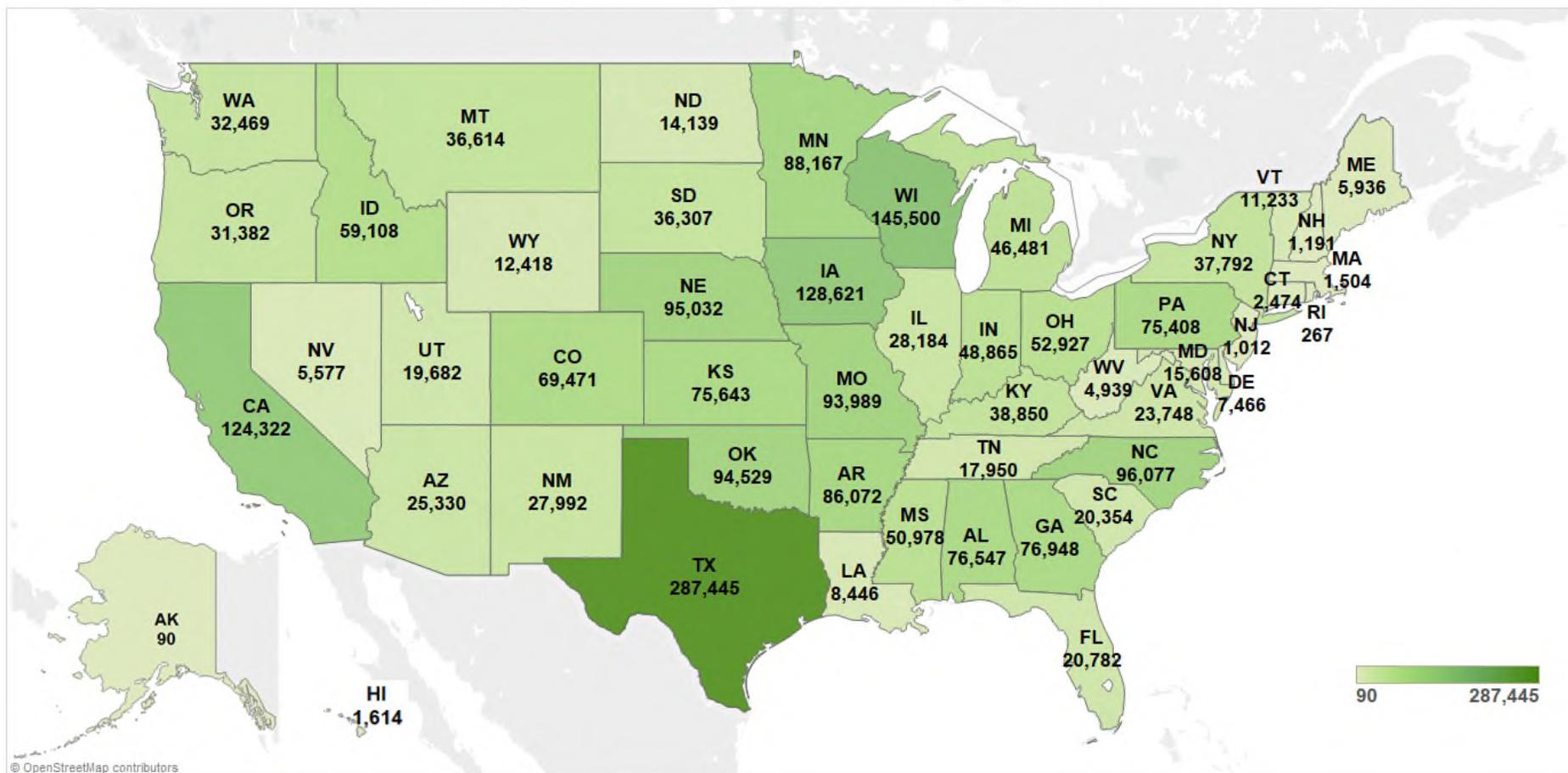


Figure 3, U.S. Animal Agriculture - Employment (Jobs)

Many states saw major job gains supported by animal agriculture in the 2004-2014 time period. Over the past decade, animal agriculture generated job gains of between 40-60 percent in about half of the 50 states.

2004-2014 % Change in Animal Agriculture Employment

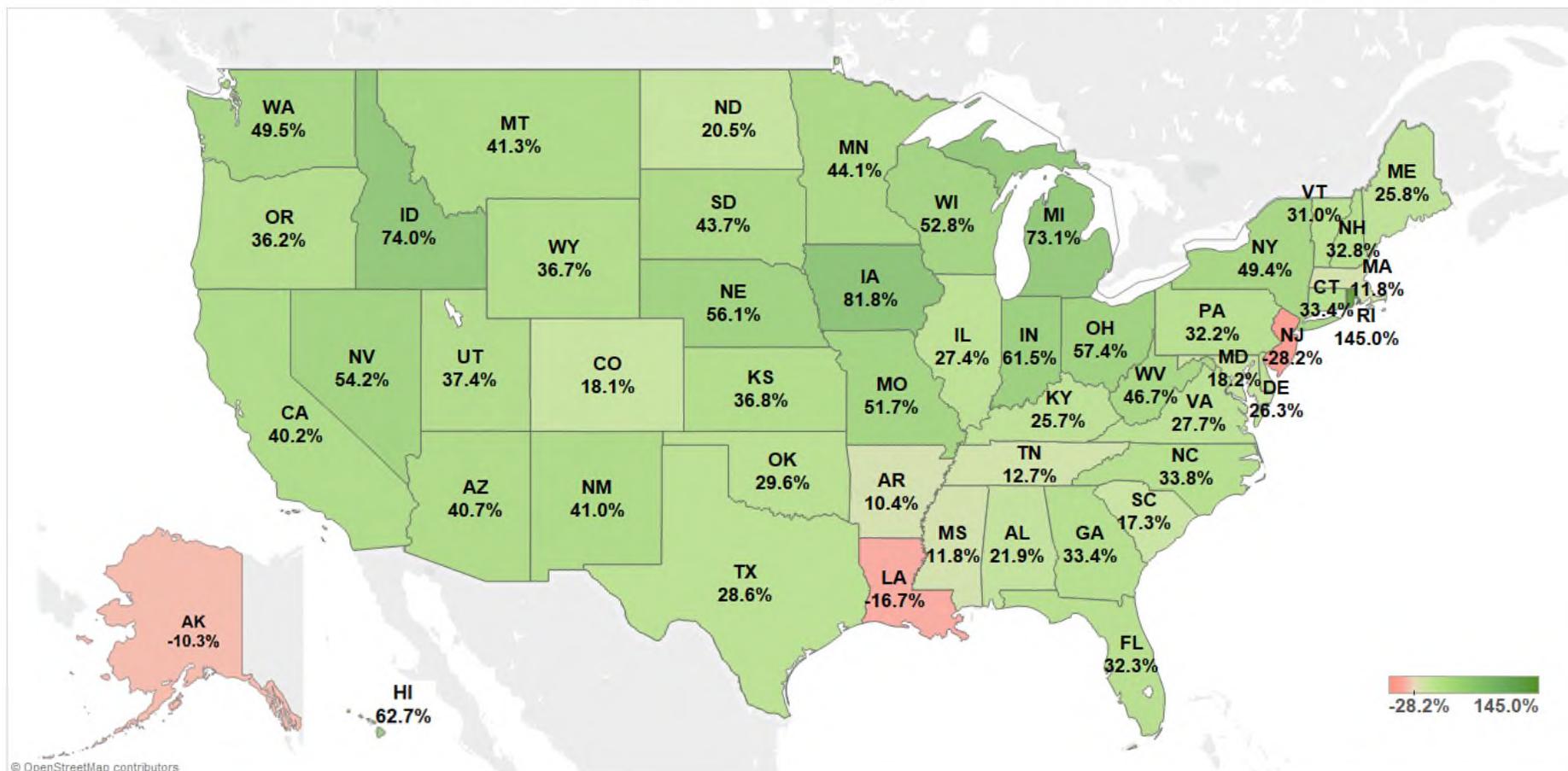


Figure 4, 2004-2014 % Change in Animal Agriculture Employment

Earnings are an important component of a local economy since they allow households to invest capital and spend currency that trades hands many times, generating additional economic activity. Animal agriculture helped generate nearly \$8 billion in household earnings in the state of Texas alone in 2014. Animal agriculture contributes heavily to earnings in many other states like California, Iowa, Wisconsin, Minnesota and more.

2014 Animal Agriculture Earnings (\$M)

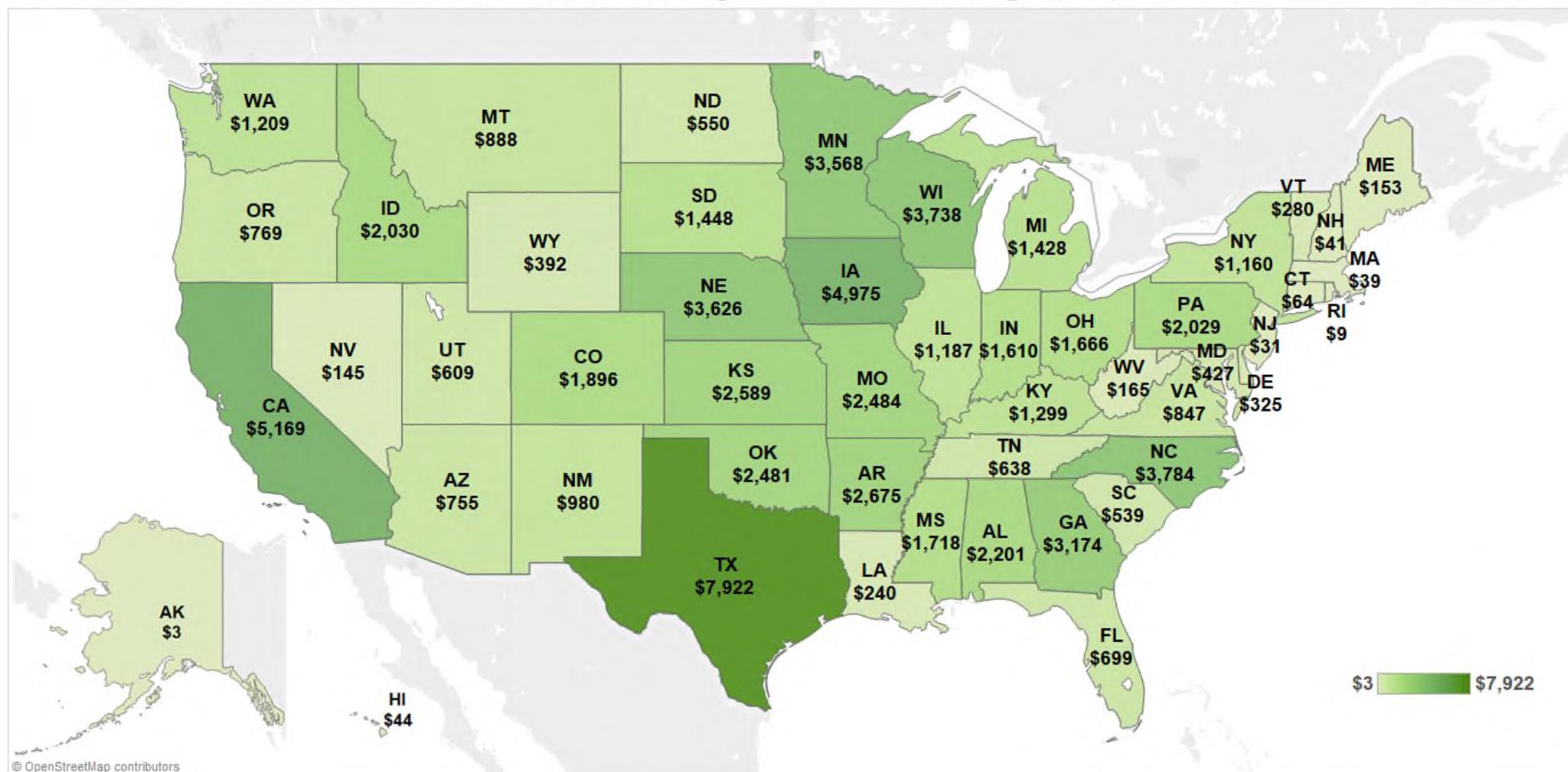


Figure 5, U.S. Animal Agriculture - Earnings (\$M)

States where animal agriculture increased earnings by 70% or more over the past decade include Iowa, Idaho and Michigan. Many states, including Wisconsin, Ohio, Missouri, Nebraska, Nevada and Washington saw earnings increase at or above 50 percent from 2004-2014.

2004-2014 % Change in Animal Agriculture Earnings

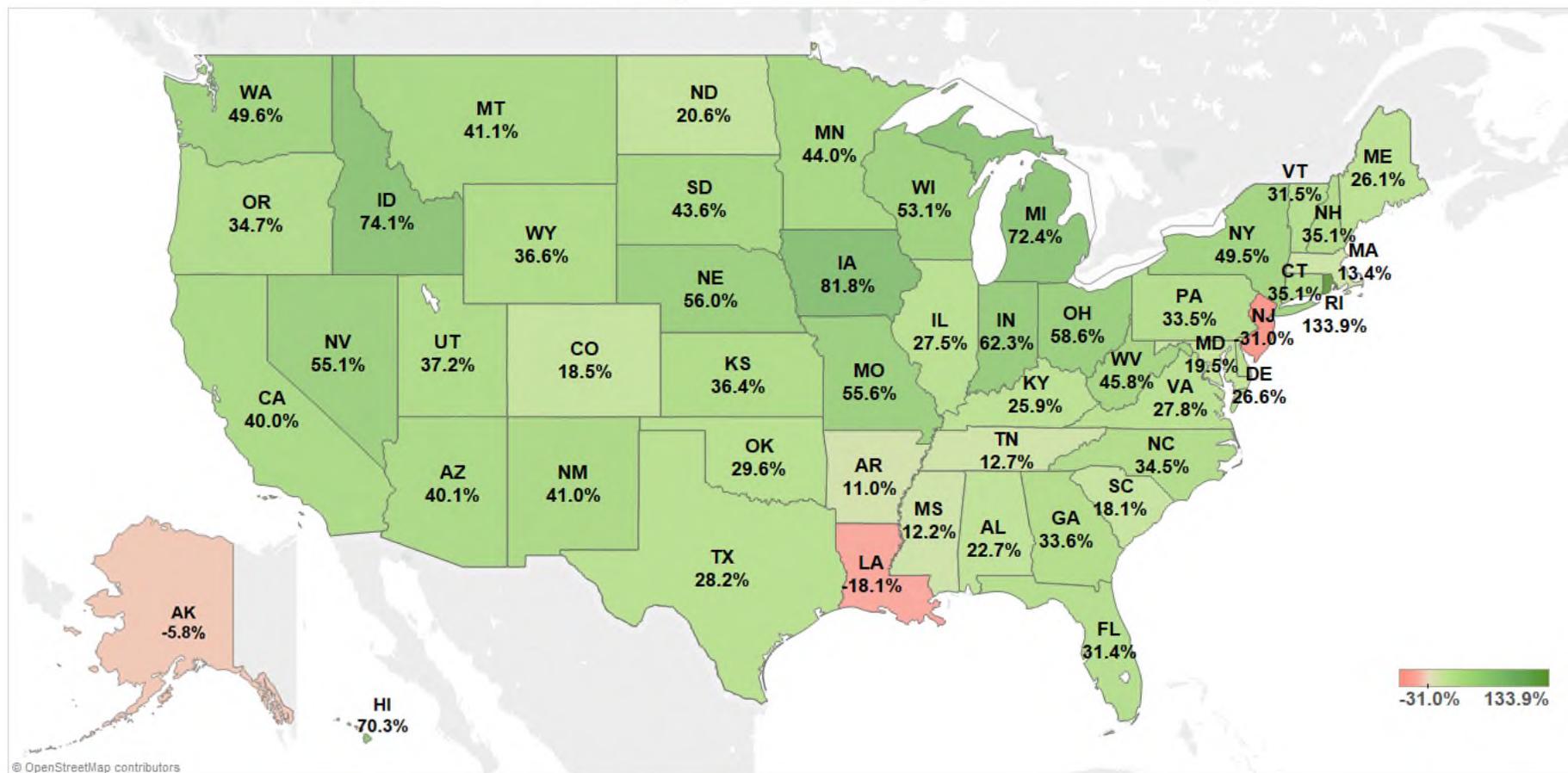


Figure 6, 2004-2014 % Change in Animal Agriculture Earnings

Aside from the large amounts of economic activity derived from animal agriculture across the country, animal agriculture plays an important part in supporting local, state and federal taxing jurisdictions. A direct relationship to the size and scope of animal agriculture yields significant income tax payments in states such as Texas, California, Iowa, Wisconsin, and North Carolina. Numerous other states paid estimated taxes greater than \$750 million during 2014.

2014 Animal Agriculture Income Taxes Paid (\$M)

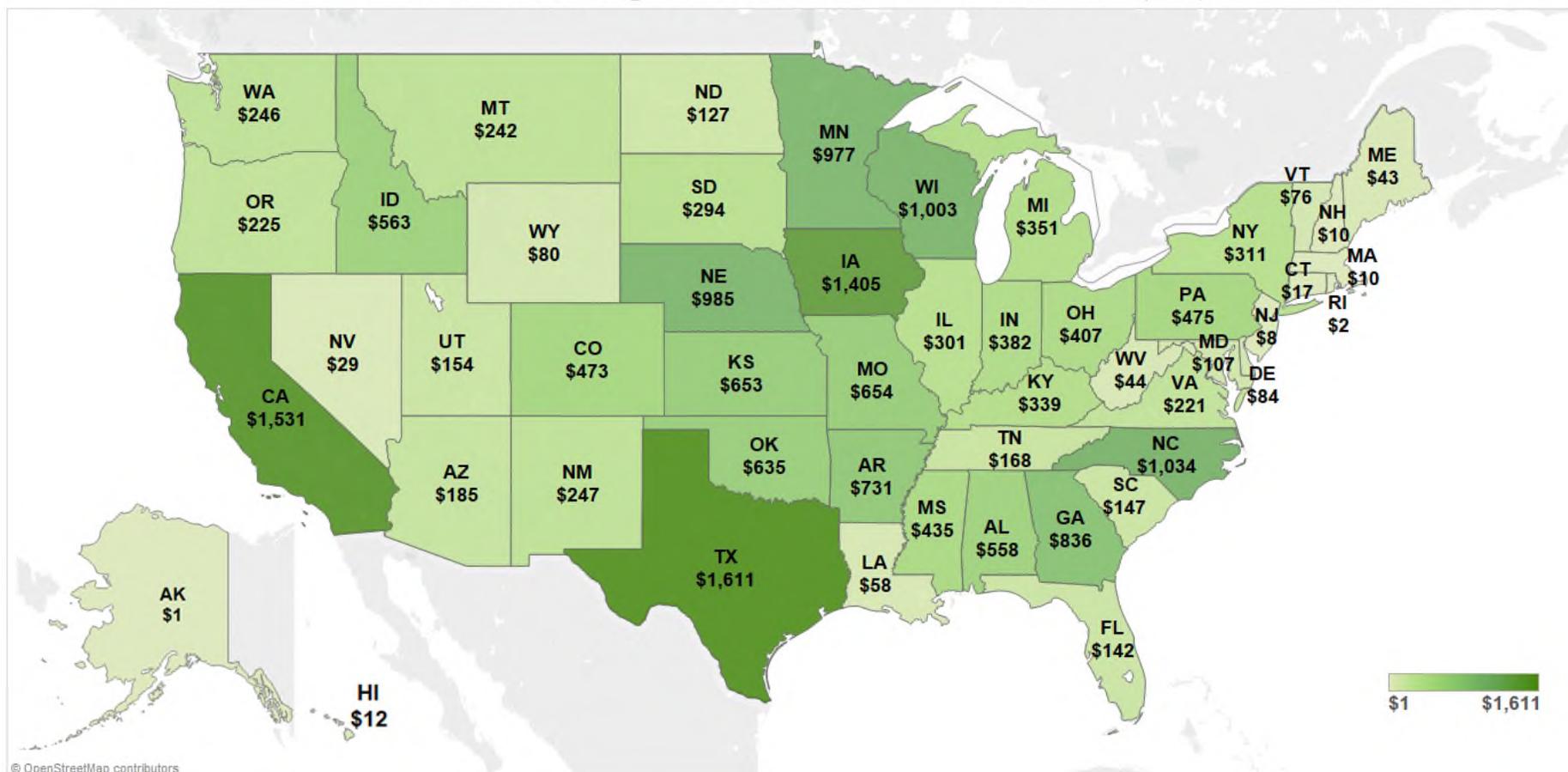


Figure 7, 2014 Animal Agriculture – Income Taxes Paid (\$M)

Income taxes paid at the local, state, and federal jurisdictions increased substantially over the last decade. States such as Idaho, Michigan, Iowa, and Nevada were among top states for growth in estimated income tax payments.

2004-2014 % Change in Animal Agriculture Income Taxes Paid

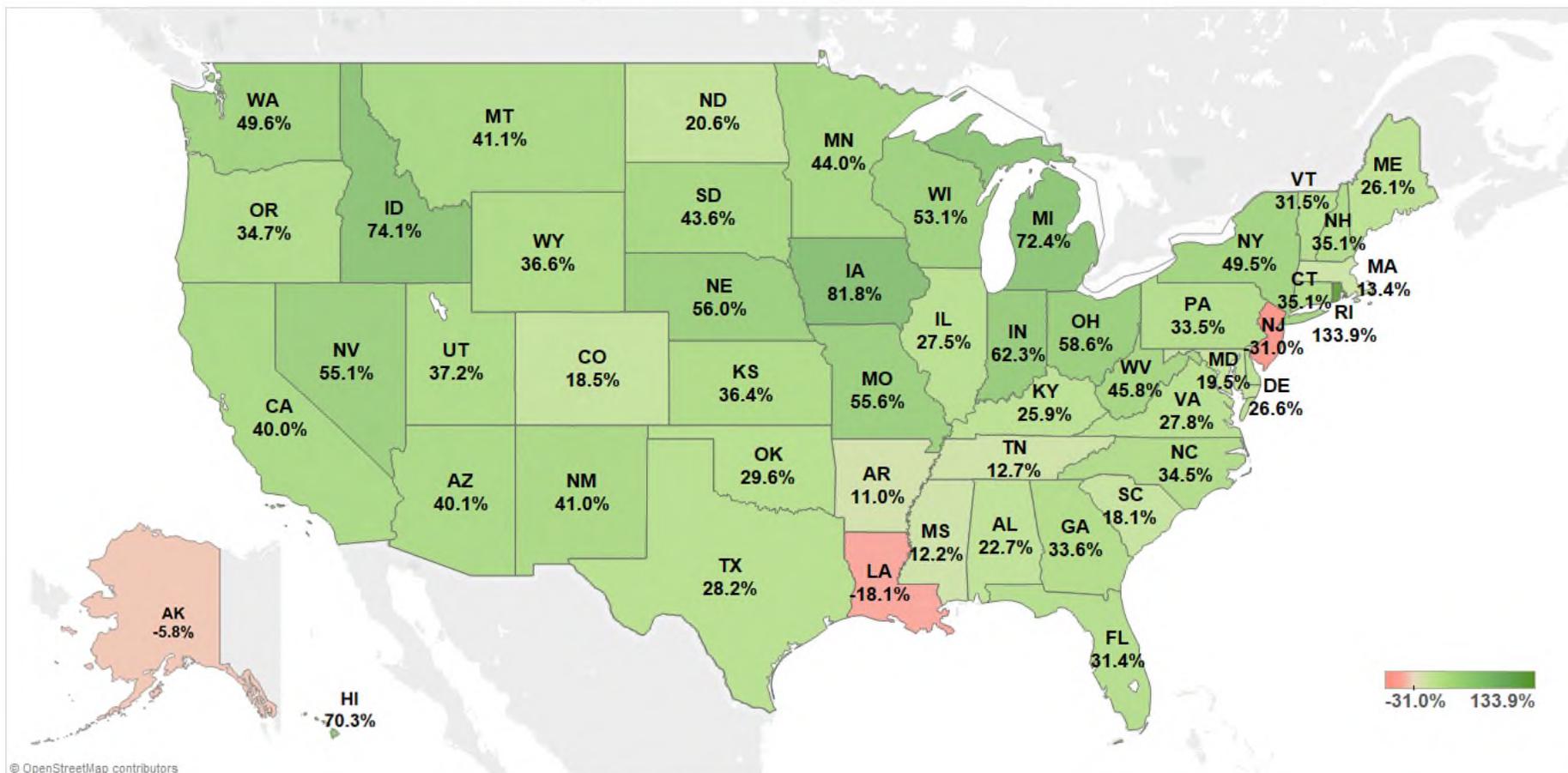


Figure 8, 2004-2014 % Change in Animal Agriculture Income Taxes Paid

Table 1, Estimated 2014 Economic Impact of Animal Agriculture

| State | Output (\$M) | Earnings | Employment | Income Taxes | Property Taxes |
|----------------|--------------|-------------|------------|--------------|----------------|
| ALABAMA | \$ 12,682.0 | \$ 2,201.0 | 76,547 | \$ 557.5 | \$ 47.6 |
| ALASKA | \$ 21.8 | \$ 3.1 | 90 | \$ 0.6 | \$ 1.3 |
| ARIZONA | \$ 4,122.3 | \$ 754.6 | 25,330 | \$ 185.4 | \$ 42.0 |
| ARKANSAS | \$ 15,976.0 | \$ 2,675.2 | 86,072 | \$ 731.1 | \$ 86.7 |
| CALIFORNIA | \$ 27,311.3 | \$ 5,168.7 | 124,322 | \$ 1,531.5 | \$ 827.6 |
| COLORADO | \$ 10,383.4 | \$ 1,896.3 | 69,471 | \$ 473.3 | \$ 96.2 |
| CONNECTICUT | \$ 385.5 | \$ 64.4 | 2,474 | \$ 16.6 | \$ 29.5 |
| DELAWARE | \$ 2,262.0 | \$ 325.5 | 7,466 | \$ 84.2 | \$ 6.2 |
| FLORIDA | \$ 3,836.9 | \$ 698.6 | 20,782 | \$ 142.0 | \$ 189.3 |
| GEORGIA | \$ 17,483.6 | \$ 3,174.3 | 76,948 | \$ 835.8 | \$ 131.7 |
| HAWAII | \$ 258.0 | \$ 43.5 | 1,614 | \$ 12.4 | \$ 11.6 |
| IDAHO | \$ 11,786.3 | \$ 2,030.4 | 59,108 | \$ 563.0 | \$ 78.9 |
| ILLINOIS | \$ 6,570.1 | \$ 1,187.2 | 28,184 | \$ 300.7 | \$ 321.3 |
| INDIANA | \$ 9,379.8 | \$ 1,609.8 | 48,865 | \$ 382.0 | \$ 260.7 |
| IOWA | \$ 30,070.7 | \$ 4,974.7 | 128,621 | \$ 1,405.3 | \$ 437.3 |
| KANSAS | \$ 16,278.1 | \$ 2,589.5 | 75,643 | \$ 653.3 | \$ 227.6 |
| KENTUCKY | \$ 7,667.7 | \$ 1,298.5 | 38,850 | \$ 339.3 | \$ 113.7 |
| LOUISIANA | \$ 1,390.1 | \$ 240.3 | 8,446 | \$ 58.5 | \$ 32.1 |
| MAINE | \$ 865.6 | \$ 153.3 | 5,936 | \$ 43.4 | \$ 30.7 |
| MARYLAND | \$ 2,591.9 | \$ 427.4 | 15,608 | \$ 107.2 | \$ 48.4 |
| MASSACHUSETTS | \$ 225.4 | \$ 38.5 | 1,504 | \$ 9.9 | \$ 38.0 |
| MICHIGAN | \$ 7,822.3 | \$ 1,428.3 | 46,481 | \$ 351.1 | \$ 217.5 |
| MINNESOTA | \$ 20,171.6 | \$ 3,567.6 | 88,167 | \$ 976.8 | \$ 340.7 |
| MISSISSIPPI | \$ 10,270.7 | \$ 1,717.6 | 50,978 | \$ 435.1 | \$ 78.3 |
| MISSOURI | \$ 14,720.7 | \$ 2,484.2 | 93,989 | \$ 654.1 | \$ 193.4 |
| MONTANA | \$ 5,299.0 | \$ 888.4 | 36,614 | \$ 241.9 | \$ 126.6 |
| NEBRASKA | \$ 22,711.1 | \$ 3,626.1 | 95,032 | \$ 985.2 | \$ 479.0 |
| NEVADA | \$ 881.6 | \$ 144.7 | 5,577 | \$ 29.4 | \$ 17.9 |
| NEW HAMPSHIRE | \$ 250.0 | \$ 41.3 | 1,191 | \$ 10.5 | \$ 23.6 |
| NEW JERSEY | \$ 181.7 | \$ 30.9 | 1,012 | \$ 8.0 | \$ 55.3 |
| NEW MEXICO | \$ 5,729.9 | \$ 979.7 | 27,992 | \$ 247.2 | \$ 36.2 |
| NEW YORK | \$ 6,889.0 | \$ 1,160.0 | 37,792 | \$ 310.7 | \$ 208.9 |
| NORTH CAROLINA | \$ 21,105.5 | \$ 3,784.5 | 96,077 | \$ 1,034.3 | \$ 142.4 |
| NORTH DAKOTA | \$ 3,452.1 | \$ 550.0 | 14,139 | \$ 127.3 | \$ 129.9 |
| OHIO | \$ 9,254.7 | \$ 1,666.5 | 52,927 | \$ 407.3 | \$ 235.7 |
| OKLAHOMA | \$ 14,590.9 | \$ 2,481.3 | 94,529 | \$ 634.7 | \$ 114.3 |
| OREGON | \$ 4,395.8 | \$ 768.7 | 31,382 | \$ 225.5 | \$ 112.8 |
| PENNSYLVANIA | \$ 11,227.9 | \$ 2,029.3 | 75,408 | \$ 474.9 | \$ 229.9 |
| RHODE ISLAND | \$ 53.7 | \$ 8.6 | 267 | \$ 2.2 | \$ 7.4 |
| SOUTH CAROLINA | \$ 3,127.4 | \$ 538.6 | 20,354 | \$ 147.2 | \$ 43.3 |
| SOUTH DAKOTA | \$ 9,114.3 | \$ 1,447.9 | 36,307 | \$ 294.4 | \$ 197.1 |
| TENNESSEE | \$ 3,721.2 | \$ 638.0 | 17,950 | \$ 168.0 | \$ 99.2 |
| TEXAS | \$ 43,201.6 | \$ 7,922.1 | 287,445 | \$ 1,610.6 | \$ 553.9 |
| UTAH | \$ 3,341.7 | \$ 608.7 | 19,682 | \$ 154.2 | \$ 34.0 |
| VERMONT | \$ 1,636.0 | \$ 279.6 | 11,233 | \$ 75.8 | \$ 34.0 |
| VIRGINIA | \$ 5,098.2 | \$ 847.3 | 23,748 | \$ 221.0 | \$ 110.2 |
| WASHINGTON | \$ 6,725.2 | \$ 1,208.9 | 32,469 | \$ 245.8 | \$ 175.1 |
| WEST VIRGINIA | \$ 1,059.5 | \$ 165.3 | 4,939 | \$ 43.5 | \$ 21.0 |
| WISCONSIN | \$ 20,543.4 | \$ 3,738.2 | 145,500 | \$ 1,003.0 | \$ 311.2 |
| WYOMING | \$ 2,595.4 | \$ 391.8 | 12,418 | \$ 79.6 | \$ 41.6 |
| US Total | \$ 440,720.5 | \$ 76,698.8 | 2,363,477 | \$ 19,632.2 | \$ 7,428.9 |

Table 2, Economic Impact of Animal Agriculture: Change from 2004-2014

| State | Output (\$1,000) | Earnings (\$1,000) | Employment | Income Taxes (\$1,000) |
|----------------|------------------|--------------------|------------|------------------------|
| ALABAMA | \$ 2,347,869 | \$ 406,856 | 13,774 | \$ 103,057 |
| ALASKA | \$ (1,039) | \$ (194) | (10) | \$ (39) |
| ARIZONA | \$ 1,170,411 | \$ 215,885 | 7,329 | \$ 53,043 |
| ARKANSAS | \$ 1,593,712 | \$ 265,489 | 8,084 | \$ 72,558 |
| CALIFORNIA | \$ 7,819,489 | \$ 1,477,365 | 35,676 | \$ 437,743 |
| COLORADO | \$ 1,572,022 | \$ 295,457 | 10,636 | \$ 73,746 |
| CONNECTICUT | \$ 101,368 | \$ 16,749 | 619 | \$ 4,326 |
| DELAWARE | \$ 476,361 | \$ 68,375 | 1,556 | \$ 17,695 |
| FLORIDA | \$ 918,284 | \$ 166,860 | 5,075 | \$ 33,923 |
| GEORGIA | \$ 4,395,184 | \$ 799,055 | 19,284 | \$ 210,391 |
| HAWAII | \$ 107,671 | \$ 17,966 | 622 | \$ 5,135 |
| IDAHO | \$ 4,996,955 | \$ 863,954 | 25,132 | \$ 239,574 |
| ILLINOIS | \$ 1,417,101 | \$ 255,792 | 6,059 | \$ 64,792 |
| INDIANA | \$ 3,605,502 | \$ 617,995 | 18,617 | \$ 146,650 |
| IOWA | \$ 13,534,986 | \$ 2,238,815 | 57,872 | \$ 632,465 |
| KANSAS | \$ 4,327,931 | \$ 691,271 | 20,329 | \$ 174,408 |
| KENTUCKY | \$ 1,594,978 | \$ 267,395 | 7,951 | \$ 69,870 |
| LOUISIANA | \$ (293,921) | \$ (53,058) | (1,694) | \$ (12,909) |
| MAINE | \$ 179,551 | \$ 31,718 | 1,217 | \$ 8,970 |
| MARYLAND | \$ 426,650 | \$ 69,672 | 2,404 | \$ 17,474 |
| MASSACHUSETTS | \$ 27,752 | \$ 4,556 | 159 | \$ 1,165 |
| MICHIGAN | \$ 3,283,140 | \$ 599,809 | 19,636 | \$ 147,433 |
| MINNESOTA | \$ 6,186,928 | \$ 1,090,668 | 26,985 | \$ 298,625 |
| MISSISSIPPI | \$ 1,126,527 | \$ 187,314 | 5,367 | \$ 47,447 |
| MISSOURI | \$ 5,258,144 | \$ 887,829 | 32,038 | \$ 233,765 |
| MONTANA | \$ 1,546,530 | \$ 258,623 | 10,695 | \$ 70,423 |
| NEBRASKA | \$ 8,177,992 | \$ 1,302,349 | 34,171 | \$ 353,848 |
| NEVADA | \$ 310,855 | \$ 51,370 | 1,959 | \$ 10,444 |
| NEW HAMPSHIRE | \$ 66,301 | \$ 10,739 | 294 | \$ 2,720 |
| NEW JERSEY | \$ (81,827) | \$ (13,865) | (397) | \$ (3,591) |
| NEW MEXICO | \$ 1,664,590 | \$ 284,693 | 8,144 | \$ 71,828 |
| NEW YORK | \$ 2,301,887 | \$ 384,220 | 12,494 | \$ 102,894 |
| NORTH CAROLINA | \$ 5,414,084 | \$ 969,961 | 24,246 | \$ 265,090 |
| NORTH DAKOTA | \$ 596,415 | \$ 94,022 | 2,404 | \$ 21,766 |
| OHIO | \$ 3,426,311 | \$ 615,527 | 19,308 | \$ 150,429 |
| OKLAHOMA | \$ 3,351,381 | \$ 566,437 | 21,585 | \$ 144,895 |
| OREGON | \$ 1,130,772 | \$ 197,955 | 8,344 | \$ 58,060 |
| PENNSYLVANIA | \$ 2,828,344 | \$ 508,668 | 18,385 | \$ 119,028 |
| RHODE ISLAND | \$ 30,912 | \$ 4,911 | 158 | \$ 1,232 |
| SOUTH CAROLINA | \$ 479,358 | \$ 82,408 | 3,009 | \$ 22,522 |
| SOUTH DAKOTA | \$ 2,759,447 | \$ 439,761 | 11,045 | \$ 89,403 |
| TENNESSEE | \$ 432,123 | \$ 72,031 | 2,026 | \$ 18,966 |
| TEXAS | \$ 9,392,126 | \$ 1,744,078 | 63,914 | \$ 354,571 |
| UTAH | \$ 894,025 | \$ 164,879 | 5,357 | \$ 41,764 |
| VERMONT | \$ 396,815 | \$ 67,023 | 2,656 | \$ 18,183 |
| VIRGINIA | \$ 1,113,841 | \$ 184,169 | 5,154 | \$ 48,031 |
| WASHINGTON | \$ 2,225,287 | \$ 400,953 | 10,757 | \$ 81,514 |
| WEST VIRGINIA | \$ 337,267 | \$ 51,952 | 1,571 | \$ 13,679 |
| WISCONSIN | \$ 7,164,928 | \$ 1,295,820 | 50,300 | \$ 347,669 |
| WYOMING | \$ 694,216 | \$ 105,065 | 3,334 | \$ 21,360 |
| US Total | \$ 122,827,539 | \$ 21,327,346 | 645,629 | \$ 5,508,036 |

U.S. Total Animal Agriculture Soybean Meal Consumption

Soybean meal consumption in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Decision Innovation Solutions (DIS) used the input from these conversations along with additional analysis to estimate the quantity of soybean meal used during the 2013-14 soybean marketing year by sixteen specific animal species.

The three segments of animal agriculture that consume the most soybean meal are: Broilers (11.2 million tons), Hogs (7.9 million tons), and Dairy Cows (2.7 million). Total soybean meal consumption in the U.S. during 2014 was an estimated 27.9 million tons.

Though this report's methodology used a "bottom up" approach, it is interesting to note that USDA's method of tracking soybean meal actually tracks both soybean meal and soybean hulls. If one factors in that soybean hulls comprise 4-5 percent of soy solids, the number developed for this report and the number used by USDA appear to reflect well on each other.

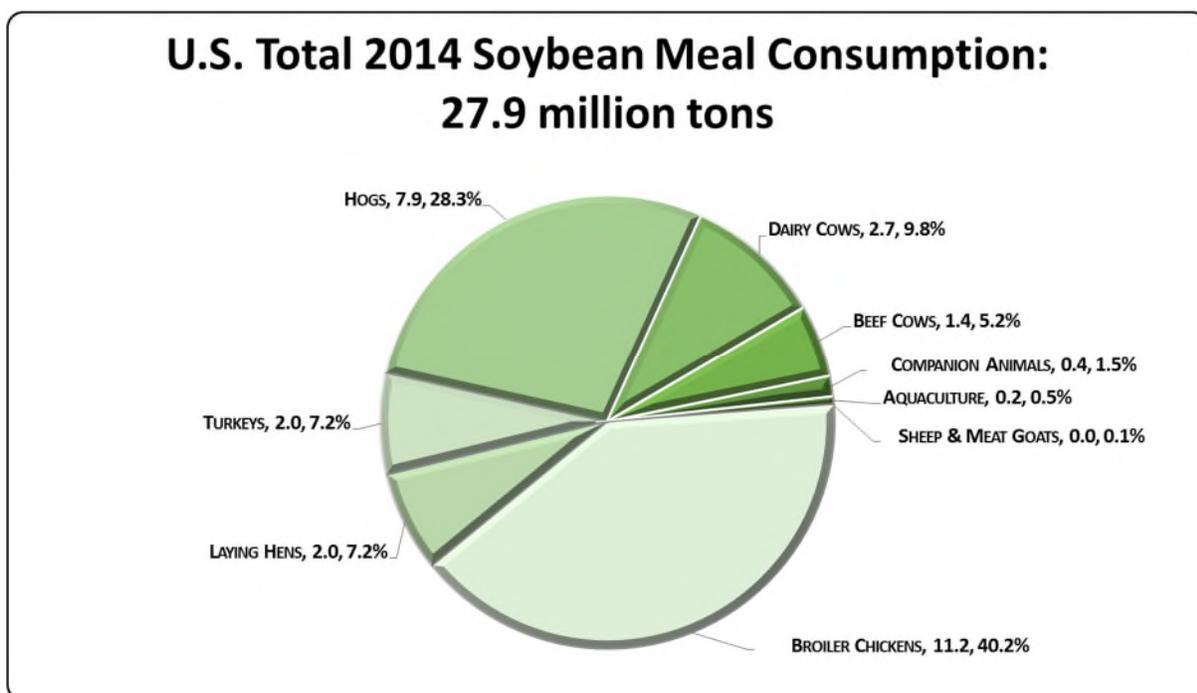


Figure 9, U.S. Total 2014 Soybean Meal Consumption

Due to the large number of animal units, Iowa is a clear leader in soybean meal usage. Other states that use large amounts of soybean meal include North Carolina, Georgia, Arkansas, Alabama, Minnesota and Texas. Detailed results for all species including the breakdown of companion animals and aquaculture can be found in Table 3 on page 32.

SBM Usage: State Totals (2014)

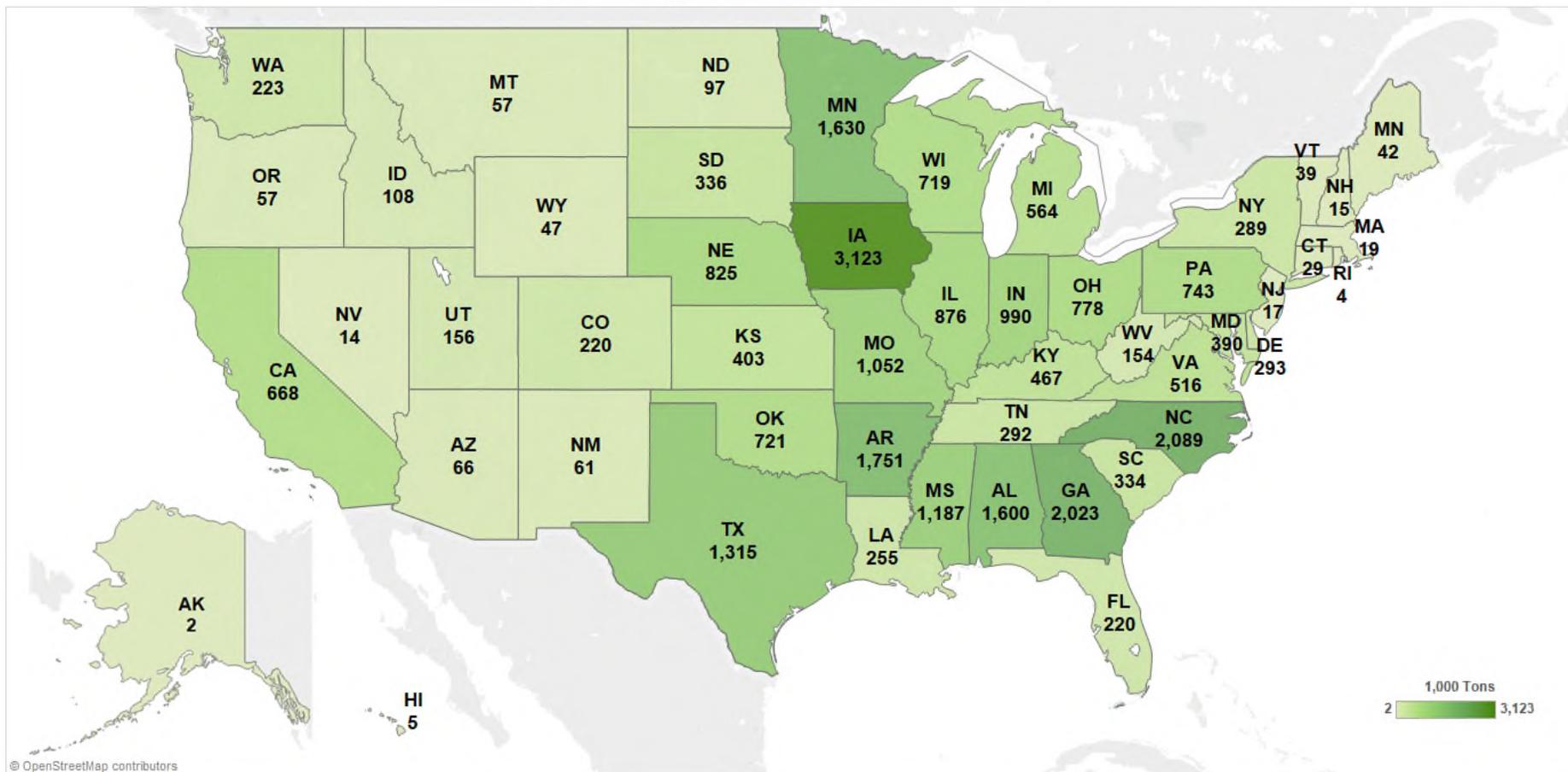


Figure 10, SBM Usage: State Totals (2014)

Georgia’s broiler chickens consumed nearly 1.9 million tons of soybean meal in 2014. Other states that use significant amounts of soybean meal in their broiler diets include Alabama, Arkansas, Mississippi and North Carolina.

SBM Usage: Broiler Chickens (2014)

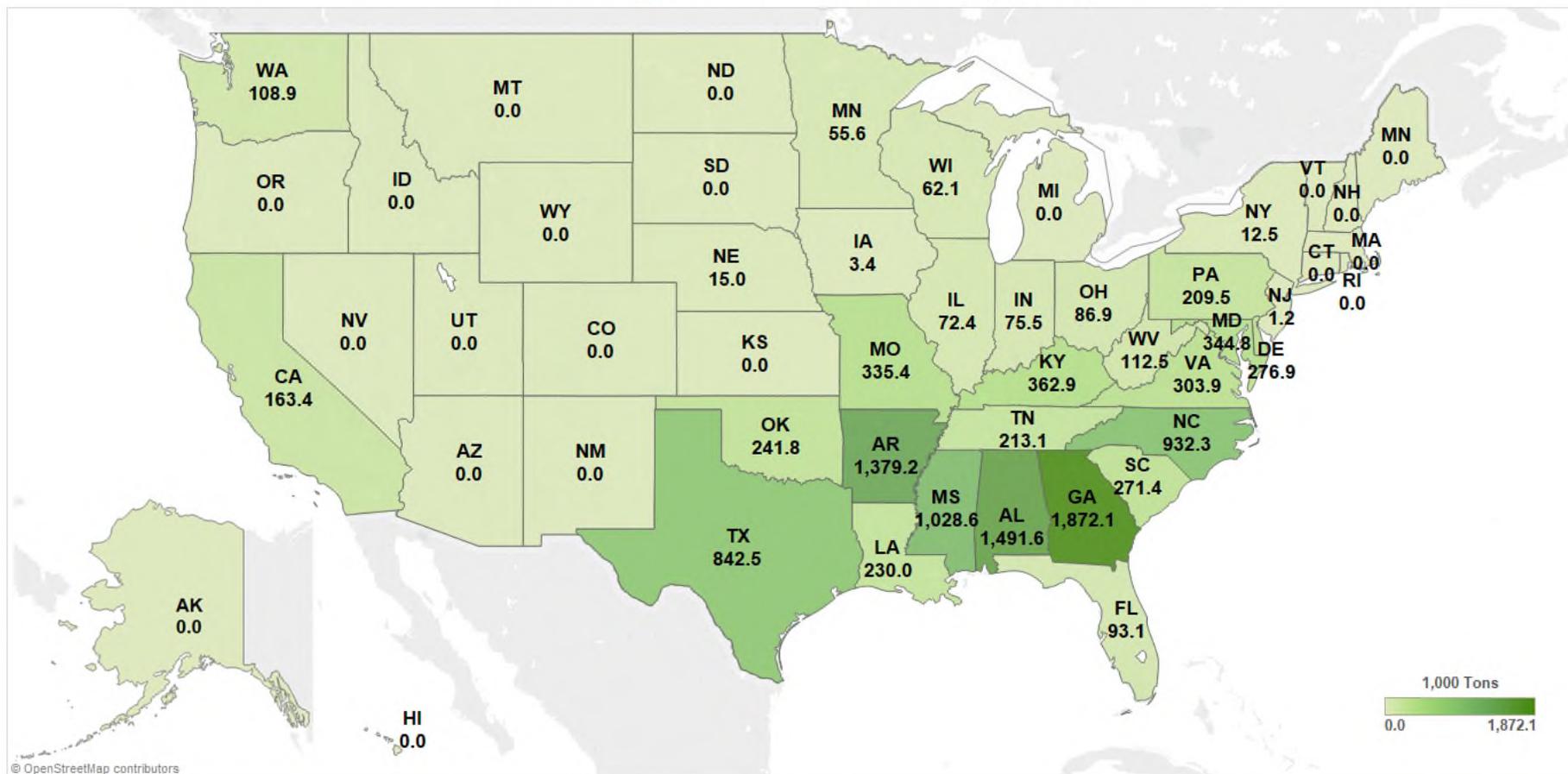


Figure 11, SBM Usage: Broiler Chickens (2014)

Iowa leads the nation in hog production and the state’s hogs consumed about 2.3 million tons of soybean meal in 2014. Hogs in Minnesota, North Carolina and Illinois consumed large amounts of soybean meal too.

SBM Usage: Hogs (2014)

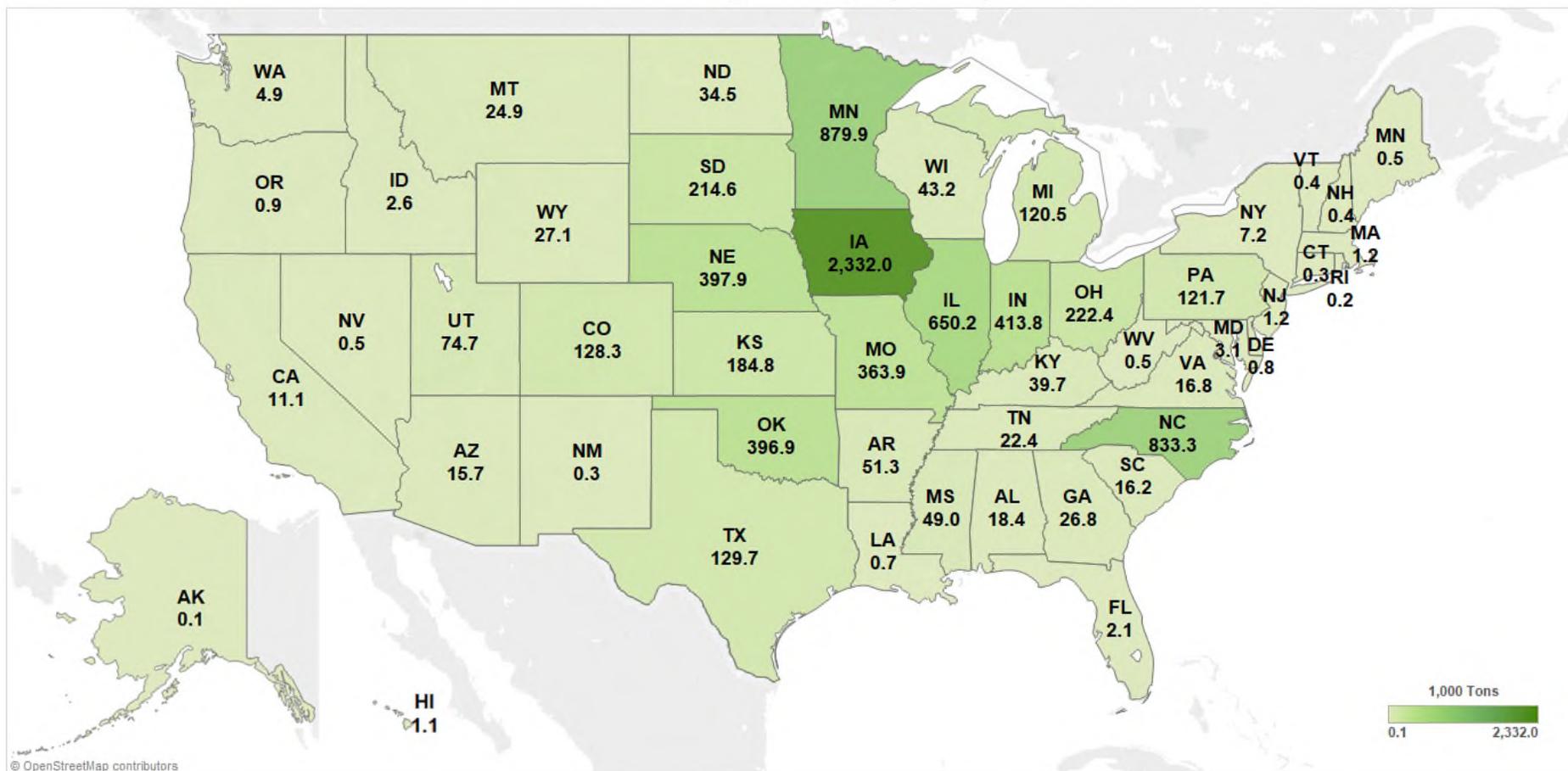


Figure 14, SBM Usage: Hogs (2014)

Wisconsin's dairy cows consumed nearly 486,000 tons of soybean meal in 2014. Dairy cows in Michigan, California and New York also consumed a large amount of soybean meal.

SBM Usage: Dairy Cows (2014)

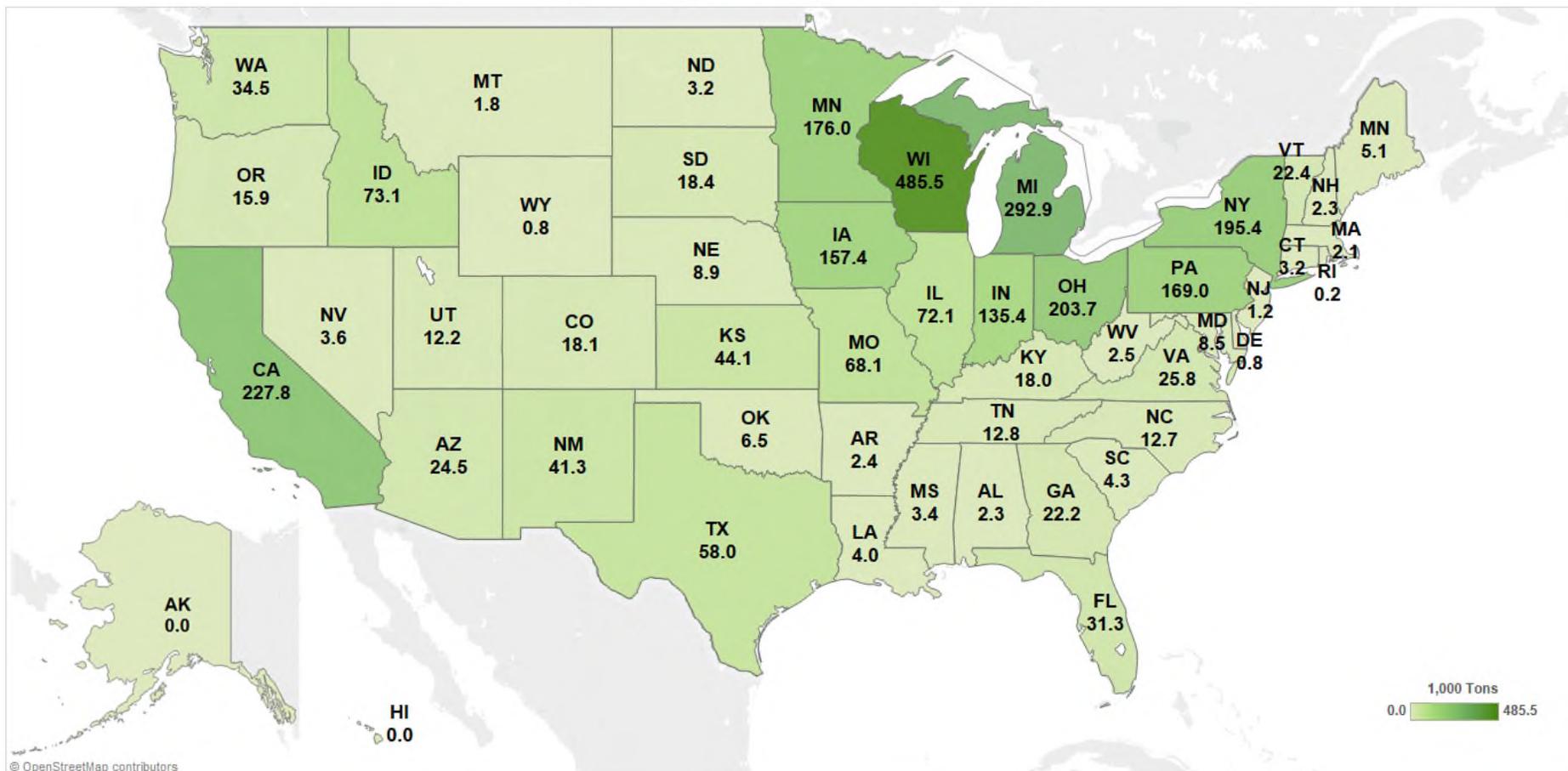


Figure 15, SBM Usage: Dairy Cows (2014)

Nebraska’s beef cows consumed over 334,000 tons of soybean meal in 2014. Beef cows in Iowa, Kansas and Texas also consumed over 100,000 tons of soybean meal each.

SBM Usage: Beef Cows (2014)

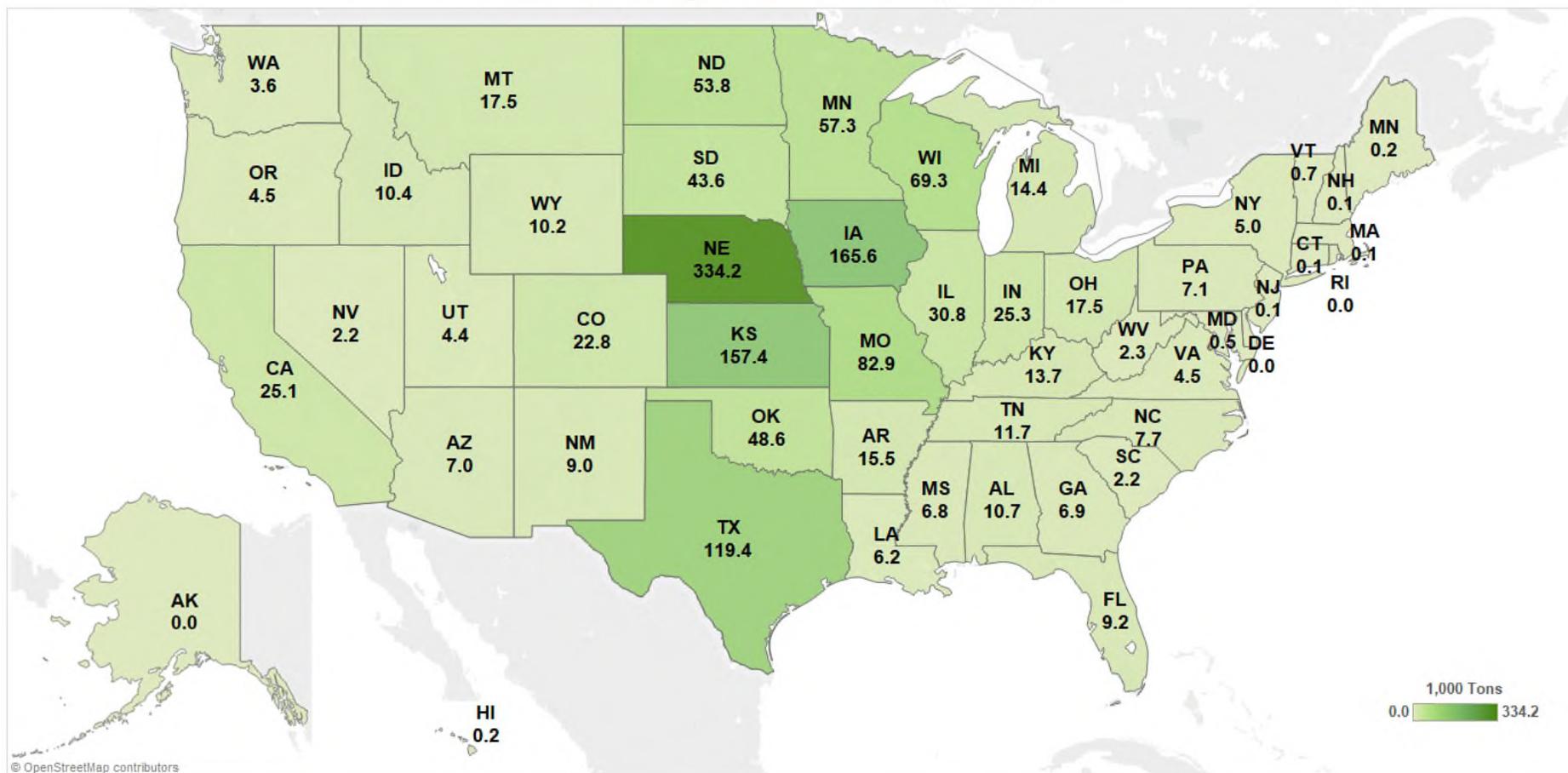


Figure 16, SBM Usage: Beef Cows (2014)

California was the leading state in soybean meal usage for companion animals with about 38,000 tons in 2014. Texas and Florida also contributed significant amounts with 23,900 and 34,900 tons, respectively. The companion animals considered in this report include dogs, cats and horses.

SBM Usage: Companion Animals (2014)

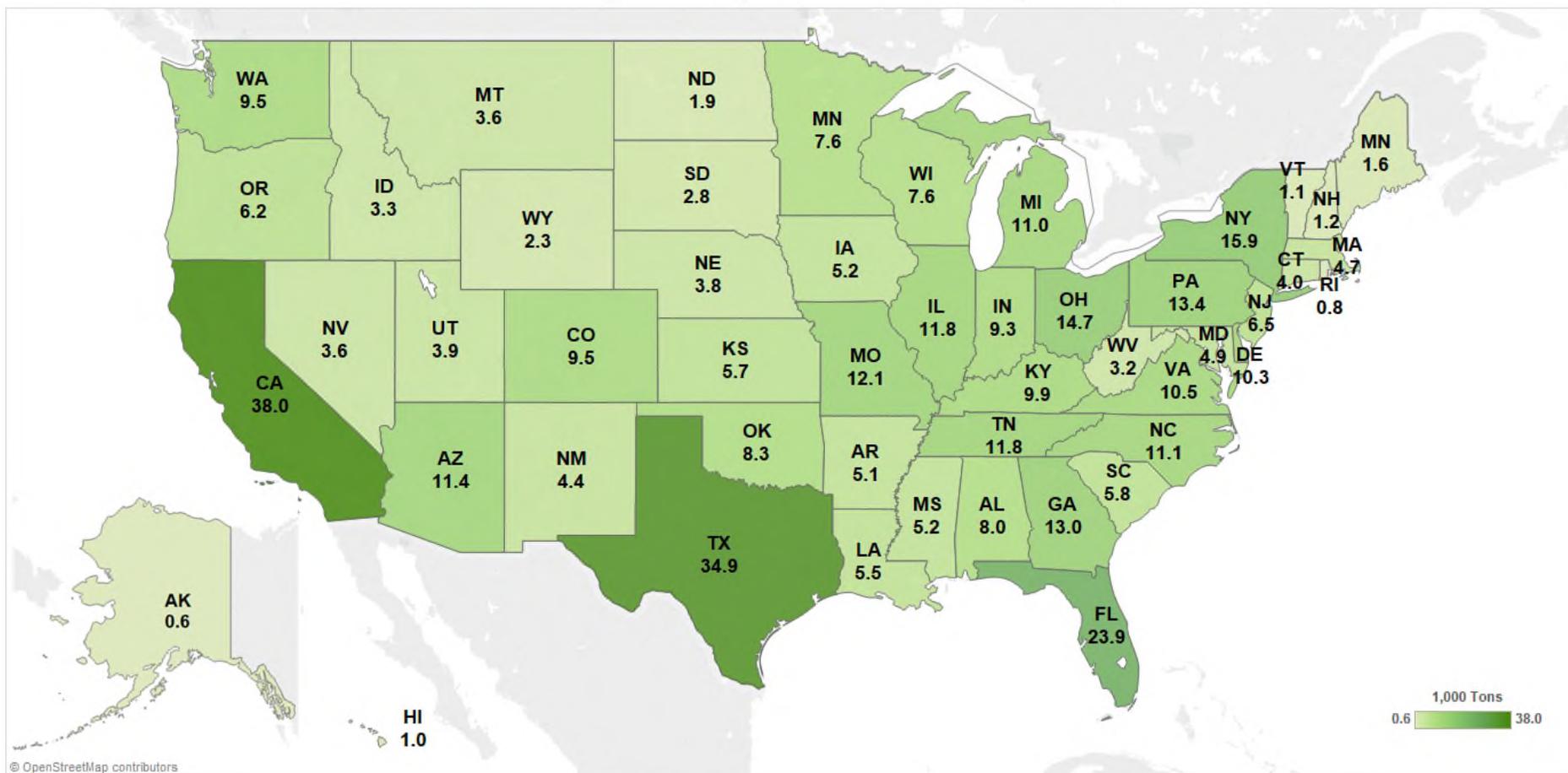


Figure 17, SBM Usage: Companion Animals (2014)

Mississippi and Alabama consumed the majority of soybean meal in the aquaculture category. This study includes catfish, trout, tilapia, hybrid striped bass and shrimp in estimates for aquaculture consumption of soybean meal.

SBM Usage: Aquaculture (2014)

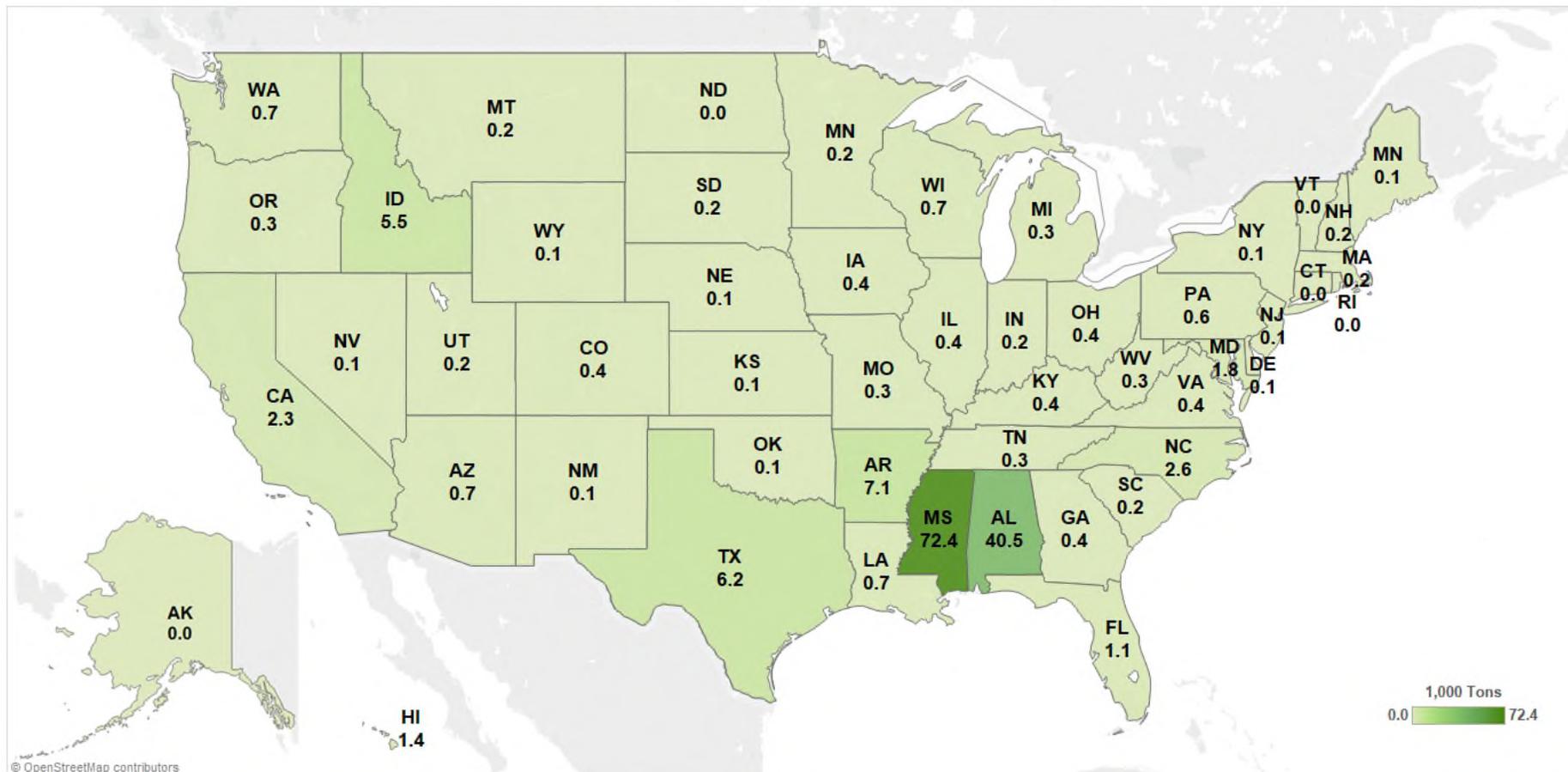


Figure 18, SBM Usage: Aquaculture (2014)

Many states across the West and Midwest used about 1,000 to 2,000 short tons of soybean meal for sheep production in 2014.

SBM Usage: Sheep (2014)

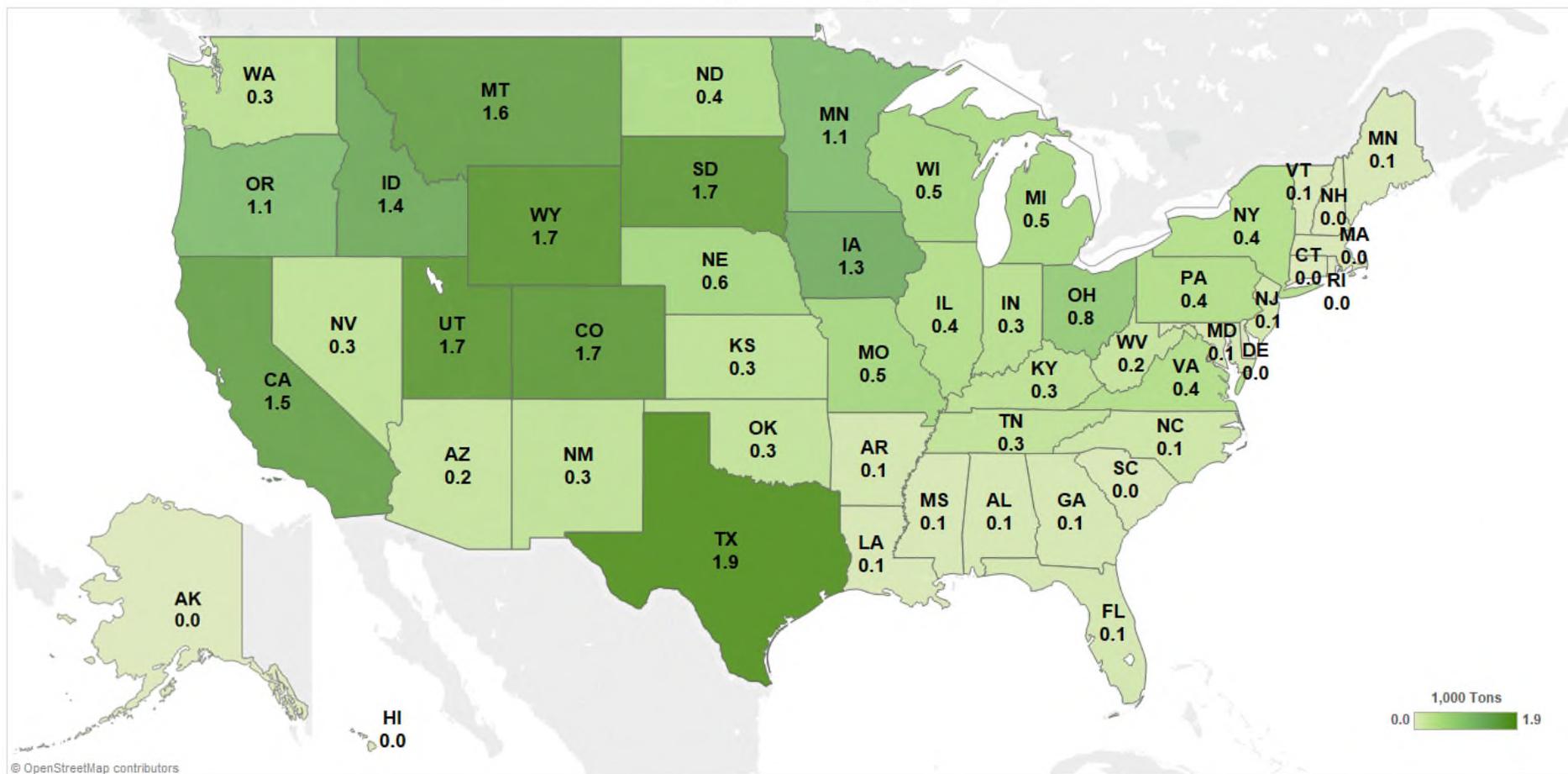


Figure 19, SBM Usage: Sheep (2014)

Texas had the most soybean meal usage in meat goats with about 71 tons. Overall, soybean meal usage for meat goats is minimal in most states across the U.S.

SBM Usage: Meat Goats (2014)

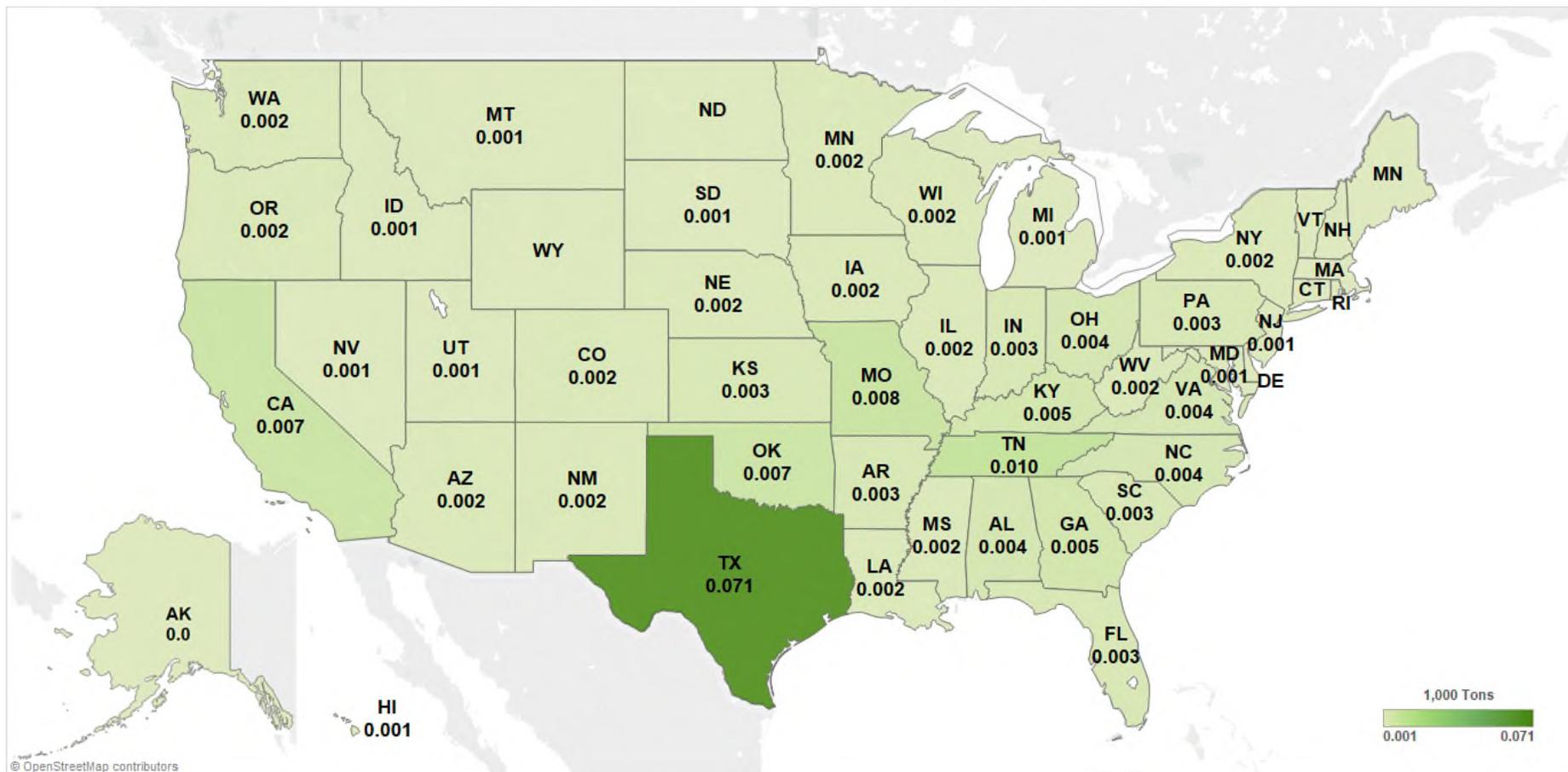


Figure 20, SBM Usage: Meat Goats (2014)

Table 3, Total Soybean Meal Use by State (Short Tons)

| State | Broilers | Turkeys | Layers | Hogs | Dairy Cows | Beef Cows | Sheep | Meat Goats | Cats | Dogs | Horses | Companion Animals | Catfish | Trout | Tilapia | Hybrid Striped Bass | Shrimp | Aquaculture | State Total |
|----------------|------------|-----------|-----------|-----------|------------|-----------|--------|------------|--------|---------|---------|-------------------|---------|--------|---------|---------------------|--------|-------------|-------------|
| Alabama | 1,491,584 | 4,697 | 23,273 | 18,357 | 2,338 | 10,680 | 76 | 4 | 533 | 3,640 | 3,791 | 7,964 | 40,122 | 0 | 258 | 38 | 111 | 40,528 | 1,599,502 |
| Alaska | - | 1,281 | 241 | 111 | 15 | 5 | 5 | - | 69 | 405 | 161 | 635 | - | 12 | - | - | - | 12 | 2,305 |
| Arizona | - | 2,508 | 4,192 | 15,732 | 24,513 | 7,050 | 201 | 2 | 617 | 4,971 | 5,861 | 11,448 | - | 38 | 601 | 38 | - | 678 | 66,325 |
| Arkansas | 1,379,248 | 254,238 | 36,092 | 51,292 | 2,381 | 15,522 | 88 | 3 | 340 | 2,961 | 1,848 | 5,149 | 6,901 | 123 | 7 | 76 | - | 7,107 | 1,751,119 |
| California | 163,390 | 93,221 | 105,948 | 11,074 | 227,850 | 25,130 | 1,536 | 7 | 2,827 | 17,016 | 18,125 | 37,968 | 909 | 695 | 605 | 76 | - | 2,285 | 668,408 |
| Colorado | - | 10,247 | 28,644 | 128,334 | 18,081 | 22,843 | 1,678 | 2 | 514 | 3,597 | 5,409 | 9,520 | 105 | 241 | 45 | 57 | - | 448 | 219,798 |
| Connecticut | - | 6,458 | 14,536 | 326 | 3,218 | 131 | 27 | - | 326 | 1,273 | 2,432 | 4,031 | - | 29 | - | - | - | 29 | 28,756 |
| Delaware | 276,919 | 320 | 3,422 | 757 | 822 | 39 | 7 | - | 80 | 407 | 9,857 | 10,344 | - | - | 45 | 19 | - | 64 | 292,695 |
| Florida | 93,084 | 6,725 | 52,541 | 2,120 | 31,339 | 9,161 | 95 | 3 | 1,882 | 11,383 | 10,630 | 23,894 | 22 | 6 | 467 | 50 | 517 | 1,062 | 220,025 |
| Georgia | 1,872,121 | 4,110 | 77,359 | 26,827 | 22,158 | 6,866 | 75 | 5 | 930 | 6,656 | 5,463 | 13,049 | 67 | 79 | 136 | - | 115 | 397 | 2,022,967 |
| Hawaii | - | - | 893 | 1,052 | 47 | 207 | 23 | 1 | 101 | 610 | 336 | 1,048 | 74 | - | 66 | - | 1,225 | 1,364 | 4,634 |
| Idaho | - | 6,992 | 5,129 | 2,566 | 73,134 | 10,420 | 1,385 | 1 | 160 | 941 | 2,156 | 3,257 | 35 | 5,312 | 189 | - | - | 5,536 | 108,419 |
| Illinois | 72,355 | 9,607 | 28,089 | 650,219 | 72,101 | 30,754 | 399 | 2 | 1,001 | 5,988 | 4,820 | 11,809 | 8 | 51 | 227 | 24 | 57 | 368 | 875,703 |
| Indiana | 75,497 | 161,017 | 169,538 | 413,818 | 135,428 | 25,279 | 341 | 3 | 806 | 4,292 | 4,218 | 9,316 | 2 | 29 | 136 | - | - | 167 | 990,405 |
| Iowa | 3,377 | 88,983 | 368,410 | 2,331,995 | 157,364 | 165,629 | 1,326 | 2 | 320 | 1,568 | 3,292 | 5,181 | 76 | 62 | 91 | 19 | 115 | 362 | 3,122,629 |
| Kansas | - | 4,537 | 6,453 | 184,801 | 44,057 | 157,351 | 289 | 3 | 303 | 2,061 | 3,351 | 5,715 | 72 | - | 45 | 19 | - | 136 | 403,343 |
| Kentucky | 362,855 | 7,846 | 14,699 | 39,718 | 18,023 | 13,653 | 313 | 5 | 565 | 4,020 | 5,291 | 9,876 | 332 | 50 | 11 | 19 | 17 | 429 | 467,416 |
| Louisiana | 229,959 | 2,295 | 6,060 | 732 | 3,990 | 6,198 | 52 | 2 | 356 | 2,804 | 2,300 | 5,460 | 194 | - | - | - | 516 | 710 | 255,459 |
| Maine | - | 12,596 | 22,183 | 521 | 5,081 | 213 | 53 | - | 208 | 779 | 570 | 1,558 | - | 100 | - | - | - | 100 | 42,305 |
| Maryland | 344,799 | 6,245 | 20,463 | 3,079 | 8,469 | 491 | 78 | 1 | 732 | 2,348 | 1,806 | 4,887 | 1,646 | 12 | 91 | - | 57 | 1,806 | 390,317 |
| Massachusetts | - | 7,686 | 3,064 | 1,177 | 2,075 | 124 | 47 | - | 658 | 2,207 | 1,842 | 4,707 | - | 40 | 91 | - | 57 | 189 | 19,068 |
| Michigan | - | 43,220 | 81,749 | 120,476 | 292,856 | 14,429 | 486 | 1 | 1,018 | 5,261 | 4,689 | 10,969 | 142 | 54 | 91 | - | - | 287 | 564,474 |
| Minnesota | 55,556 | 385,594 | 66,286 | 879,905 | 175,992 | 57,317 | 1,052 | 2 | 535 | 2,417 | 4,689 | 7,641 | - | 31 | 136 | - | 57 | 224 | 1,629,569 |
| Mississippi | 1,028,609 | 1,975 | 19,079 | 49,031 | 3,439 | 6,811 | 53 | 2 | 279 | 2,158 | 2,783 | 5,220 | 72,357 | - | 45 | 19 | 5 | 72,426 | 1,186,644 |
| Missouri | 335,394 | 144,068 | 44,297 | 363,941 | 68,091 | 82,883 | 549 | 8 | 681 | 5,240 | 6,159 | 12,081 | 51 | 200 | 91 | - | 0 | 342 | 1,051,654 |
| Montana | - | 3,629 | 3,828 | 24,899 | 1,787 | 17,482 | 1,563 | 1 | 116 | 743 | 2,773 | 3,633 | - | 158 | - | - | - | 158 | 56,980 |
| Nebraska | 14,953 | 5,284 | 59,722 | 397,266 | 8,879 | 334,199 | 577 | 2 | 207 | 943 | 2,628 | 3,778 | 1 | 91 | - | - | - | 92 | 825,411 |
| Nevada | - | 2,722 | 1,273 | 503 | 3,637 | 2,163 | 281 | 1 | 270 | 1,574 | 1,779 | 3,623 | - | 58 | - | - | - | 58 | 14,262 |
| New Hampshire | - | 8,219 | 2,234 | 407 | 2,329 | 96 | 35 | - | 132 | 572 | 483 | 1,187 | - | 220 | - | - | 2 | 222 | 14,730 |
| New Jersey | 1,193 | 3,843 | 2,345 | 1,166 | 1,186 | 69 | 112 | 1 | 609 | 3,524 | 2,333 | 6,466 | 37 | 95 | - | - | - | 132 | 16,511 |
| New Mexico | - | 2,669 | 3,018 | 258 | 41,314 | 8,966 | 274 | 2 | 228 | 1,930 | 2,255 | 4,413 | - | 70 | 45 | - | - | 115 | 61,028 |
| New York | 12,541 | 22,790 | 29,867 | 7,241 | 195,441 | 4,957 | 397 | 2 | 1,789 | 8,073 | 6,024 | 15,886 | 2 | 99 | 12 | 19 | - | 131 | 289,254 |
| North Carolina | 932,348 | 241,526 | 47,664 | 833,330 | 12,663 | 7,675 | 147 | 4 | 947 | 6,657 | 3,487 | 11,091 | 1,255 | 527 | 398 | 383 | 3 | 2,566 | 2,089,015 |
| North Dakota | - | 1,708 | 1,434 | 34,531 | 3,158 | 53,843 | 446 | 0 | 62 | 357 | 1,508 | 1,927 | - | 6 | - | - | - | 6 | 97,053 |
| Ohio | 86,851 | 43,220 | 188,795 | 222,364 | 203,714 | 17,495 | 797 | 4 | 1,622 | 7,133 | 5,935 | 14,690 | 15 | 37 | 318 | 57 | 2 | 429 | 778,359 |
| Oklahoma | 241,792 | 4,643 | 14,222 | 396,895 | 6,507 | 48,582 | 251 | 7 | 428 | 3,537 | 4,357 | 8,321 | 74 | 6 | 45 | - | - | 125 | 721,345 |
| Oregon | - | 14,517 | 14,008 | 875 | 15,862 | 4,492 | 1,051 | 2 | 498 | 2,453 | 3,290 | 6,241 | 4 | 234 | 91 | - | - | 328 | 57,377 |
| Pennsylvania | 209,468 | 66,990 | 153,848 | 121,711 | 168,954 | 7,119 | 404 | 3 | 1,509 | 6,462 | 5,456 | 13,427 | 35 | 463 | 45 | 57 | - | 601 | 742,525 |
| Rhode Island | - | 2,242 | 558 | 221 | 152 | 15 | 8 | - | 88 | 434 | 267 | 789 | - | 29 | - | - | - | 29 | 4,014 |
| South Carolina | 271,420 | 11,689 | 22,447 | 16,226 | 4,265 | 2,166 | 46 | 3 | 433 | 3,122 | 2,266 | 5,821 | 1 | 50 | 91 | 57 | 1 | 199 | 334,283 |
| South Dakota | - | 38,136 | 16,359 | 214,580 | 18,417 | 43,625 | 1,685 | 1 | 118 | 569 | 2,085 | 2,773 | - | 113 | 45 | - | - | 159 | 335,734 |
| Tennessee | 213,131 | 5,818 | 13,438 | 22,401 | 12,800 | 11,660 | 267 | 10 | 751 | 5,844 | 5,253 | 11,848 | 192 | 52 | 91 | - | - | 336 | 291,708 |
| Texas | 842,547 | 20,228 | 102,411 | 129,667 | 58,030 | 119,409 | 1,879 | 71 | 2,342 | 18,950 | 13,645 | 34,937 | 4,455 | 56 | 117 | 1,087 | 520 | 6,236 | 1,315,415 |
| Utah | - | 33,898 | 25,172 | 74,720 | 12,171 | 4,356 | 1,715 | 1 | 187 | 1,062 | 2,682 | 3,931 | - | 191 | - | - | - | 191 | 156,157 |
| Vermont | - | 11,742 | 2,871 | 389 | 22,379 | 731 | 52 | - | 103 | 379 | 627 | 1,109 | - | 35 | - | - | - | 35 | 39,306 |
| Virginia | 303,933 | 142,373 | 10,951 | 16,844 | 25,784 | 4,527 | 395 | 4 | 781 | 4,397 | 5,318 | 10,496 | 137 | 134 | 91 | 1 | 58 | 421 | 515,729 |
| Washington | 108,883 | 15,905 | 44,134 | 4,895 | 34,508 | 3,648 | 308 | 2 | 758 | 4,303 | 4,481 | 9,541 | - | 619 | - | - | 115 | 734 | 222,559 |
| West Virginia | 112,465 | 26,271 | 6,353 | 500 | 2,477 | 2,255 | 230 | 2 | 262 | 1,644 | 1,313 | 3,218 | 88 | 122 | 45 | 38 | - | 293 | 154,064 |
| Wisconsin | 62,064 | 21,349 | 28,845 | 43,171 | 485,524 | 69,317 | 540 | 2 | 648 | 3,001 | 3,916 | 7,565 | 137 | 107 | 410 | - | - | 655 | 719,030 |
| Wyoming | - | 2,508 | 2,260 | 27,077 | 766 | 10,158 | 1,741 | 0 | 57 | 318 | 1,913 | 2,289 | - | 77 | 45 | - | - | 122 | 46,922 |
| U.S. Total | 11,198,335 | 2,020,385 | 2,000,695 | 7,890,757 | 2,735,567 | 1,448,192 | 25,433 | 184 | 30,789 | 182,987 | 197,951 | 411,727 | 129,550 | 10,812 | 5,370 | 2,151 | 3,550 | 151,433 | 27,882,710 |

U.S. Total Animal Unit (AU) Trends

Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the U.S. Due to this reality, using a single year as a measure of the presence and strength of an industry can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to the United States.

As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In the U.S., the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (52.8 million AUs), Broilers (25.6 million AUs), and Hogs (22.3 million AUs). Total animal units in U.S. during 2014 were 118.6 million AUs.

The total animal units map below represents the combined total of all animal units for all species by state. As you can see, Iowa leads the way with over 10 million animal units. Texas and Nebraska follow with 9.46 and 8.45 million total AUs, respectively.

Total AUs by State (2014)

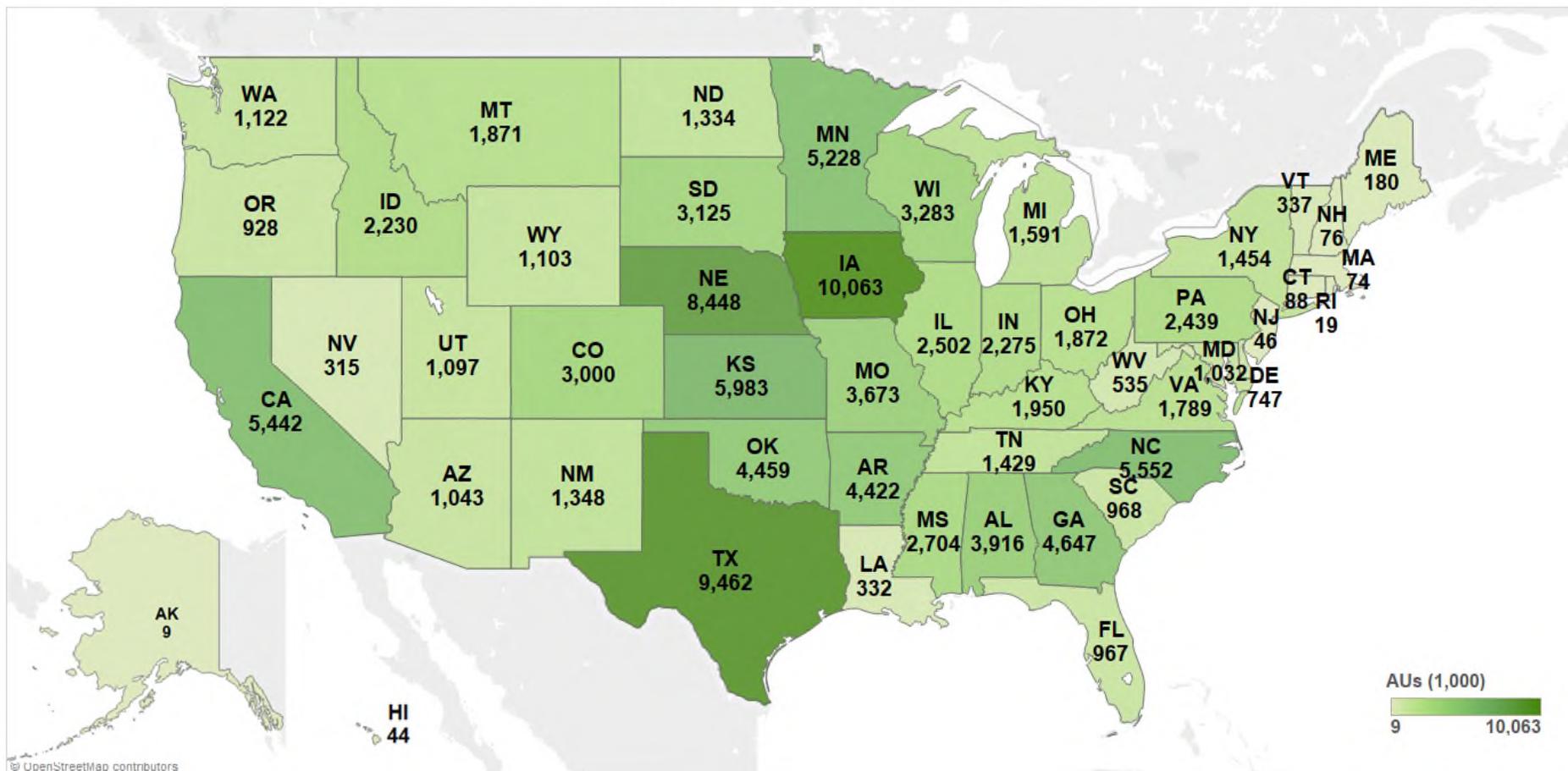


Figure 21, Total AUs by State (2014)

Total animal unit numbers across much of the Midwest have seen steady increases from 2004 to 2014, however many states across the southern part of the U.S. saw declines in total animal units over this time frame. The drought that began in 2011 across Texas and nearby states forced many cattle producers to downsize their herd, sending some cattle production further north.

Change from 2004 to 2014 in Total AUs

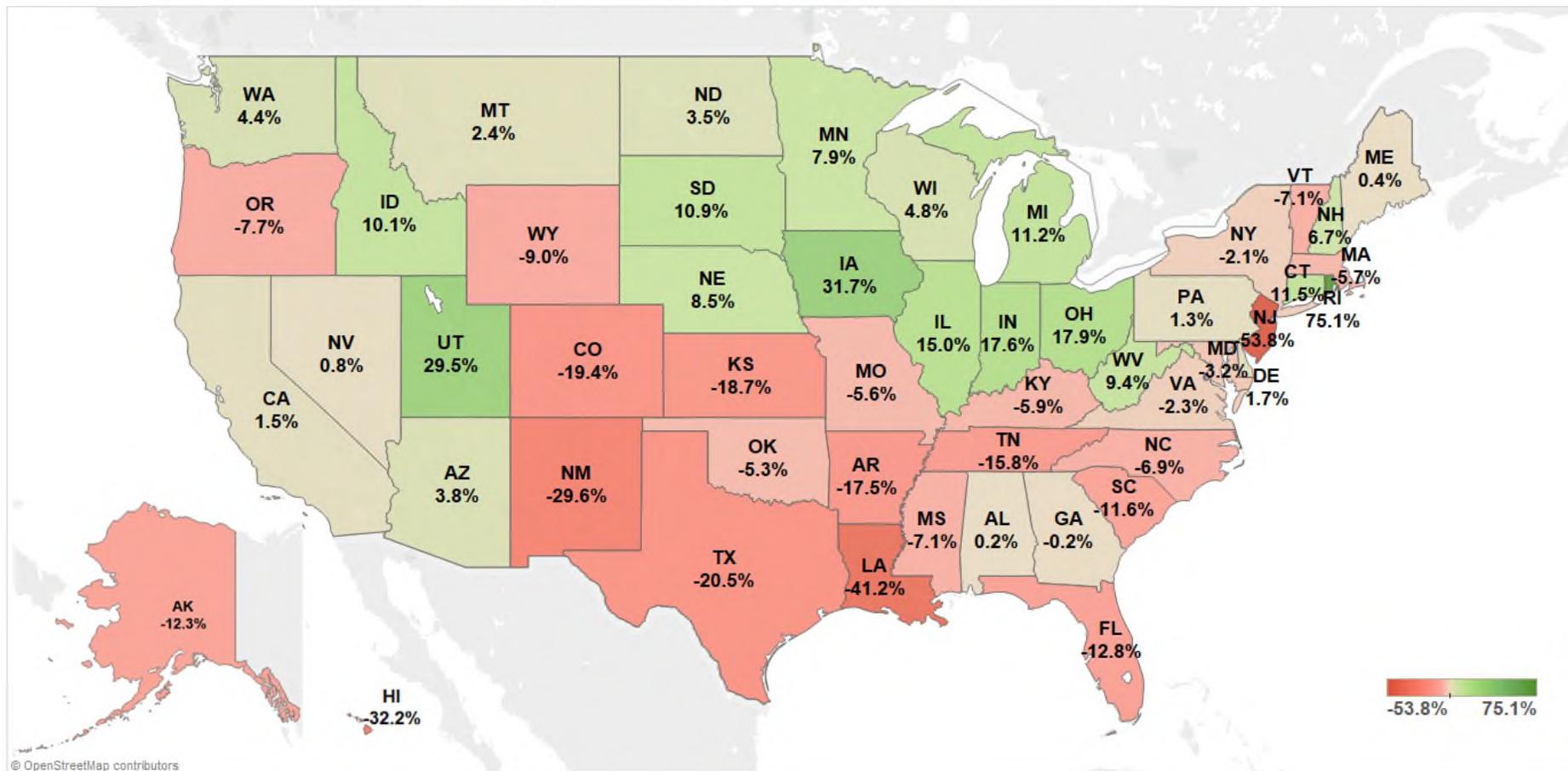


Figure 22, Change from 2004 to 2014 in Total AUs

This chart shows that U.S. broiler chickens are heavily concentrated in the southeastern states like Georgia, Alabama, and North Carolina. Around 15.5% of the nation’s broiler chickens were in Georgia, which is nearly 4 million broiler animal units in the state.

Broiler Chicken AUs by State (2014)

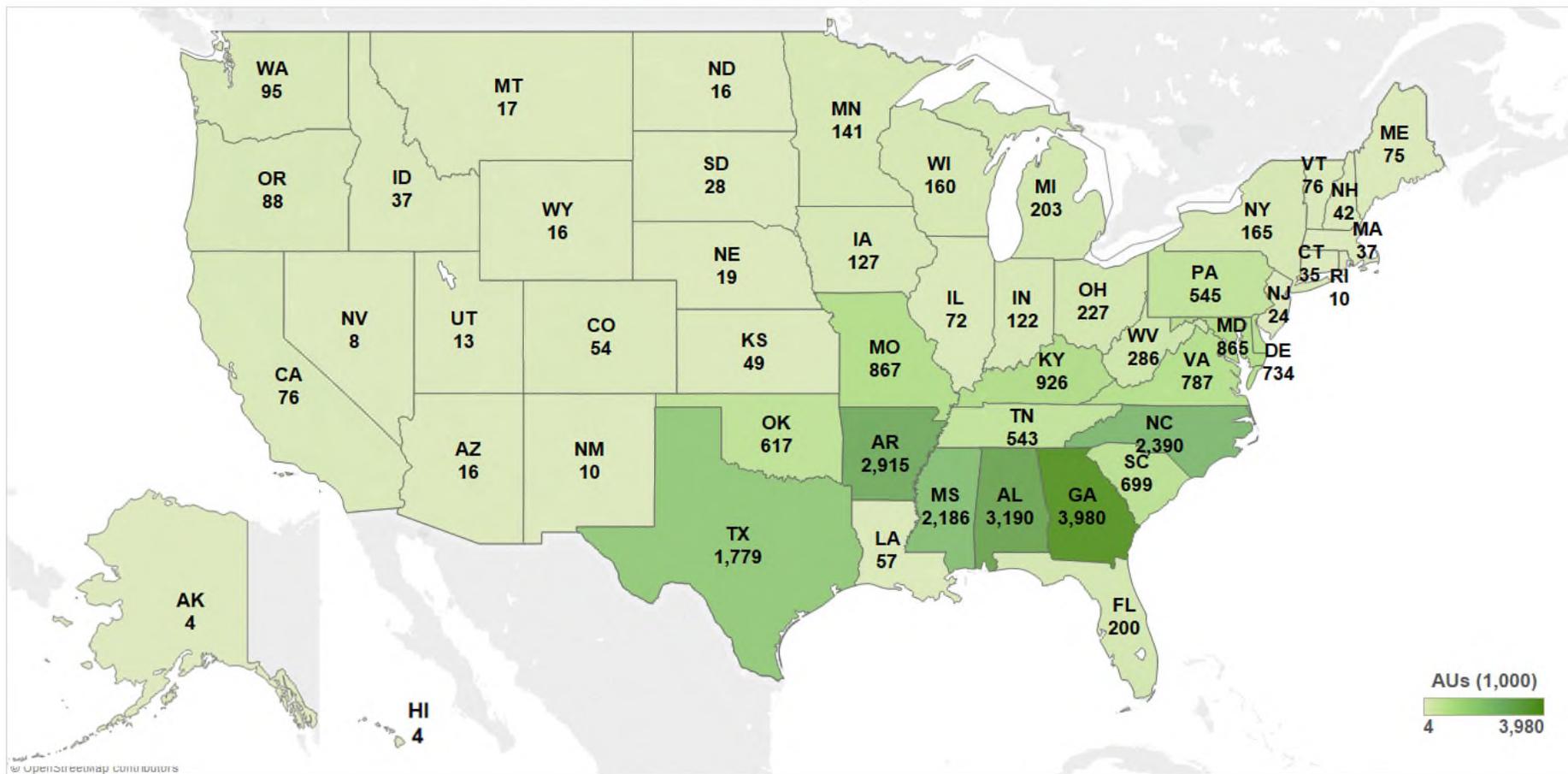


Figure 23, Broiler Chicken AUs by State (2014)

This map shows that many states across the West and Midwest saw a decrease in broiler chicken animal units from 2004 to 2014, but it is important to remember that these states do not have many broilers. States that have high broiler numbers like Georgia and Alabama saw relatively small percentage increases in animal units from 2004 to 2014, even though in real terms the increases were pretty big. However, another state where the broiler sector is relatively large, North Carolina, increased by 13.4%.

Change from 2004 to 2014 in Broiler Chicken AUs

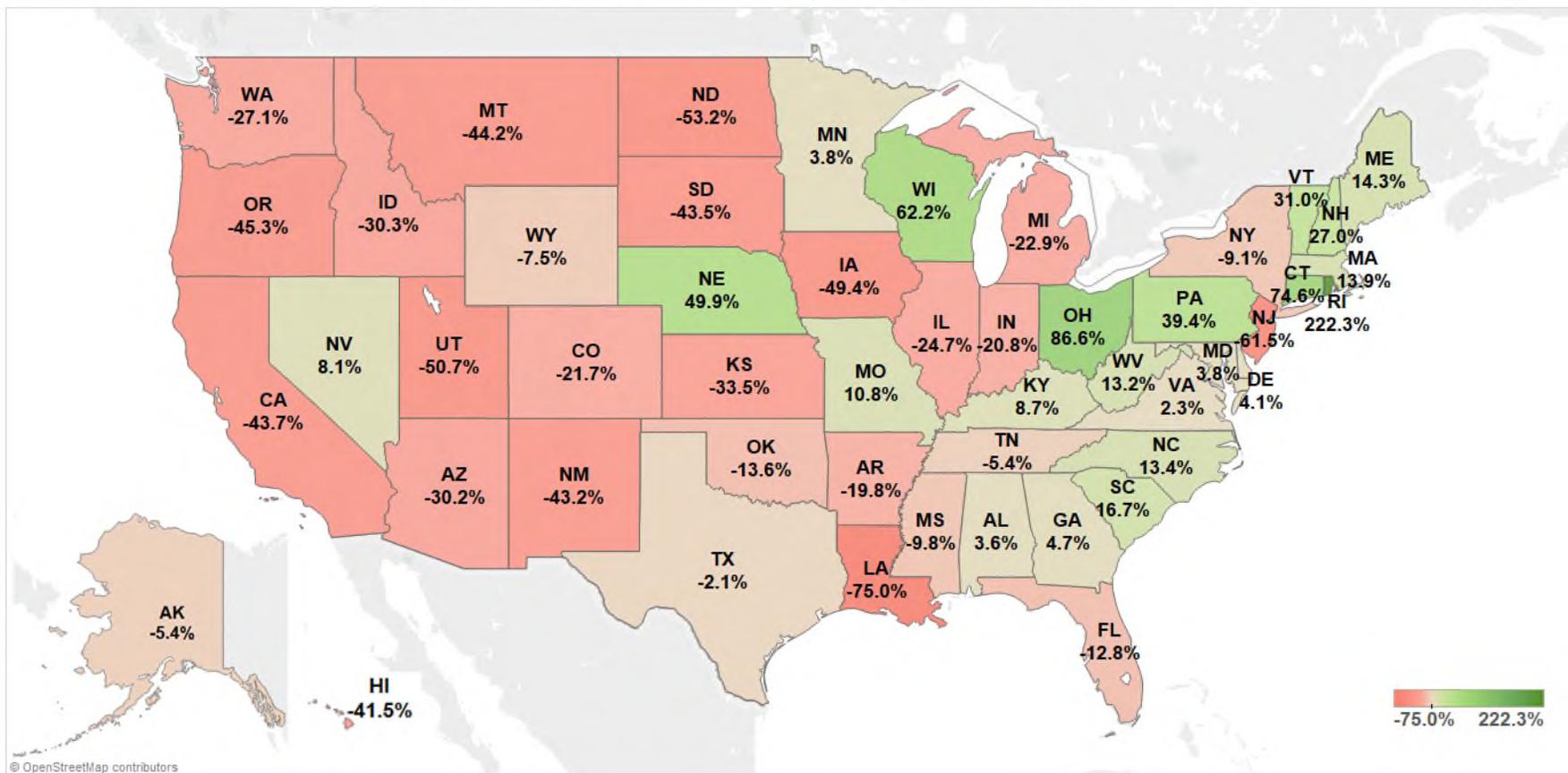


Figure 24, Change from 2004-2014 in Broiler Chicken AUs

There are almost 240,000 laying hen animal units in Iowa which is about 16% of the U.S. total. Other top states for layers include Ohio, Indiana, and Pennsylvania. The avian influenza outbreak of spring 2015 had a large impact on states heavy in egg production, particularly Iowa. It is not considered in this year's report, but it will impact next year's study.

Laying Hen AUs by State (2014)

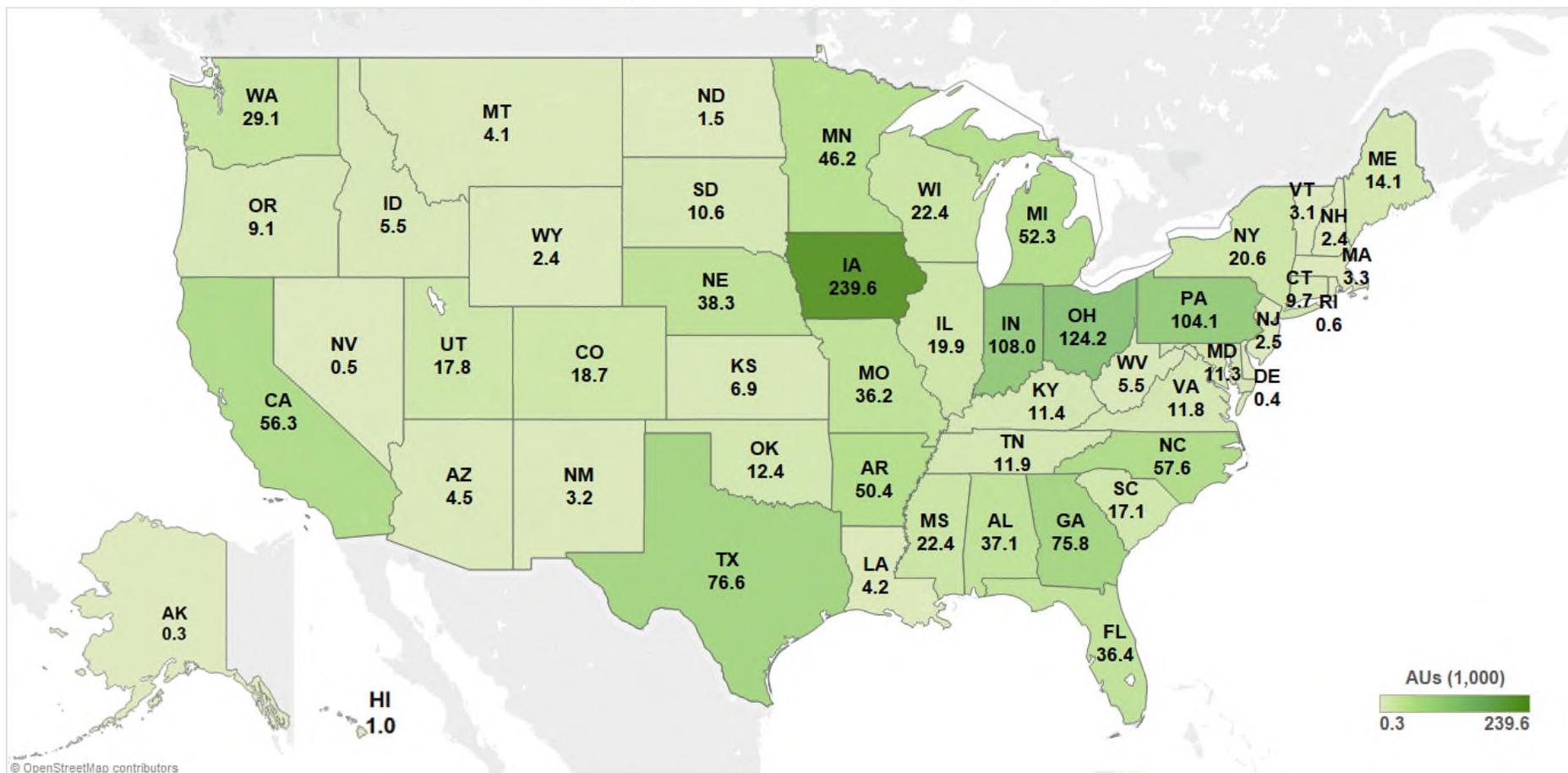


Figure 25, Laying Hen AUs by State (2014)

From 2004 to 2014, Iowa saw a 24.8% increase in layer animal units. States such as Arizona, Washington and Maine also saw large percentage increases, but in real terms those numbers are relatively small.

Change from 2004 to 2014 in Laying Hen AUs

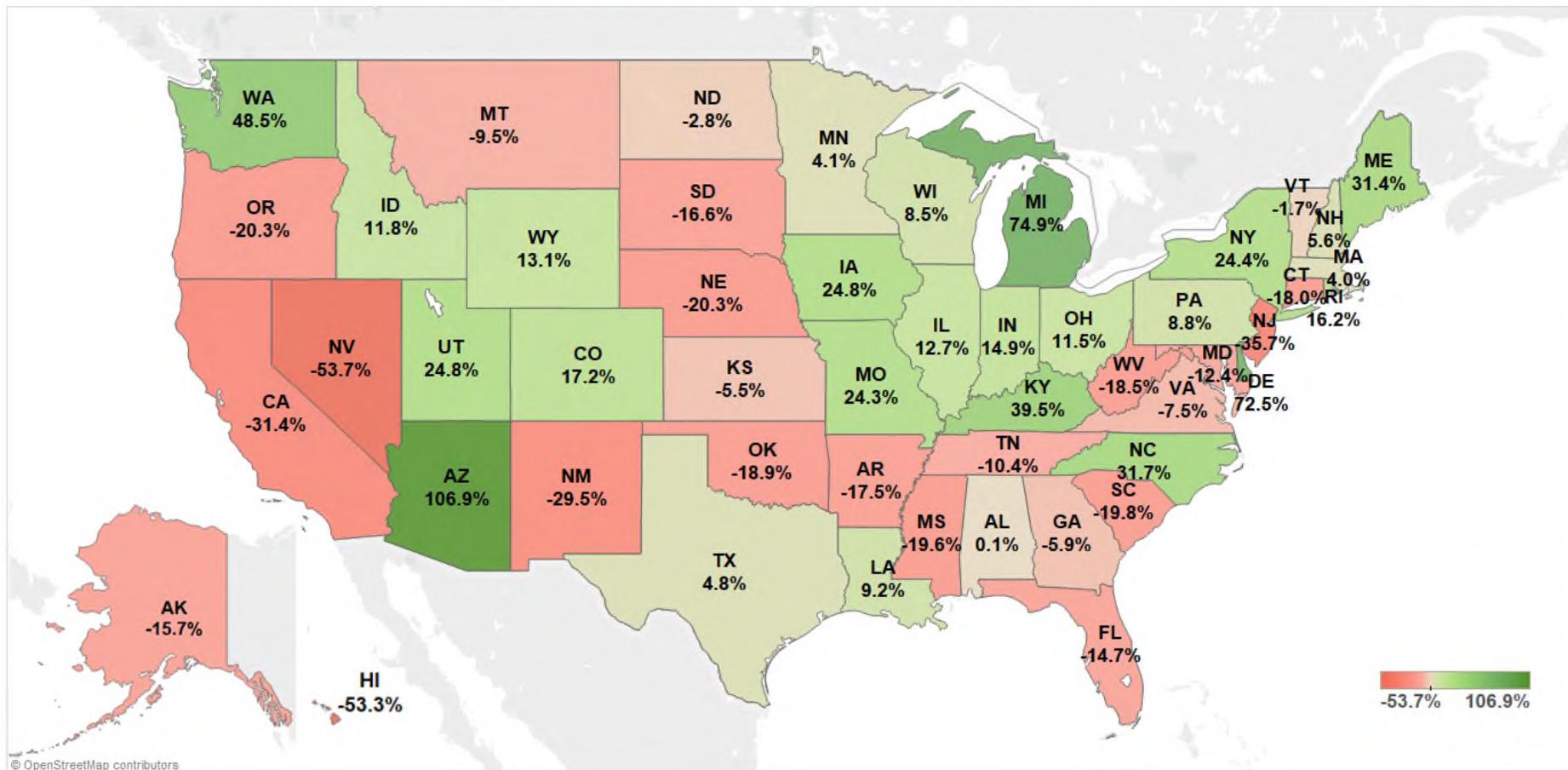


Figure 26, Change from 2004-2014 in Laying Hen AUs

Minnesota had the highest turkey animal units at 682,280, which was about 19% of the U.S. total turkey animal units. Other top states include Arkansas, North Carolina, Missouri and Virginia. The avian influenza outbreak of spring 2015 had a large impact on states heavy in turkey production, particularly Minnesota. It is not considered in this year’s report, but it will impact next year’s study.

Turkey AUs by State (2014)

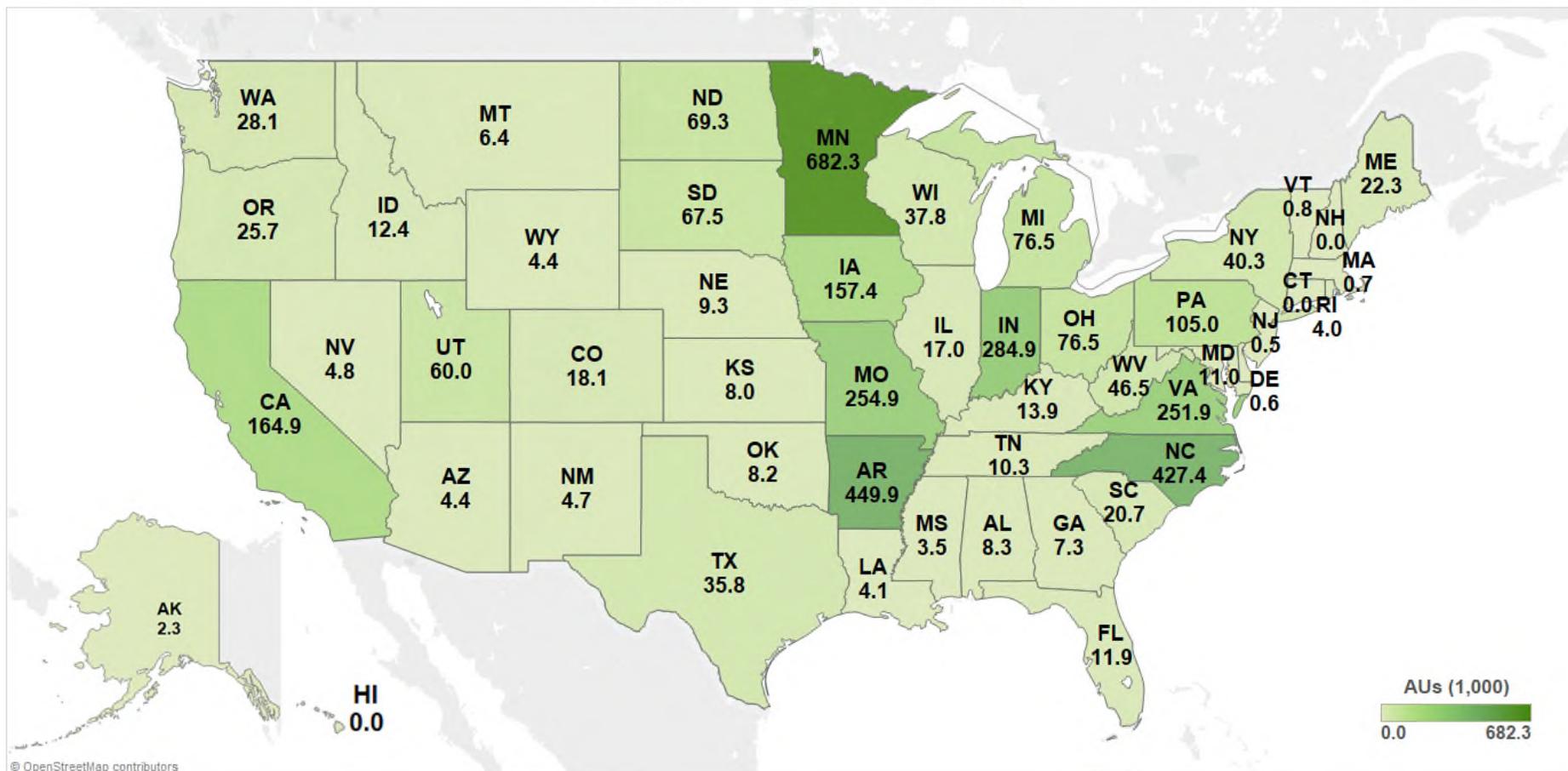


Figure 27, Turkey AUs by State (2014)

New York, North Dakota and Utah saw very large percentage increases in turkey animal units, but they only account for a small portion of the U.S. total. Indiana, which is the fourth highest in turkey animal units, saw a 42.8% increase from 2004 to 2014.

Change from 2004 to 2014 in Turkey AUs

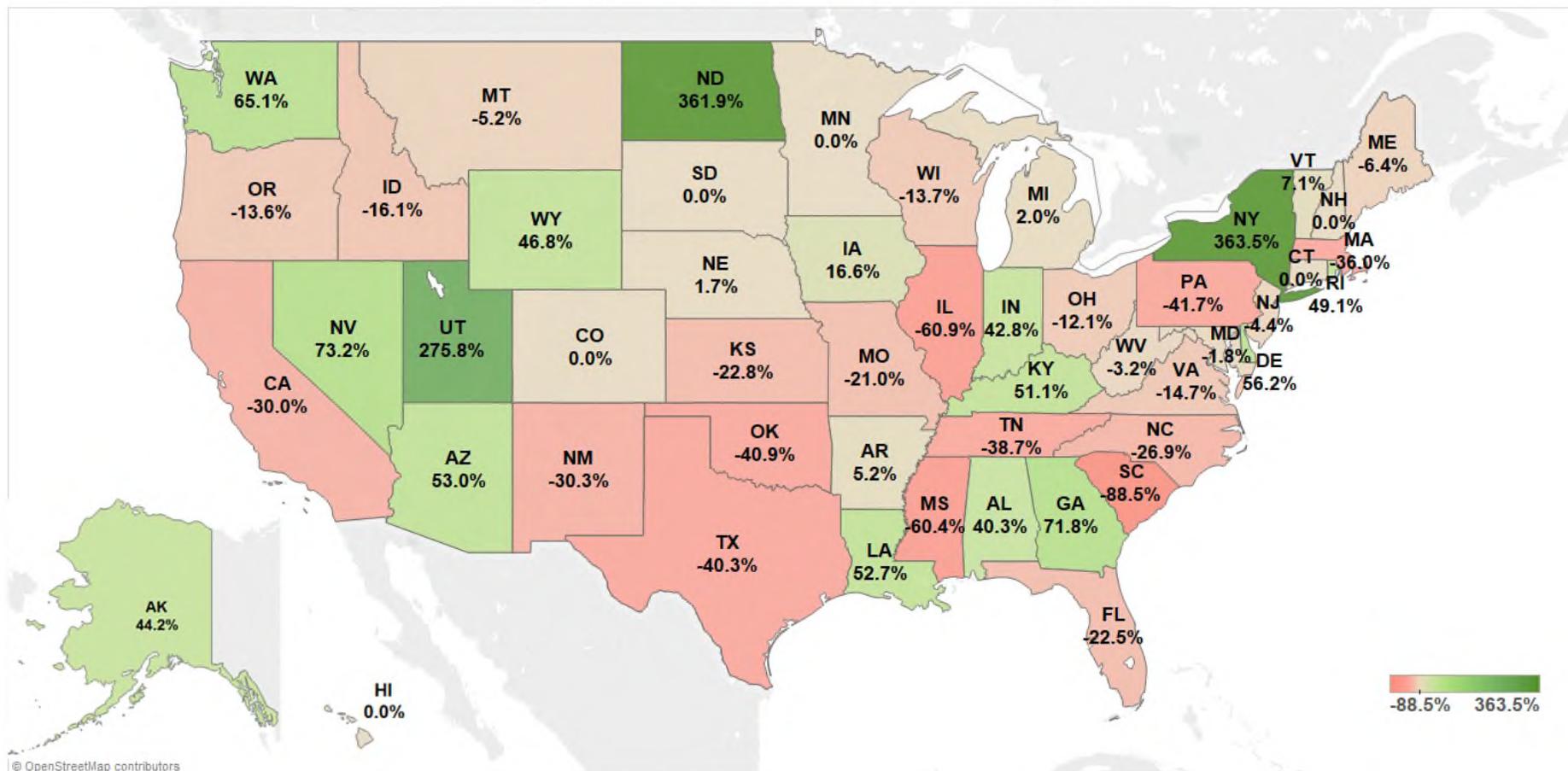


Figure 28, Change from 2004-2014 in Turkey AUs

Iowa, Minnesota and North Carolina were states that housed the most hog animal units with about 6.6, 2.6, and 2.3 million, respectively. Iowa accounts for nearly 30% of the nation’s hog animal units.

Hog AUs by State (2014)

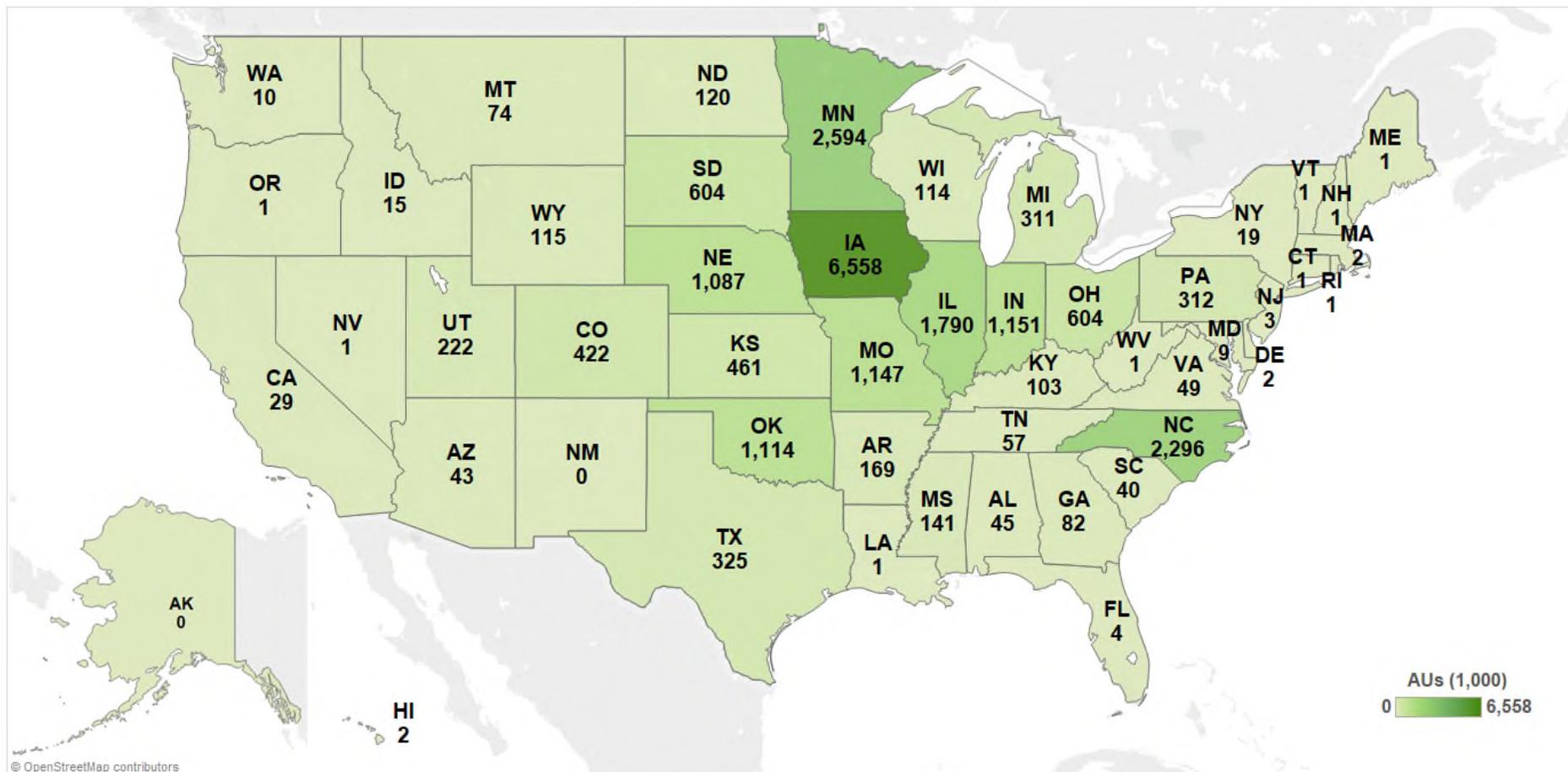


Figure 29, Hog AUs by State (2014)

Iowa, the leading state in hog production, saw a 47.9% increase from 2004 to 2014 in animal units. North Carolina, which has the second highest amount of hog animal units as of 2014 saw a 17.8% decrease from 2004 to 2014.

Change from 2004 to 2014 in Hog AUs

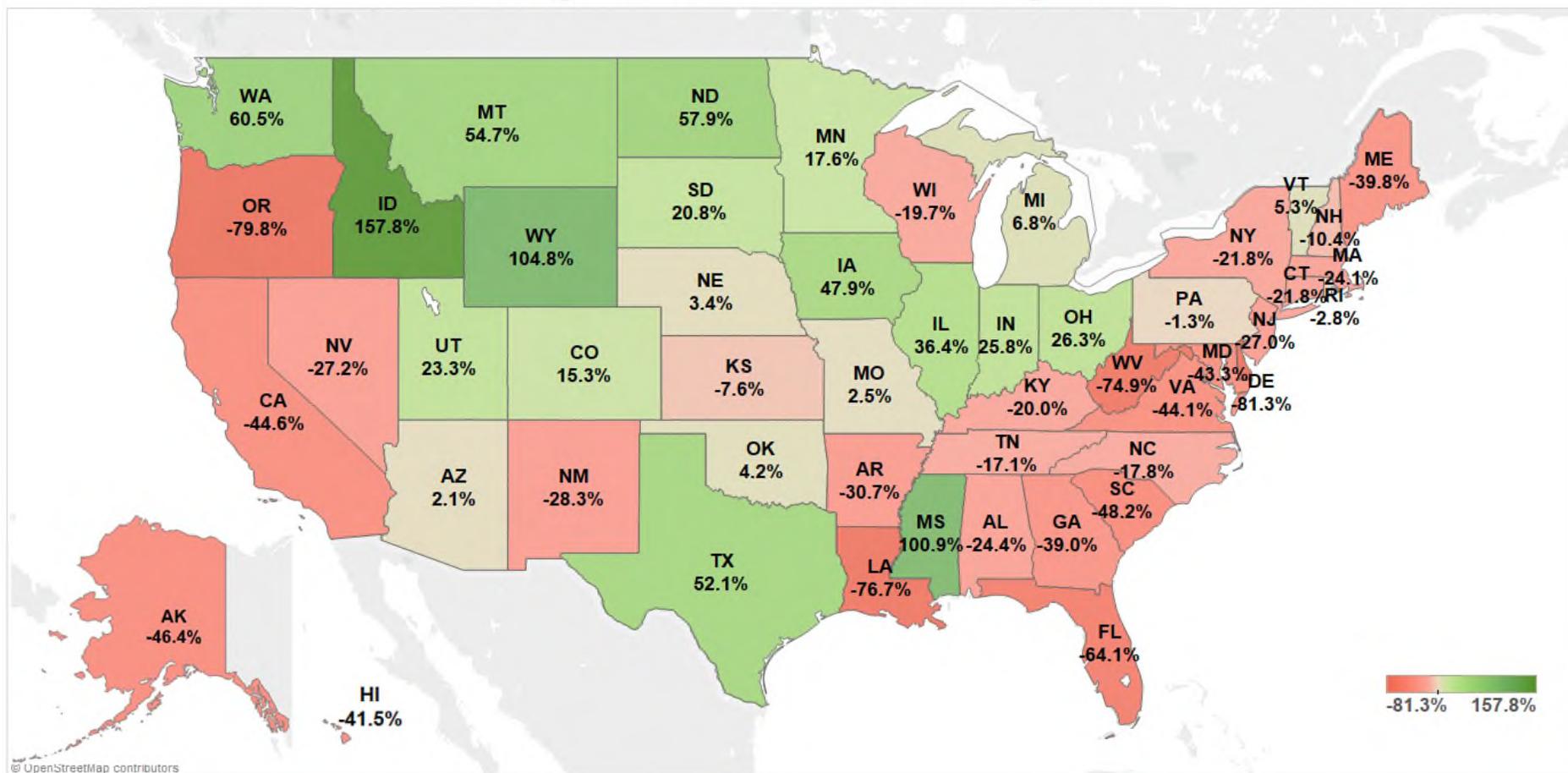


Figure 30, Change from 2004-2014 in Hog AUs

California and Wisconsin are clear leaders in dairy cows, with nearly 2.5 and 1.8 million animal units, respectively. The dairy industry continues to adapt as the demand for dairy products increase. Prolonged drought in California has caused dairy cows to move to other states such as Idaho, Wisconsin, and Michigan where forage supplies are more consistently available.

Dairy Cow AUs by State (2014)

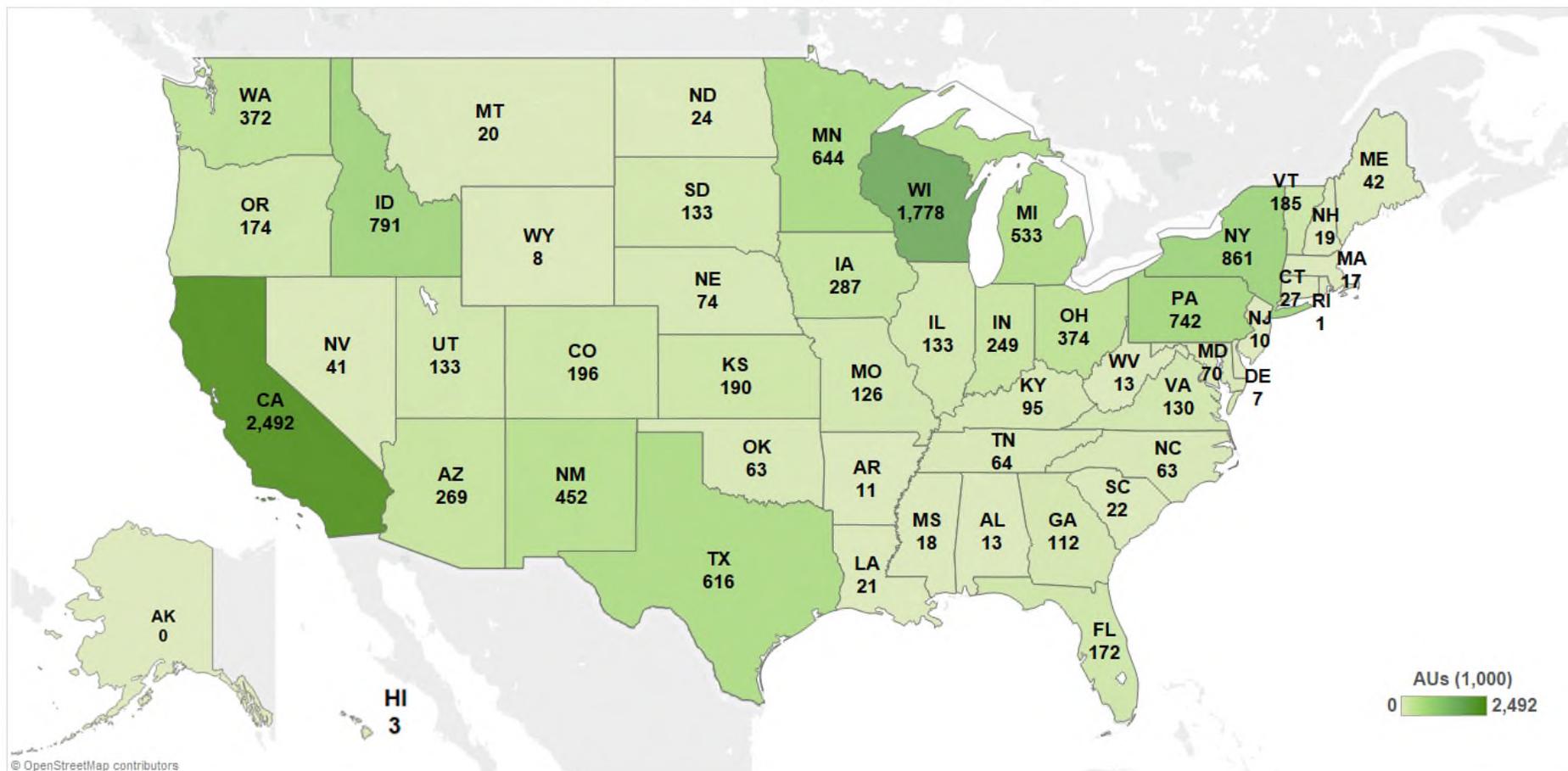


Figure 31, Dairy Cow AUs by State (2014)

California which had the highest amount of dairy cow animal units, saw a 4.7% increase from 2004 to 2014. Wisconsin, which is also known for their large dairy cow population only saw a 2.0% increase over that time frame. Idaho increased their dairy cow animal units by 37.1% from 2004 to 2014 to help it become one of the top states.

Change from 2004 to 2014 in Dairy Cow AUs

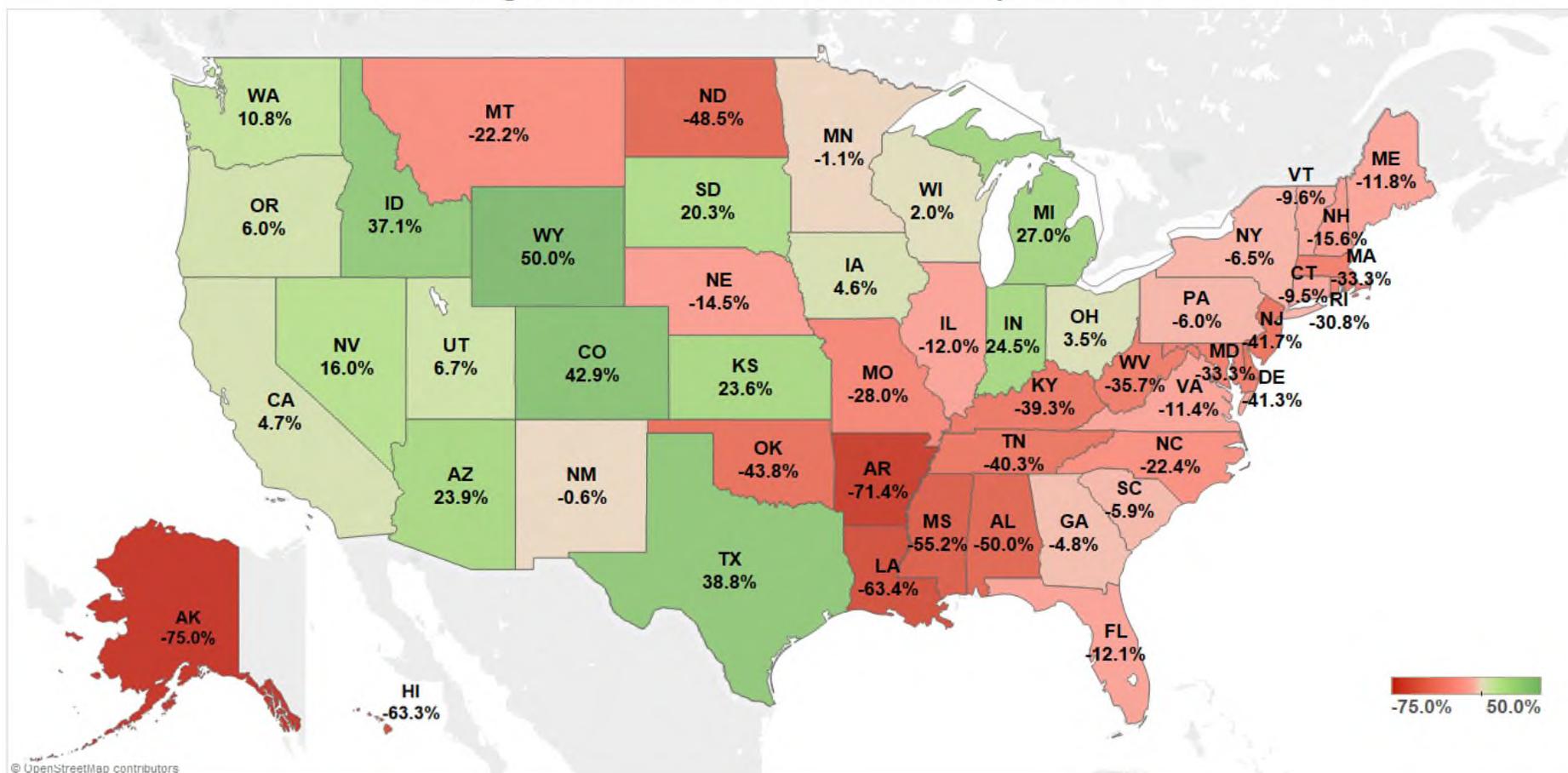


Figure 32, Change from 2004-2014 in Dairy Cow AUs

Nebraska, Texas, and Kansas are the states that lead the way in beef cow animal units, with 7.2, 6.6, and 5.3 million animal units, respectively. Iowa, Oklahoma, California and Colorado also exceed 2 million animal units of beef cows.

Beef Cow AUs by State (2014)

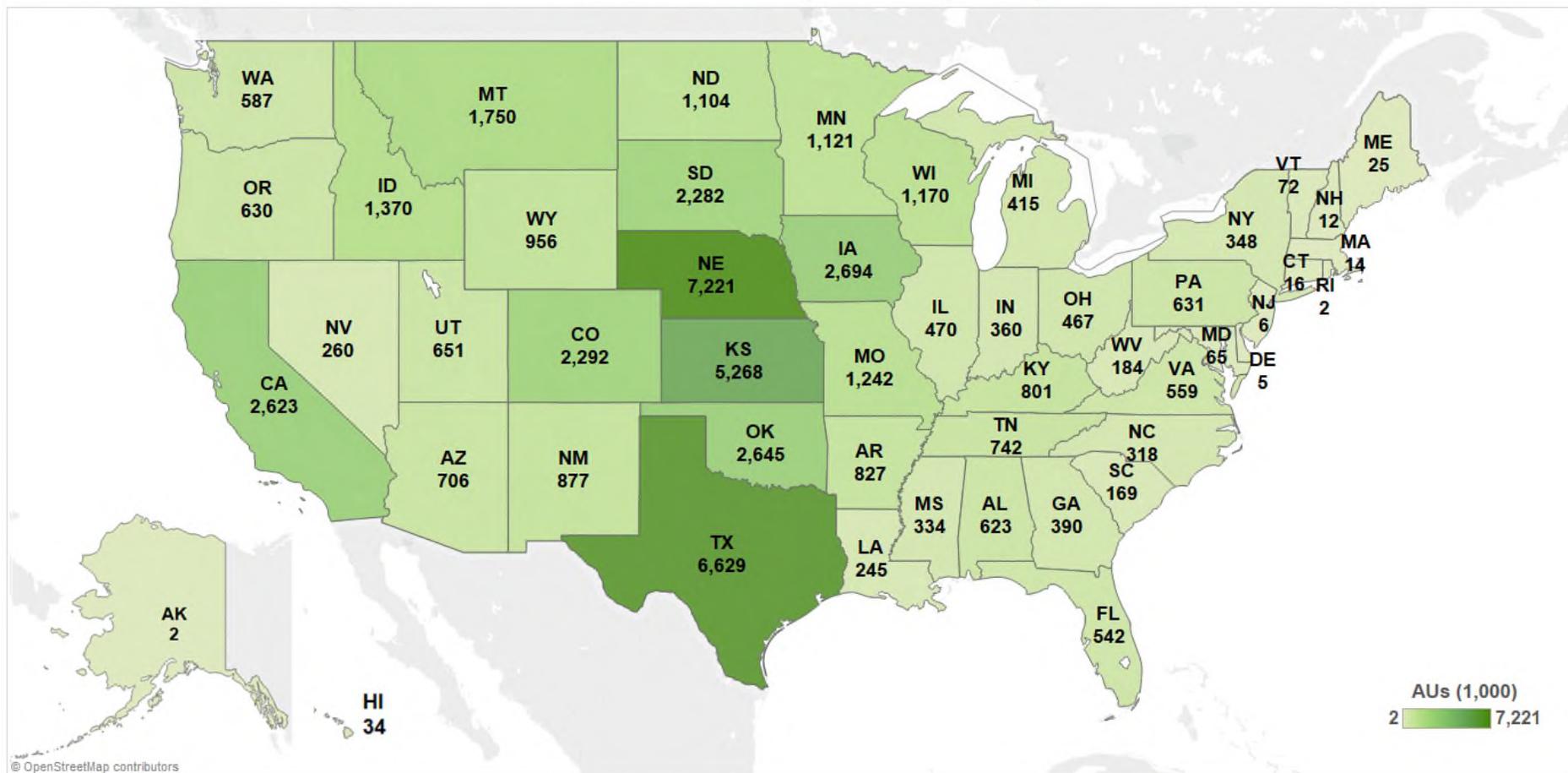


Figure 33, Beef Cow AUs by State (2014)

Nebraska saw a 9.7% increase in beef cow animal units from 2004 to 2014, while Texas saw a 28.7% decline. California, Iowa and South Dakota also steady increases over this time frame. Extremely dry periods during 2011-2013 had a significant impact on movement of cattle from states such as Texas and Kansas to Nebraska, South Dakota and Iowa.

Change from 2004 to 2014 in Beef Cow AUs

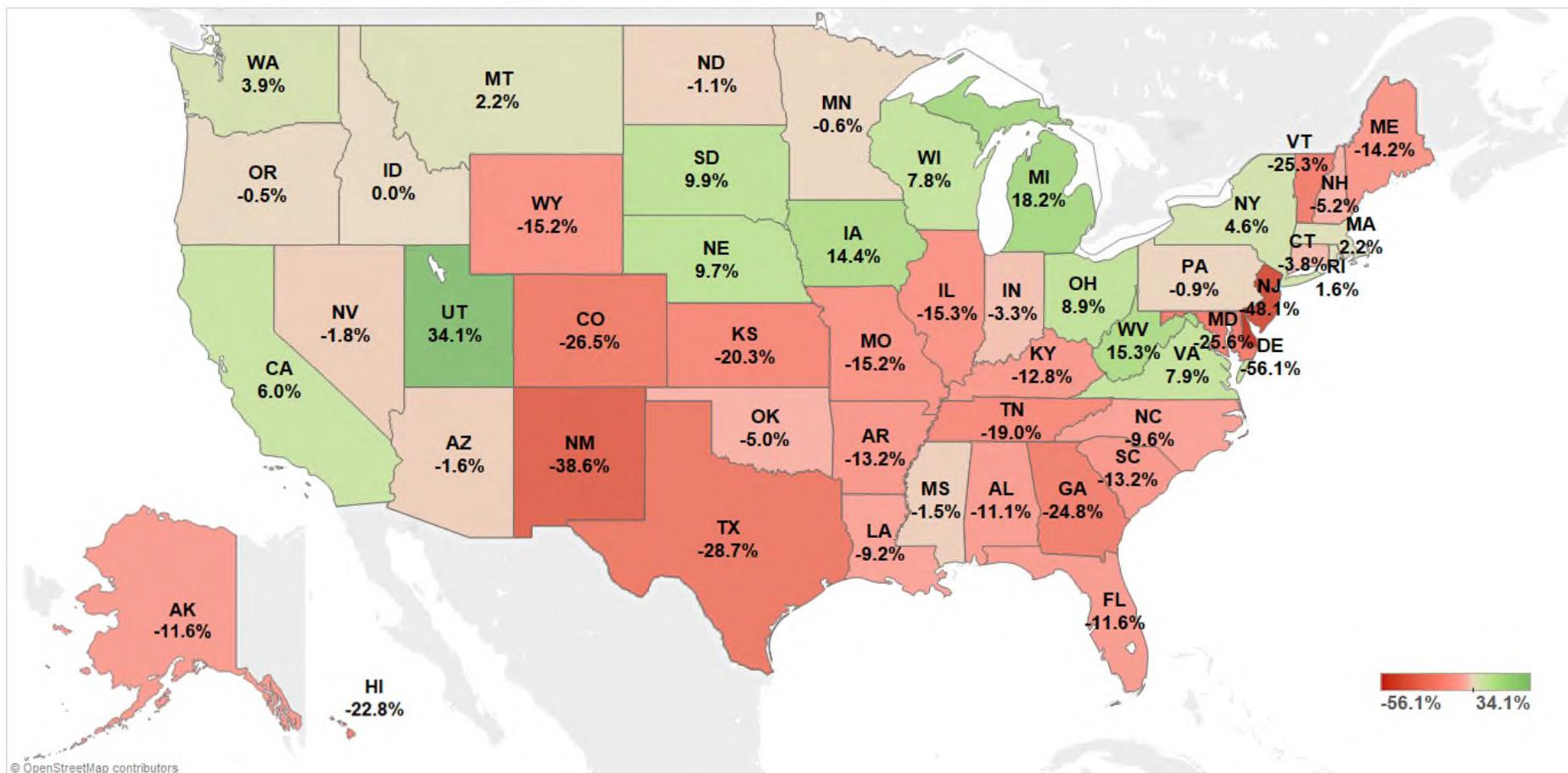
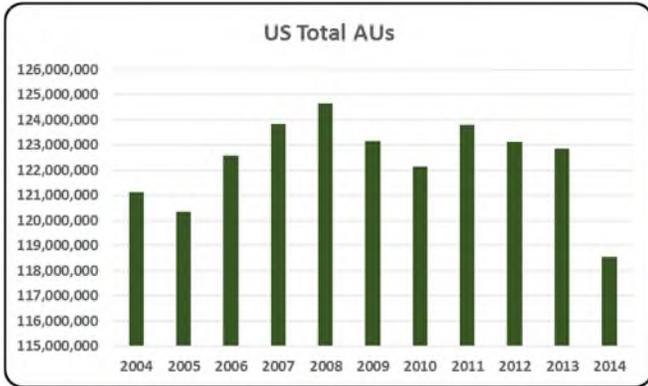
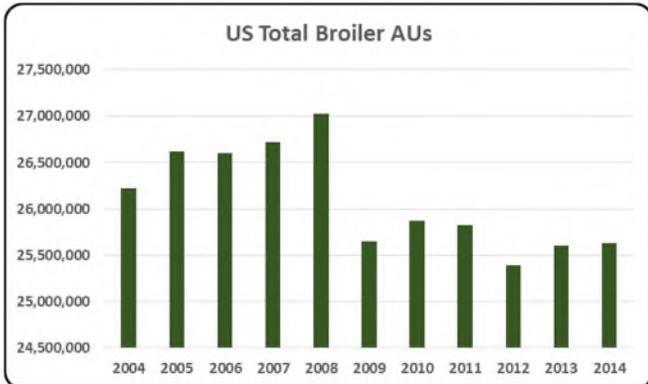


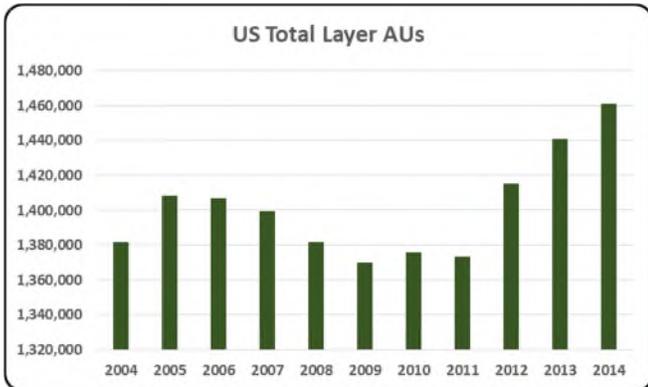
Figure 34, Change from 2004-2014 in Beef Cow AUs



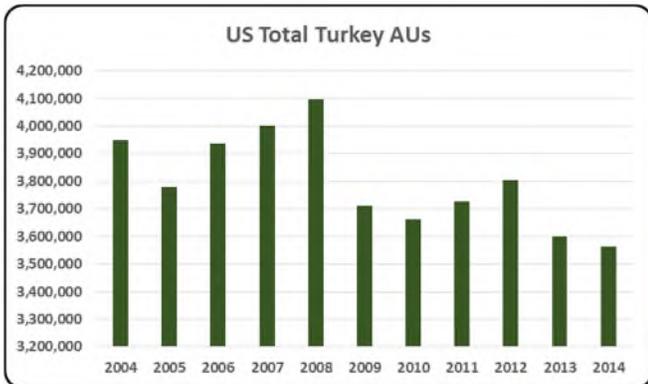
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



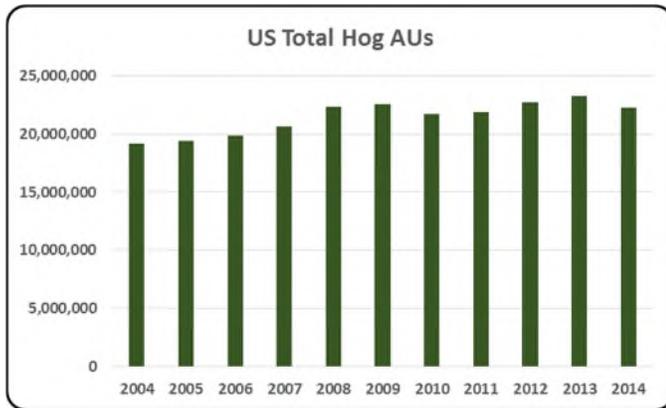
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



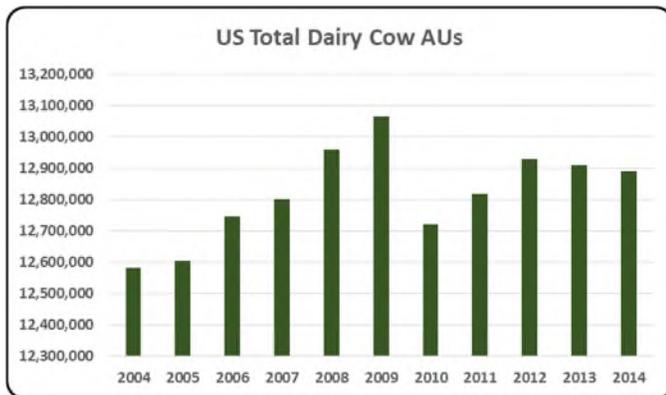
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



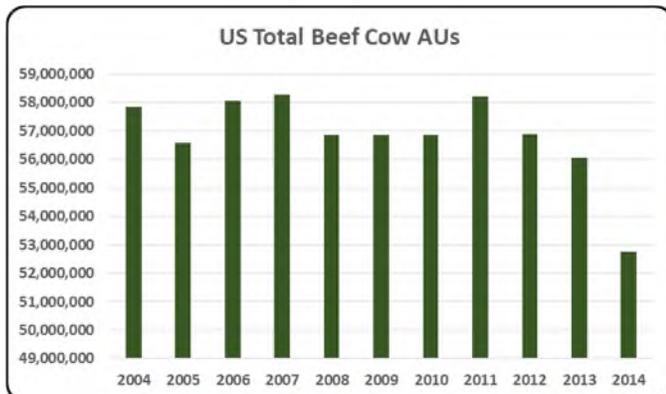
- From 2004 to 2014, the U.S. accounted for 50% of the world's turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.



- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.

State Level Results

2004-2014 Economic Analysis of Animal Agriculture: ALABAMA

Alabama Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Alabama's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture success in Alabama. The success of Alabama animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Alabama during 2014 animal agriculture contributed:

- \$12.7 billion in economic output
- 76,547 jobs
- \$2.2 billion in earnings
- \$557.5 million in income taxes paid at local, state, and federal levels
- \$47.6 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Alabama has increased economic output by over \$2.3 billion, boosted household earnings by \$406.9 million, contributed 13,774 additional jobs and paid \$103.1 million in additional tax revenues.

Alabama's animal agriculture consumed about 1.6 million tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (1.5 million tons)
- Aquaculture (40.5 thousand tons)
- Egg-Laying Hens (23.3 thousand tons)

This report examines animal agriculture in Alabama over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Alabama, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Alabama and beyond.

Alabama Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Alabama's economy. In 2014, Alabama's animal agriculture contributed the following to the economy:

- About \$12.7 billion in economic output
- \$2.2 billion in household earnings
- 76,547 jobs
- \$557.5 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Alabama's animal agriculture has:

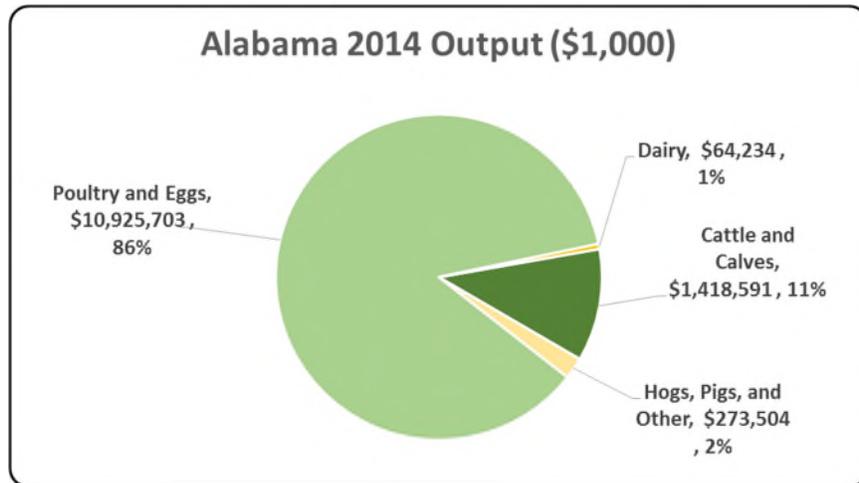
- Increased economic output by \$2.3 billion
- Boosted household earnings by \$406.9 million
- Added 13,774 jobs
- Paid an additional \$103.1 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 12,682,033 | \$ 2,347,869 | 22.72% |
| Earnings (\$1,000) | \$ 2,201,044 | \$ 406,856 | 22.68% |
| Employment (Jobs) | 76,547 | 13,774 | 21.94% |
| Income Taxes Paid (\$1,000) | \$ 557,524 | \$ 103,057 | 22.68% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 47,636 | | |

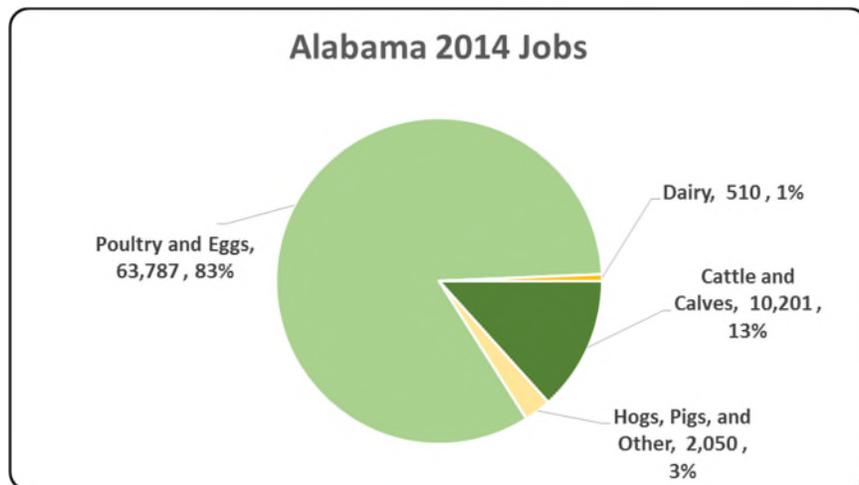
Alabama Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Alabama economy. Animal agriculture’s impact on Alabama total economic output is about \$12.7 billion.



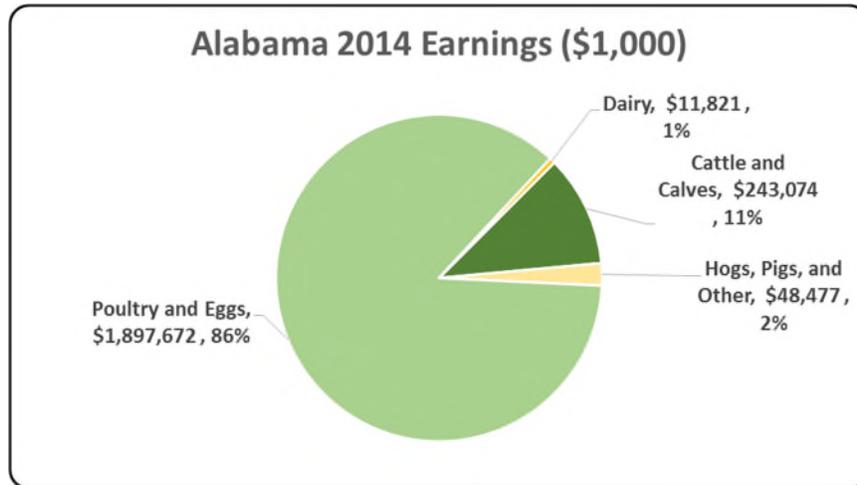
Alabama Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Alabama in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Alabama total jobs, contributing 76,547 jobs within and outside of animal agriculture.



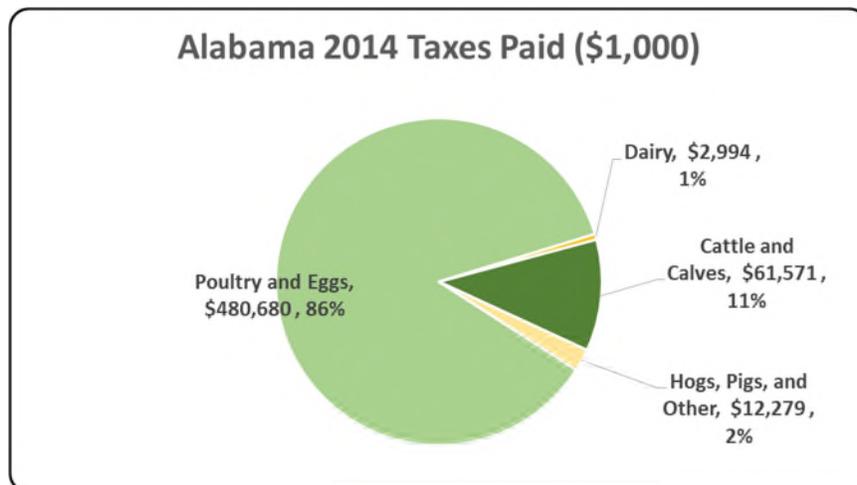
Alabama Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Alabama economy in terms of earnings. Alabama’s animal agriculture contributed about \$2.2 billion to household earnings in 2014.



Alabama Taxes Paid by Animal Agriculture

Alabama’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$557.5 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$47.6 million in property taxes paid by all of Alabama agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



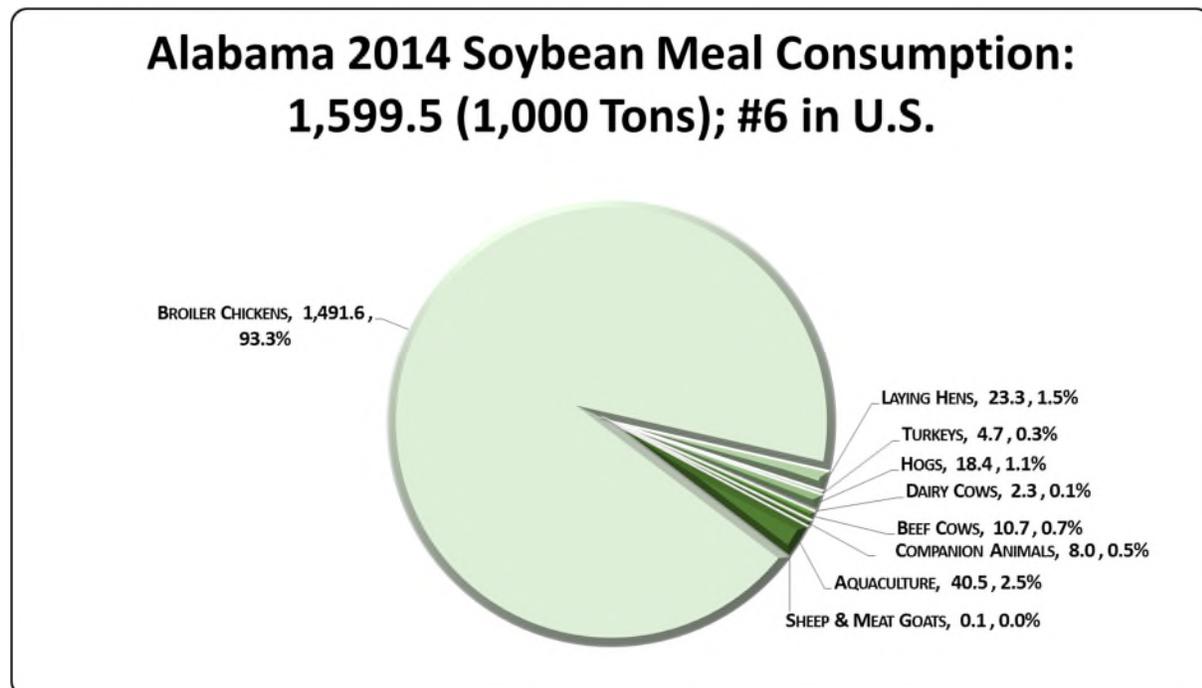
Alabama Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Alabama's animal agriculture consumed almost 1.6 million tons of soybean meal in 2014, placing the state as #6 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (1.5 million tons)
- Aquaculture (40.5 thousand tons)
- Egg-Laying Hens (23.3 thousand tons)

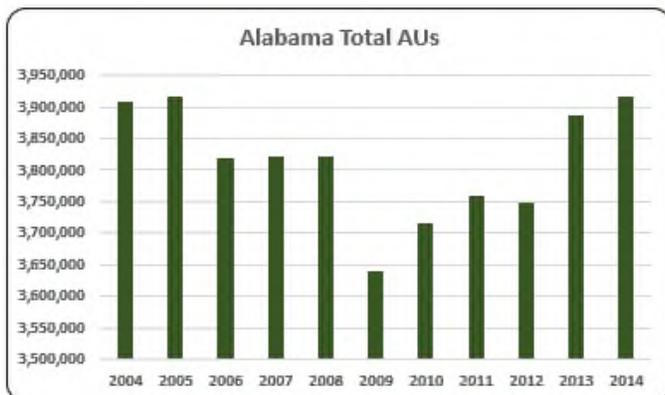
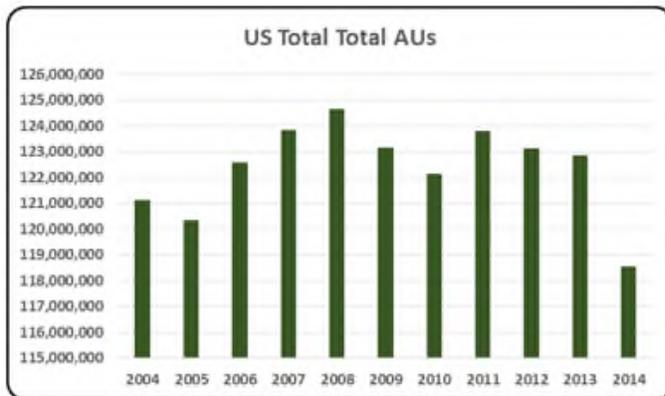


Alabama Animal Unit (AU) Trends

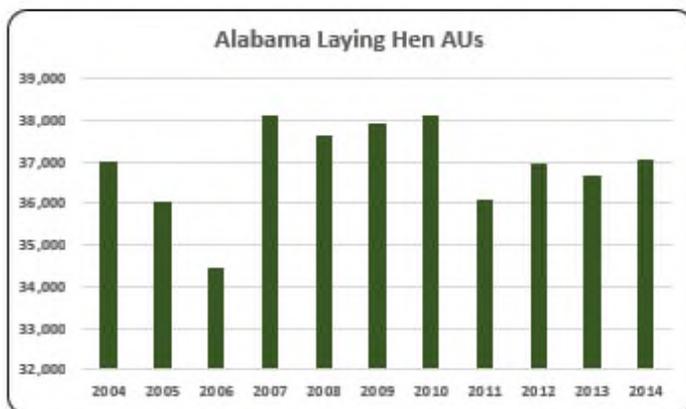
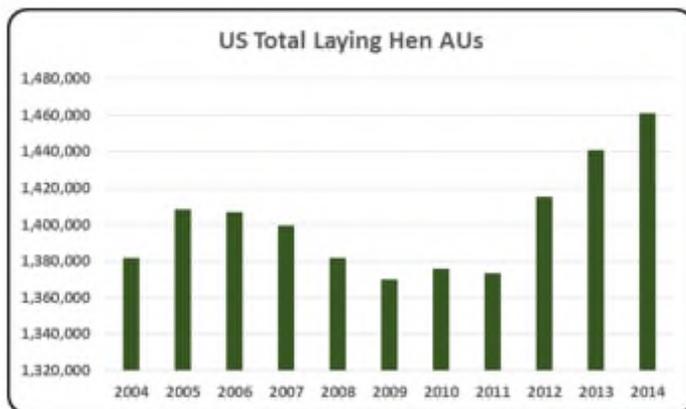
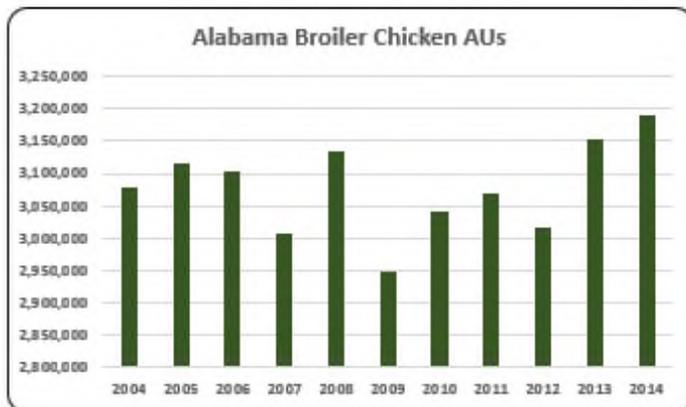
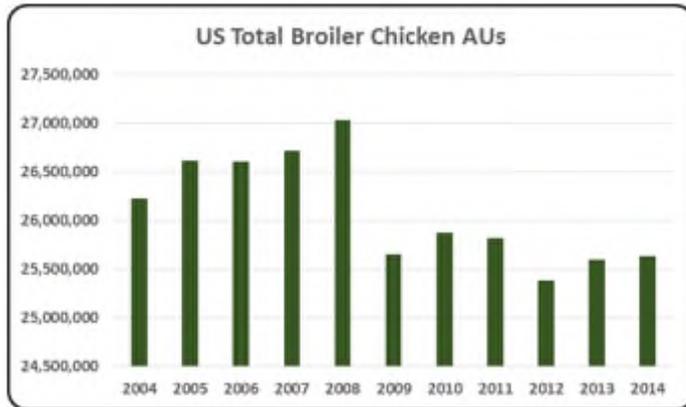
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Alabama. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Alabama and to give perspective on Alabama’s contribution to the nation’s animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

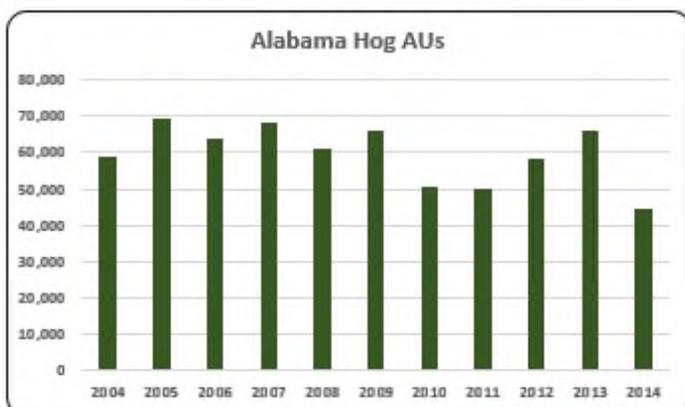
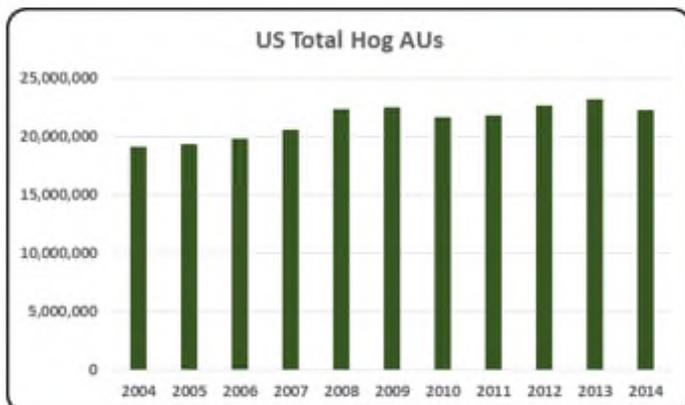
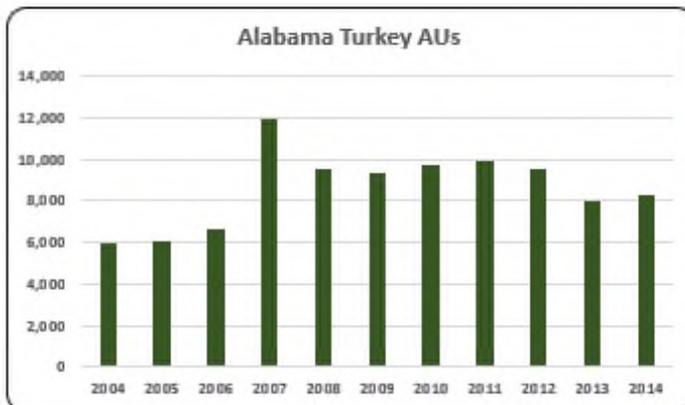
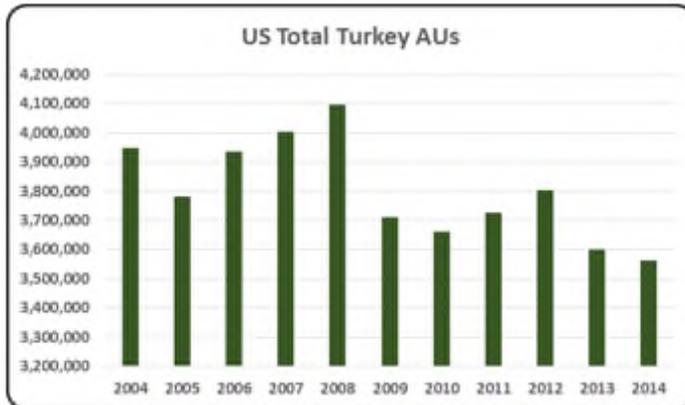
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Alabama, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (3,190.4 thousand AUs), Beef Cows (622.8 thousand AUs), and Hogs (44.7 thousand AUs). Total animal units in Alabama during 2014 were 3,915.9 thousand AUs.



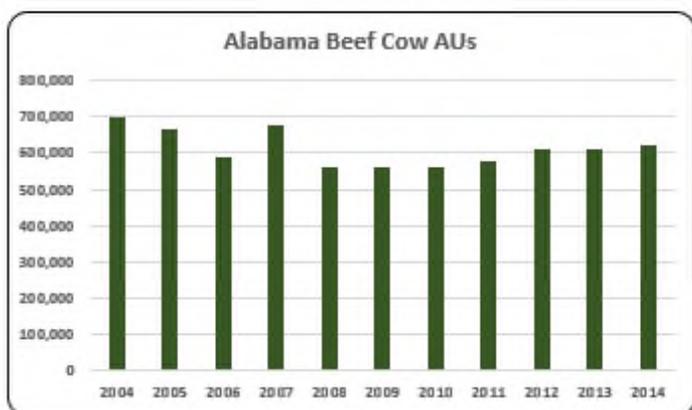
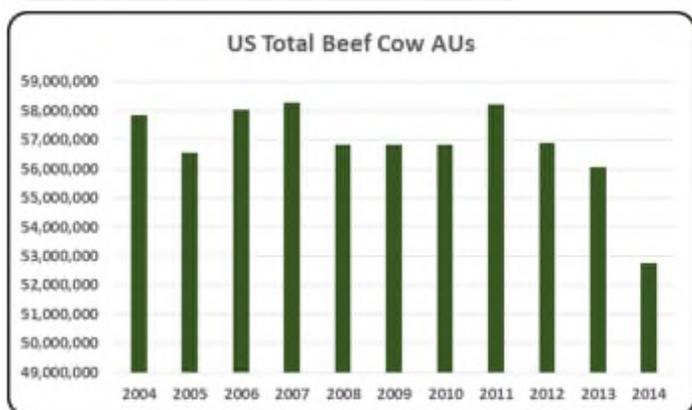
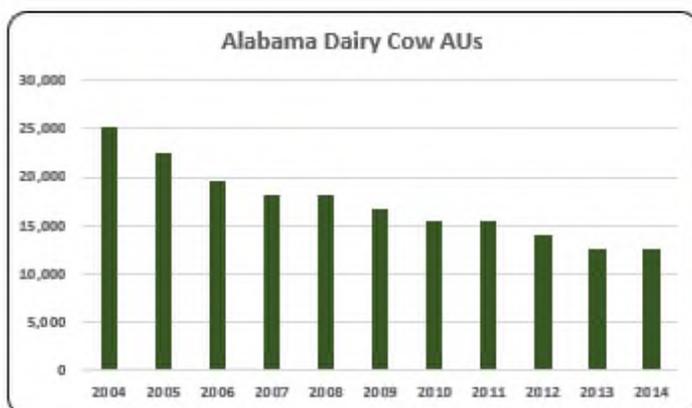
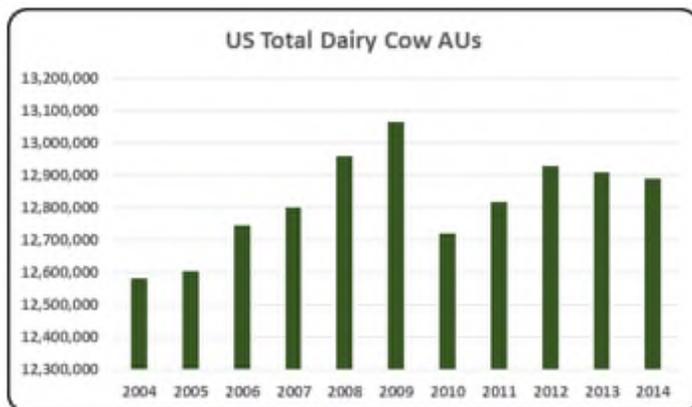
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- On average there were 3.8 million total AUs in the state of Alabama from 2004 to 2014.



- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- As a large broiler producer in the country, 81% of the 2014 total AUs (3.2 million) in Alabama were broilers. The average broiler AUs during last decade was 3.1 million and in 2014 the number increased 1.2% to a record high of 3.2 million relative to the previous year.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- 37,074 layer AUs were present in 2014 and on average from 2004 to 2014, the number of layer AUs was 36,916.



- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production in Alabama is the smallest of all animal production in the state with an average number of turkey AUs of 8,614 during the last decade, and only 0.21% of the all 2014 AUs in the State.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- In 2014, there were 44,700 hog AUs in Alabama. This number decreased 32.6% from the hog AUs during the previous year (66,300 AUs).



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.
- There were 12,600 dairy cow AUs in 2014 in the state of Alabama and there were on average 17,309 dairy cow AUs from 2004 to 2014.
- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.
- After broilers, beef cow production is the second largest animal production in Alabama. The average number of beef cows was 612,777 from 2004 to 2014. The number of beef cow AUs increased 2.1% to 622,800 in 2014 compared to the previous year.

Alabama Additional Information and Methodology

Animal agriculture is an important part of Alabama's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Alabama, of interest is the degree to which the industry impacts the Alabama economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Alabama animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Alabama's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Alabama which have occurred. As shown in this state report, Alabama has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Alabama. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Alabama Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Alabama’s economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of “per million dollars” of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Alabama, \$1.856 to \$2.559 million in total economic activity, \$0.329 to \$0.444 in household wages and 14 to 17 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.3029 | \$ 0.3946 | 16.6 |
| | Hogs, Pigs, and Other | \$ 1.8562 | \$ 0.3290 | 13.9 |
| | Poultry and Eggs | \$ 2.5586 | \$ 0.4444 | 14.9 |
| | Dairy | \$ 2.1198 | \$ 0.3901 | 16.8 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 700,950 | 667,650 | 590,850 | 676,200 | 559,650 | 559,650 | 559,650 | 579,600 | 613,425 | 610,125 | 622,800 |
| | Hog and Pig AUs | 59,100 | 69,150 | 64,050 | 68,400 | 61,350 | 66,150 | 50,850 | 50,100 | 58,200 | 66,300 | 44,700 |
| | Broiler AUs | 3,079,891 | 3,115,335 | 3,103,038 | 3,007,824 | 3,134,057 | 2,949,178 | 3,041,097 | 3,067,922 | 3,016,608 | 3,151,723 | 3,190,374 |
| | Turkey AUs | 5,924 | 6,076 | 6,602 | 11,907 | 9,517 | 9,322 | 9,710 | 9,884 | 9,539 | 7,957 | 8,311 |
| | Egg Layer AUs | 37,020 | 36,052 | 34,460 | 38,108 | 37,628 | 37,900 | 38,096 | 36,092 | 36,957 | 36,684 | 37,074 |
| | Dairy AUs | 25,200 | 22,400 | 19,600 | 18,200 | 18,200 | 16,800 | 15,400 | 15,400 | 14,000 | 12,600 | 12,600 |
| | Total Animal Units | 3,908,085 | 3,916,663 | 3,818,600 | 3,820,639 | 3,820,402 | 3,639,000 | 3,714,804 | 3,758,997 | 3,748,729 | 3,885,389 | 3,915,858 |
| | | | | | | | | | | | | |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 440,044 | \$ 430,244 | \$ 397,232 | \$ 364,990 | \$ 334,034 | \$ 309,827 | \$ 408,234 | \$ 401,395 | \$ 498,843 | \$ 466,929 | \$ 616,002 |
| | Hogs and Pigs (\$1,000) | \$ 22,346 | \$ 37,239 | \$ 30,982 | \$ 34,326 | \$ 28,414 | \$ 42,186 | \$ 37,691 | \$ 35,652 | \$ 33,361 | \$ 41,233 | \$ 35,079 |
| | Broilers (\$1,000) | \$ 2,406,976 | \$ 2,409,591 | \$ 2,047,824 | \$ 2,418,707 | \$ 2,689,160 | \$ 2,519,304 | \$ 2,789,334 | \$ 2,671,518 | \$ 2,810,100 | \$ 3,564,425 | \$ 3,854,232 |
| | Turkeys (\$1,000) | \$ 5,497 | \$ 5,829 | \$ 6,889 | \$ 13,731 | \$ 12,854 | \$ 8,621 | \$ 11,549 | \$ 12,953 | \$ 13,835 | \$ 9,111 | \$ 15,254 |
| | Eggs (\$1,000) | \$ 287,956 | \$ 281,595 | \$ 295,990 | \$ 313,003 | \$ 298,550 | \$ 286,893 | \$ 291,344 | \$ 322,651 | \$ 352,021 | \$ 388,780 | \$ 400,702 |
| | Milk (\$1,000) | \$ 43,855 | \$ 37,856 | \$ 31,262 | \$ 42,158 | \$ 39,928 | \$ 25,584 | \$ 30,420 | \$ 33,748 | \$ 28,080 | \$ 27,729 | \$ 30,302 |
| | Other | \$ 101,744 | \$ 102,796 | \$ 103,848 | \$ 104,901 | \$ 105,953 | \$ 107,006 | \$ 108,058 | \$ 109,110 | \$ 110,163 | \$ 111,215 | \$ 112,267 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 101,744 | \$ 102,796 | \$ 103,848 | \$ 104,901 | \$ 105,953 | \$ 107,006 | \$ 108,058 | \$ 109,110 | \$ 110,163 | \$ 111,215 | \$ 112,267 |
| | Total (\$1,000) | \$ 3,308,417 | \$ 3,305,150 | \$ 2,914,027 | \$ 3,291,816 | \$ 3,508,894 | \$ 3,299,420 | \$ 3,676,630 | \$ 3,587,028 | \$ 3,846,402 | \$ 4,609,422 | \$ 5,063,838 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 23,233 | 22,684 | 20,314 | 17,698 | |
| | Cattle feedlots (112112) | 566 | 161 | 16 | - | |
| | Dairy cattle and milk production (11212) | 196 | 215 | 116 | 87 | |
| | Hog and pig farming (1122) | 413 | 220 | 287 | 177 | |
| | Poultry and egg production (1123) | 3,233 | 3,450 | 3,818 | 3,815 | |
| | Sheep and goat farming (1124) | 343 | 697 | 1,626 | 1,904 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,449 | 4,667 | 6,219 | 4,313 | |
| Value of Sales (\$1,000) | Cattle and Calves | 292,784 | 348,253 | 408,276 | 429,349 | |
| | Hogs and Pigs | 34,480 | 39,441 | 54,618 | 33,424 | |
| | Poultry and Eggs | 2,093,768 | 2,137,299 | 3,113,194 | 3,624,852 | |
| | Milk and Other Dairy Products | 52,573 | 46,129 | 38,270 | 28,113 | |
| | Aquaculture | 59,694 | 80,976 | 99,504 | 117,920 | |
| | Other (calculated) | 9,145 | 22,583 | 24,701 | 9,142 | |
| | Total | 2,542,444 | 2,674,681 | 3,738,563 | 4,242,800 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 13,213 | 13,420 | 11,619 | 11,777 | |
| | | \$1,000 | 341,450 | 505,196 | 701,381 | 751,245 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 7,124 | 5,994 | 6,793 | |
| | | \$1,000 | <i>n/a</i> | 17,300 | 56,499 | 81,263 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 7,830 | 7,022 | 6,491 | |
| | | \$1,000 | <i>n/a</i> | 487,896 | 644,882 | 669,983 |
| Feed purchased | (Farms) | 26,309 | 32,201 | 30,051 | 29,985 | |
| | \$1,000 | 1,140,545 | 927,774 | 1,611,020 | 2,195,586 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|----------------------|---------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,418,591 | \$ 243,074 | 10,201 | \$ 61,571 |
| | Hogs, Pigs, and Other | \$ 273,504 | \$ 48,477 | 2,050 | \$ 12,279 |
| | Poultry and Eggs | \$ 10,925,703 | \$ 1,897,672 | 63,787 | \$ 480,680 |
| | Dairy | \$ 64,234 | \$ 11,821 | 510 | \$ 2,994 |
| | Total | \$ 12,682,033 | \$ 2,201,044 | 76,547 | \$ 557,524 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 148,592 | \$ 25,461 | 1,068 | \$ 6,449 |
| | Hogs, Pigs, and Other | \$ (15,160) | \$ (2,687) | (114) | \$ (681) |
| | Poultry and Eggs | \$ 2,266,708 | \$ 393,702 | 13,234 | \$ 99,725 |
| | Dairy | \$ (52,271) | \$ (9,619) | (415) | \$ (2,437) |
| | Total | \$ 2,347,869 | \$ 406,856 | 13,774 | \$ 103,057 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.3029 | \$ 0.3946 | 16.6 | |
| | Hogs, Pigs, and Other | \$ 1.8562 | \$ 0.3290 | 13.9 | |
| | Poultry and Eggs | \$ 2.5586 | \$ 0.4444 | 14.9 | |
| | Dairy | \$ 2.1198 | \$ 0.3901 | 16.8 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 5.0% |
| | Total | | | | 25.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: ALASKA

Alaska Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Alaska's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor of animal agriculture's success in Alaska. In the state of Alaska during 2014 animal agriculture contributed:

- \$21.8 million in economic output
- 90 jobs
- \$3.1 million in earnings
- \$0.6 million in income taxes paid at local, state, and federal levels
- \$1.3 million in the form of property taxes

Alaska's animal agriculture consumed about 2,300 tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Turkeys (1,300 tons)
- Companion Animals (600 tons)
- Egg-Laying Hens (200 tons)

This report examines animal agriculture in Alaska over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Alaska, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of Alaska.

Alaska Economic Impact of Animal Agriculture

Animal agriculture is a small part of Alaska's economy. In 2014, Alaska's animal agriculture contributed the following to the economy:

- About \$21.8 million in economic output
- \$3.1 million in household earnings
- 90 jobs
- \$0.6 million in income taxes

During the last decade contractions in Alaska's animal agriculture has:

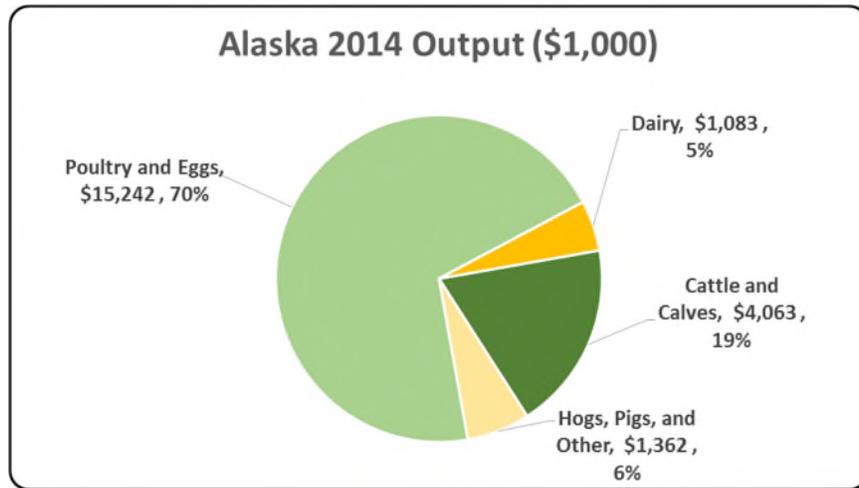
- Decreased economic output by \$1.0 million
- Reduced household earnings by \$200,000
- Shrunk by 10 jobs
- Paid \$39,000 less in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|-----------|------------------|--------------------|
| Output (\$1,000) | \$ 21,750 | \$ (1,039) | -4.56% |
| Earnings (\$1,000) | \$ 3,133 | \$ (194) | -5.83% |
| Employment (Jobs) | 90 | (10) | -10.28% |
| Income Taxes Paid (\$1,000) | \$ 637 | \$ (39) | -5.83% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 1,345 | | |

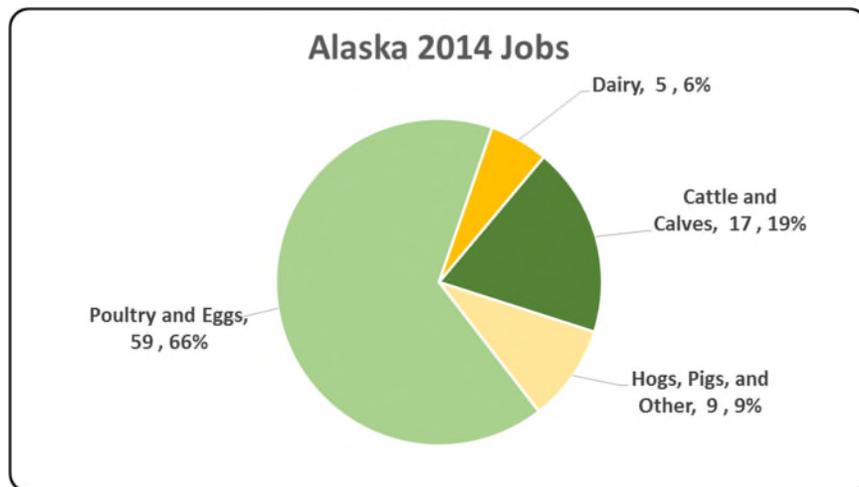
Alaska Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Alaska economy. Animal agriculture’s impact on Alaska total economic output is about \$21.8 million.



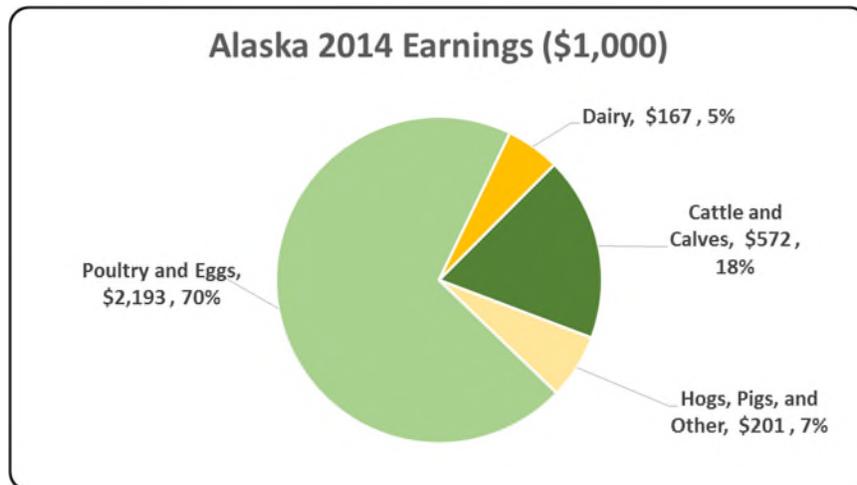
Alaska Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Alaska in terms of animal agriculture jobs. As shown, animal agriculture contributes about 90 jobs within and outside of animal agriculture.



Alaska Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Alaska economy in terms of earnings. Alaska’s animal agriculture contributed about \$3.1 million to household earnings in 2014.



Alaska Taxes Paid by Animal Agriculture

Alaska’s animal agriculture is not a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$600,000 in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$1.3 million in property taxes paid by all of Alaska agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



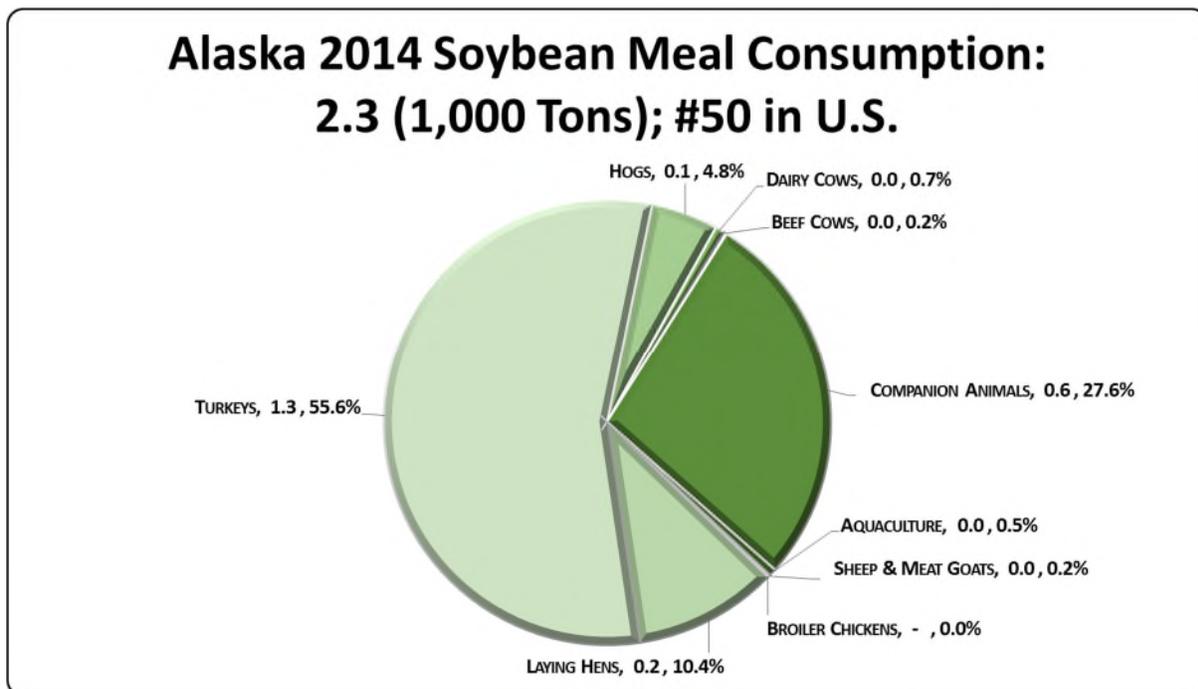
Alaska Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Alaska’s animal agriculture consumed almost 2,300 tons of soybean meal in 2014, placing the state as #50 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Turkeys (1,300 tons)
- Companion Animals (600 tons)
- Egg-Laying Hens (200 tons)

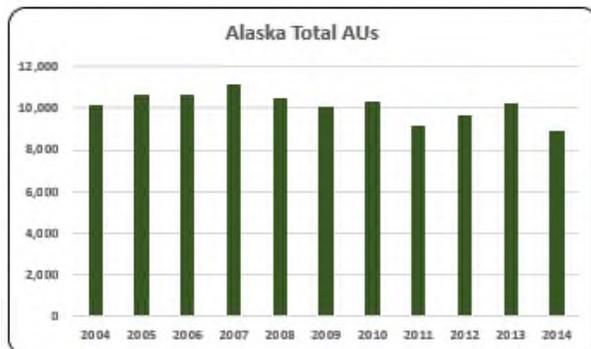
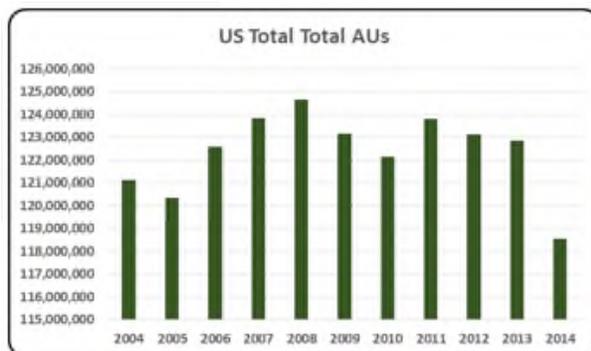


Alaska Animal Unit (AU) Trends

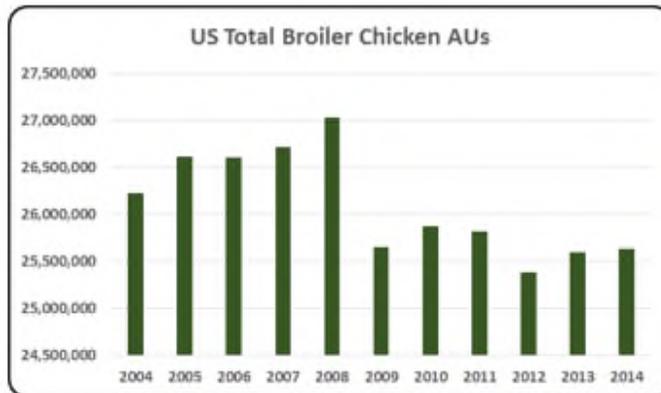
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Alaska. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Alaska and to give perspective on Alaska's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

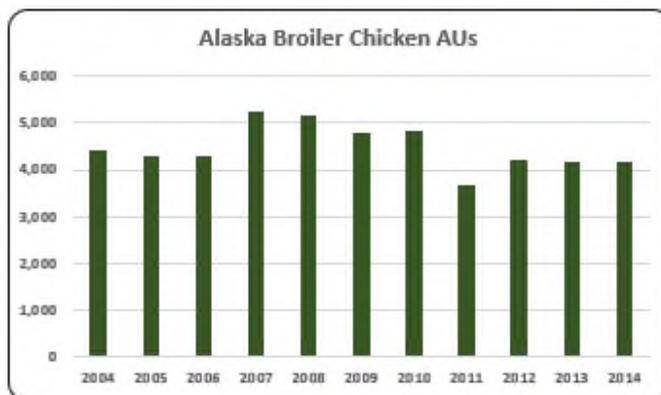
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Alaska, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (4.2 thousand AUs), Turkeys (2.3 thousand AUs), and Beef Cows (1.6 thousand AUs). Total animal units in Alaska during 2014 were 8.9 thousand AUs.



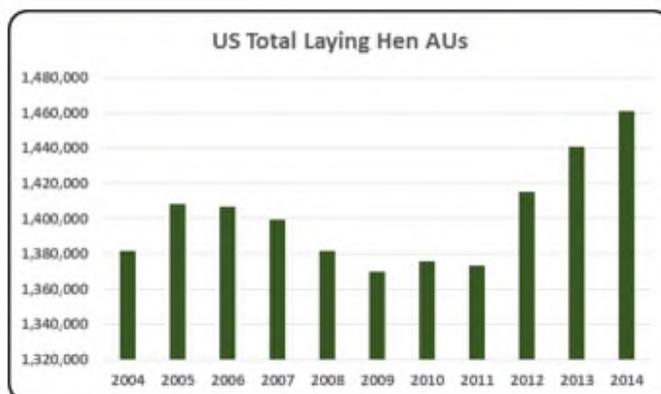
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- Alaska is one of the few states with very low animal production. There were 8,932 AUs in 2014 for all species included in this study, and the average AUs from 2004 to 2014 was 10,139.



- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



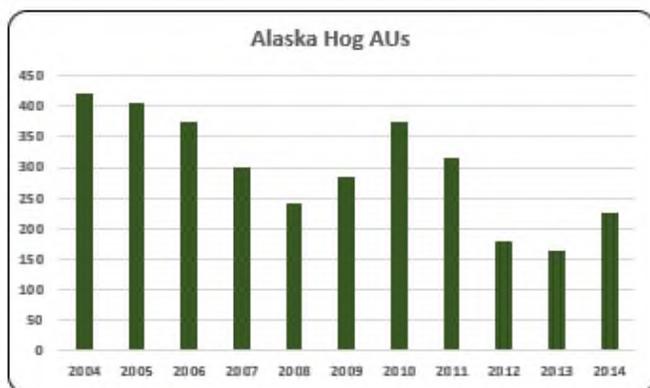
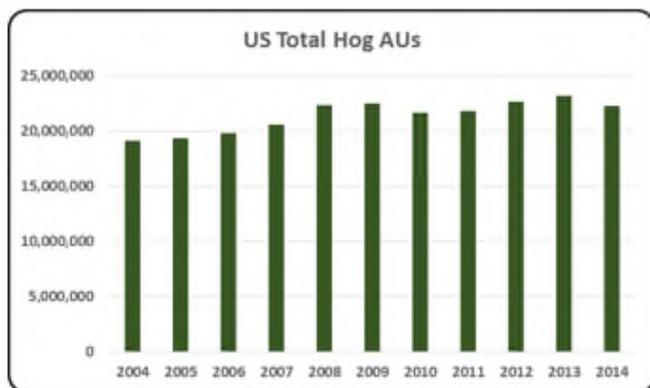
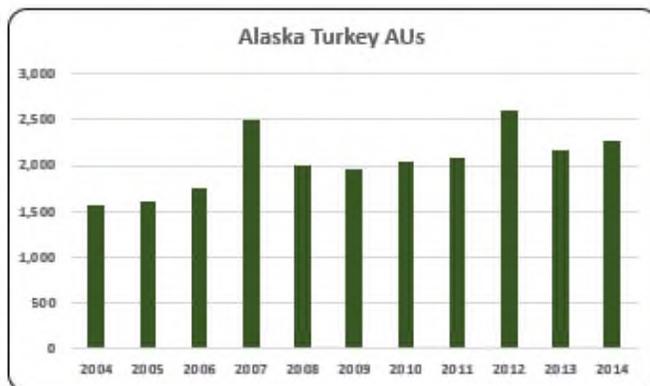
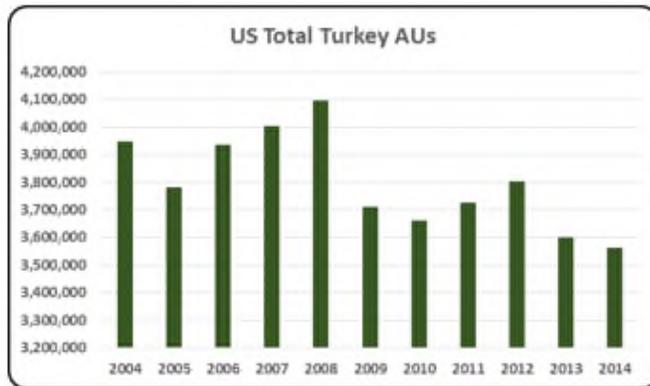
- Forty six percent (4,157) of all animal units in Alaska were in the broiler industry. The average broiler AUs during the decade was 4,470.



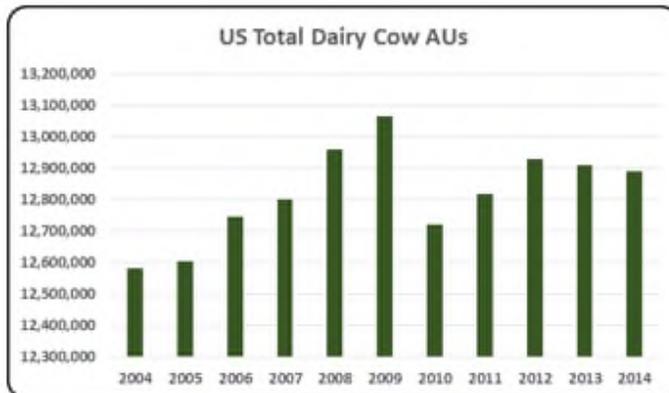
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



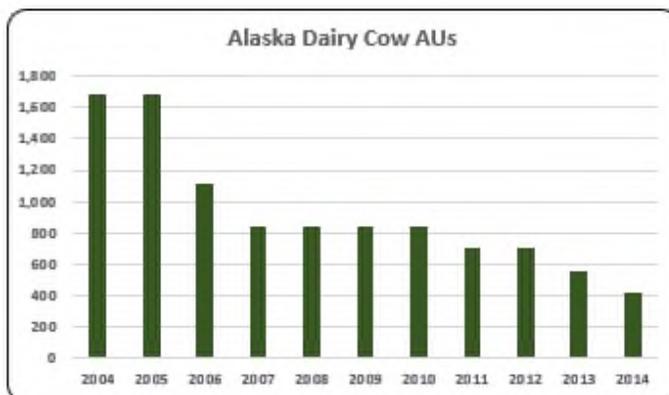
- Layer AUs in 2014 was equal to 258, representing 0.02% of all layers in the U.S during that year. On average there were only 255 layers from 2004 to 2014.



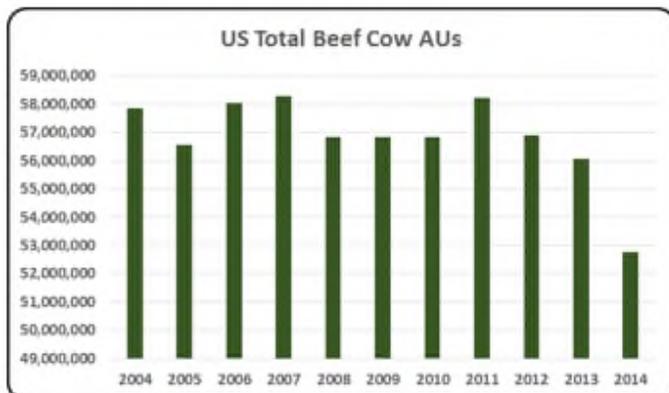
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- There were 2,267 turkey AUs in 2014 representing only 0.06% of all turkeys AUs in the U.S. during that year.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production in Alaska is minimal with only 225 AUs in 2014.



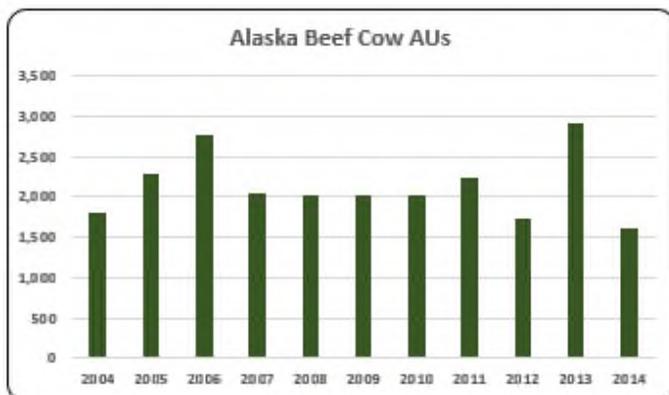
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- The number of dairy cows in the state has consistently decreased since 2004. Dairy cow AUs were 1,680 in 2004 compared to 420 in 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Alaska beef cow AUs averaged 2,134 from 2004 to 2014. Beef cow AUs decreased 45% from previous year's AUs.

Alaska Additional Information and Methodology

Animal agriculture is a small part of Alaska's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Alaska, of interest is the degree to which the industry impacts the Alaska economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Alaska animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Alaska's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Alaska which have occurred. As shown in this state report, Alaska has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Alaska. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Alaska Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Alaska's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Alaska, \$1.331 to \$1.426 million in total economic activity, \$0.192 to \$0.218 in household wages and 5 to 9 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.4262 | \$ 0.2007 | 6.0 |
| | Hogs, Pigs, and Other | \$ 1.3594 | \$ 0.2007 | 8.7 |
| | Poultry and Eggs | \$ 1.3311 | \$ 0.1915 | 5.2 |
| | Dairy | \$ 1.4124 | \$ 0.2176 | 6.9 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,815 | 2,295 | 2,775 | 2,055 | 2,010 | 2,010 | 2,010 | 2,250 | 1,725 | 2,925 | 1,605 |
| | Hog and Pig AUs | 420 | 405 | 375 | 300 | 240 | 285 | 375 | 315 | 180 | 165 | 225 |
| | Broiler AUs | 4,396 | 4,303 | 4,274 | 5,227 | 5,145 | 4,784 | 4,848 | 3,653 | 4,196 | 4,181 | 4,157 |
| | Turkey AUs | 1,572 | 1,612 | 1,752 | 2,507 | 2,004 | 1,963 | 2,044 | 2,081 | 2,602 | 2,170 | 2,267 |
| | Egg Layer AUs | 306 | 337 | 325 | 239 | 233 | 203 | 202 | 203 | 250 | 254 | 258 |
| | Dairy AUs | 1,680 | 1,680 | 1,120 | 840 | 840 | 840 | 840 | 700 | 700 | 560 | 420 |
| | Total Animal Units | 10,188 | 10,632 | 10,621 | 11,168 | 10,471 | 10,085 | 10,320 | 9,202 | 9,652 | 10,255 | 8,932 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 2,641 | \$ 3,137 | \$ 3,621 | \$ 1,444 | \$ 1,205 | \$ 2,162 | \$ 2,371 | \$ 2,563 | \$ 1,620 | \$ 1,021 | \$ 2,849 |
| | Hogs and Pigs (\$1,000) | \$ 441 | \$ 580 | \$ 480 | \$ 421 | \$ 378 | \$ 547 | \$ 586 | \$ 422 | \$ 272 | \$ 261 | \$ 401 |
| | Broilers (\$1,000) | \$ 3,697 | \$ 3,502 | \$ 2,707 | \$ 3,932 | \$ 4,047 | \$ 3,505 | \$ 3,689 | \$ 3,251 | \$ 4,180 | \$ 5,092 | \$ 5,342 |
| | Turkeys (\$1,000) | \$ 1,458 | \$ 1,546 | \$ 1,828 | \$ 2,891 | \$ 2,706 | \$ 1,815 | \$ 2,431 | \$ 2,727 | \$ 3,773 | \$ 2,485 | \$ 4,160 |
| | Eggs (\$1,000) | \$ 1,165 | \$ 705 | \$ 782 | \$ 1,283 | \$ 1,546 | \$ 1,100 | \$ 1,208 | \$ 1,324 | \$ 1,485 | \$ 1,678 | \$ 1,949 |
| | Milk (\$1,000) | \$ 3,008 | \$ 2,754 | \$ 1,970 | \$ 2,006 | \$ 1,699 | \$ 1,470 | \$ 1,732 | \$ 1,670 | \$ 1,368 | \$ 704 | \$ 767 |
| | Other | \$ 851 | \$ 826 | \$ 801 | \$ 776 | \$ 751 | \$ 726 | \$ 701 | \$ 676 | \$ 651 | \$ 626 | \$ 601 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 851 | \$ 826 | \$ 801 | \$ 776 | \$ 751 | \$ 726 | \$ 701 | \$ 676 | \$ 651 | \$ 626 | \$ 601 |
| | Total (\$1,000) | \$ 13,261 | \$ 13,051 | \$ 12,188 | \$ 12,753 | \$ 12,332 | \$ 11,326 | \$ 12,719 | \$ 12,633 | \$ 13,349 | \$ 11,867 | \$ 16,069 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 |
|--------------------------|--|--------------|---------------|---------------|---------------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 45 | 31 | 41 | 51 |
| | Cattle feedlots (112112) | 7 | 8 | 4 | 1 |
| | Dairy cattle and milk production (11212) | 12 | 15 | 6 | 6 |
| | Hog and pig farming (1122) | 16 | 13 | 14 | 9 |
| | Poultry and egg production (1123) | 10 | 14 | 32 | 26 |
| | Sheep and goat farming (1124) | 14 | 11 | 19 | 27 |
| | Animal aquaculture and other animal production (1125,1129) | 126 | 137 | 167 | 158 |
| Value of Sales (\$1,000) | Cattle and Calves | 1,639 | 759 | 768 | 1,085 |
| | Hogs and Pigs | 320 | 205 | 242 | 338 |
| | Poultry and Eggs | 32 | 104 | 207 | 353 |
| | Milk and Other Dairy Products | 2,776 | 3,246 | 1,487 | withheld |
| | Aquaculture | n/a | 20,807 | 28,540 | 29,774 |
| | Other (calculated) | 3,915 | 479 | 1,027 | withheld |
| | Total | 8,682 | 25,600 | 32,271 | 31,550 |
| Input Purchases | Livestock and poultry purchased | (Farms) 127 | 117 | 118 | 168 |
| | | \$1,000 | 1,291 | 569 | 303 |
| | Breeding livestock purchased | (Farms) n/a | 51 | 46 | 46 |
| | | \$1,000 | n/a | 432 | 107 |
| | Other livestock and poultry purchased | (Farms) n/a | 80 | 86 | 148 |
| | | \$1,000 | n/a | 137 | 196 |
| | Feed purchased | (Farms) 234 | 293 | 299 | 364 |
| | \$1,000 | 2,532 | 4,078 | 5,096 | 6,386 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 4,063 | \$ 572 | 17 | \$ 116 |
| | Hogs, Pigs, and Other | \$ 1,362 | \$ 201 | 9 | \$ 41 |
| | Poultry and Eggs | \$ 15,242 | \$ 2,193 | 59 | \$ 446 |
| | Dairy | \$ 1,083 | \$ 167 | 5 | \$ 34 |
| | Total | \$ 21,750 | \$ 3,133 | 90 | \$ 637 |
| Change from 2004 to 2014 | Cattle and Calves | \$ (657) | \$ (92) | (3) | \$ (19) |
| | Hogs, Pigs, and Other | \$ (839) | \$ (124) | (5) | \$ (25) |
| | Poultry and Eggs | \$ 4,698 | \$ 676 | 18 | \$ 137 |
| | Dairy | \$ (4,241) | \$ (653) | (21) | \$ (133) |
| | Total | \$ (1,039) | \$ (194) | (10) | \$ (39) |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.4262 | \$ 0.2007 | 6.0 | |
| | Hogs, Pigs, and Other | \$ 1.3594 | \$ 0.2007 | 8.7 | |
| | Poultry and Eggs | \$ 1.3311 | \$ 0.1915 | 5.2 | |
| | Dairy | \$ 1.4124 | \$ 0.2176 | 6.9 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 0.0% |
| | Total | | | | 20.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: ARIZONA

Arizona Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Arizona's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Arizona. The success of Arizona's animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Arizona during 2014 animal agriculture contributed:

- \$4.1 billion in economic output
- 25,330 jobs
- \$754.6 million in earnings
- \$185.4 million in income taxes paid at local, state, and federal levels
- \$42.0 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Arizona increased economic output by over \$1.2 billion, boosted household earnings by \$215.9 million, contributed 7,329 additional jobs and paid \$53.0 million in additional tax revenues.

Arizona's animal agriculture consumed about 66.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (24.5 thousand tons)
- Hogs (15.7 thousand tons)
- Companion Animals (11.4 thousand tons)

This report examines animal agriculture in Arizona over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Arizona, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Arizona and beyond.

Arizona Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Arizona's economy. In 2014, Arizona's animal agriculture contributed the following to the economy:

- About \$4.1 billion in economic output
- \$754.6 million in household earnings
- 25,330 jobs
- \$185.4 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Arizona's animal agriculture has:

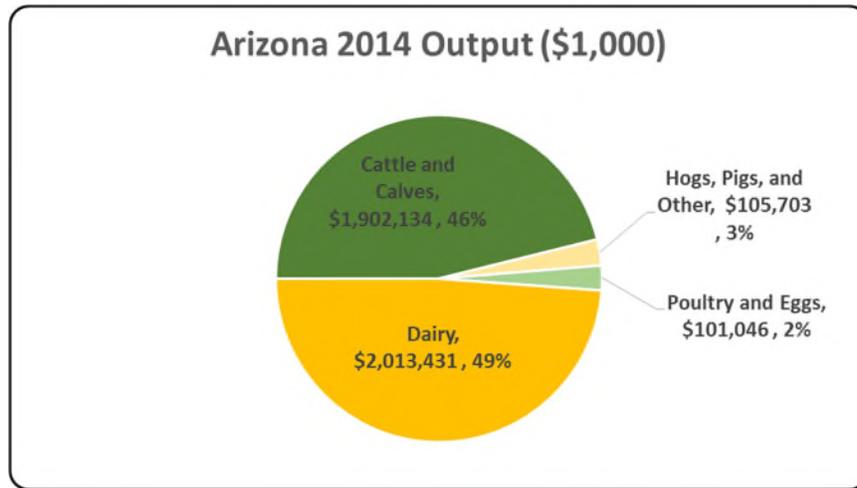
- Increased economic output by \$1.2 billion
- Boosted household earnings by \$215.9 million
- Added 7,329 jobs
- Paid an additional \$53.0 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 4,122,314 | \$ 1,170,411 | 39.65% |
| Earnings (\$1,000) | \$ 754,559 | \$ 215,885 | 40.08% |
| Employment (Jobs) | 25,330 | 7,329 | 40.72% |
| Income Taxes Paid (\$1,000) | \$ 185,395 | \$ 53,043 | 40.08% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 42,014 | | |

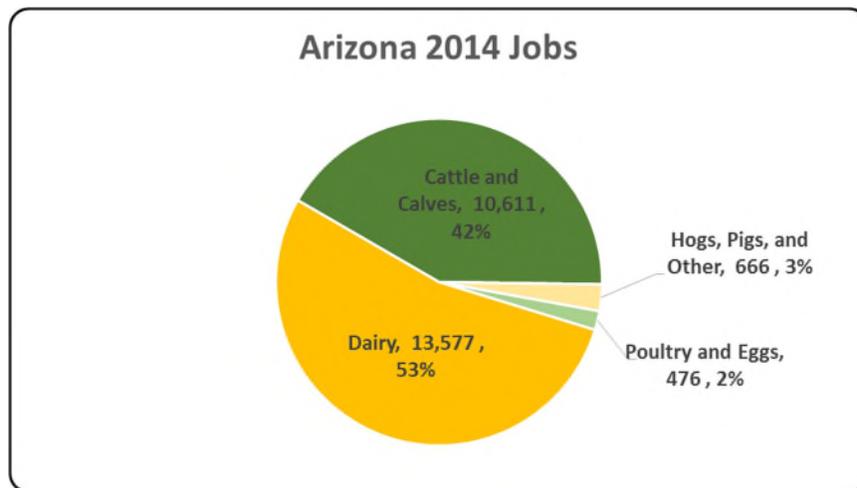
Arizona Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Arizona economy. Animal agriculture’s impact on Arizona total economic output is about \$4.1 billion.



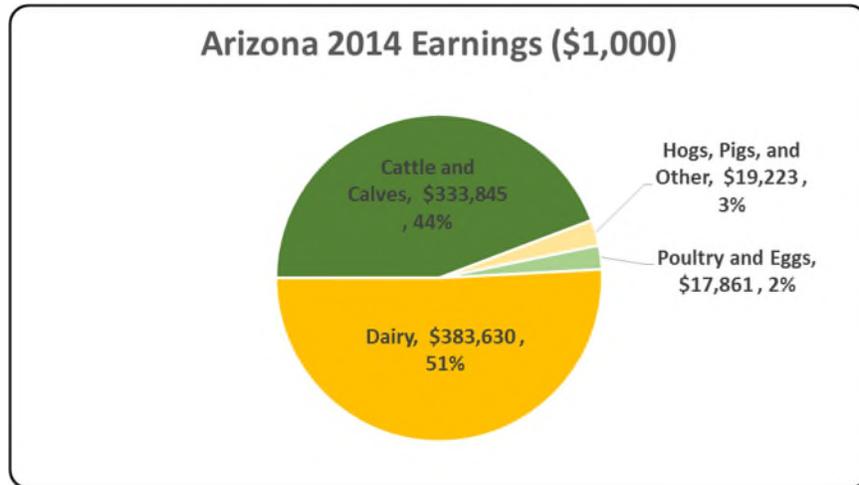
Arizona Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Arizona in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Arizona total jobs, contributing 25,330 jobs within and outside of animal agriculture.



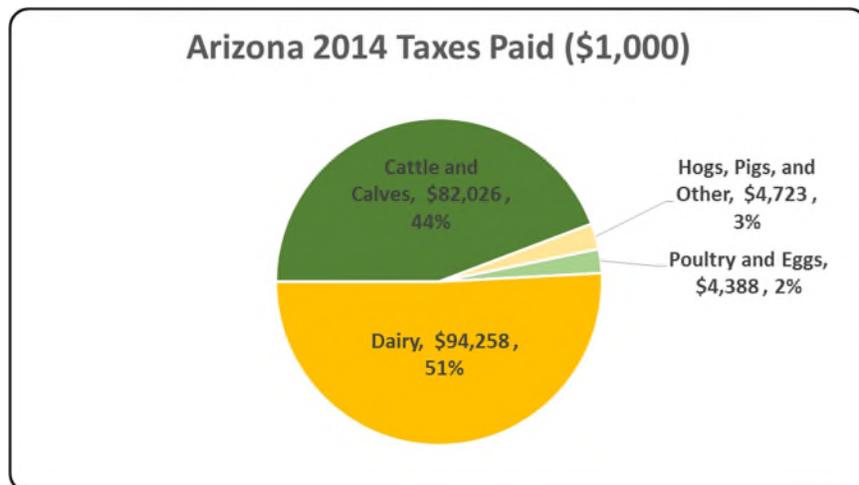
Arizona Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Arizona economy in terms of earnings. Arizona’s animal agriculture contributed about \$754.6 million to household earnings in 2014.



Arizona Taxes Paid by Animal Agriculture

Arizona’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$185.4 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$42.0 million in property taxes paid by all of Arizona agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



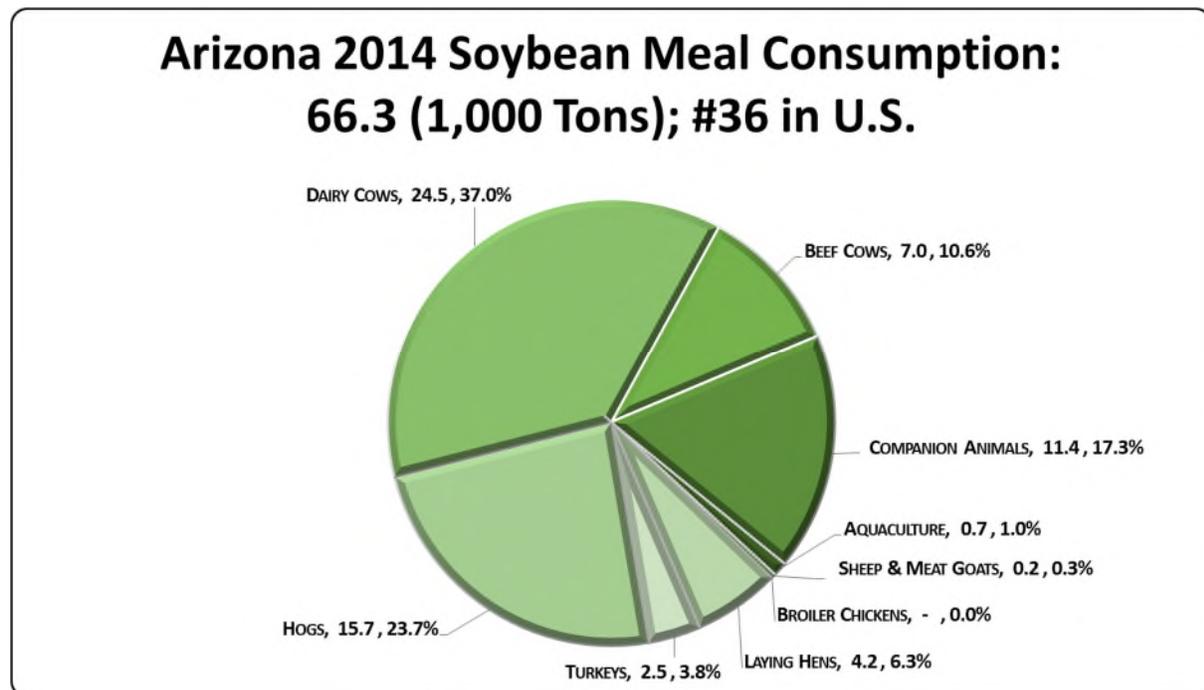
Arizona Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Arizona’s animal agriculture consumed almost 66.3 thousand tons of soybean meal in 2014, placing the state as #36 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (24.5 thousand tons)
- Hogs (15.7 thousand tons)
- Companion Animals (11.4 thousand tons)

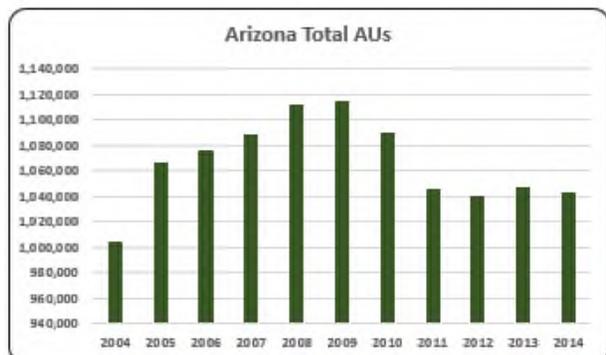
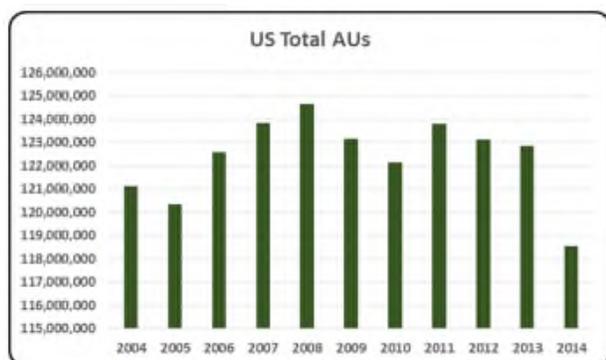


Arizona Animal Unit (AU) Trends

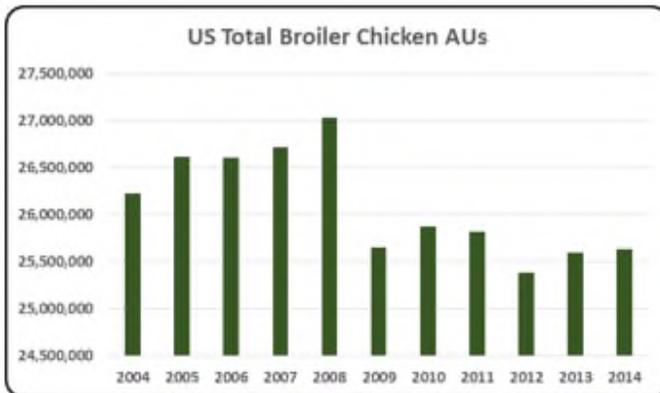
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Arizona. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Arizona and to give perspective on Arizona's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

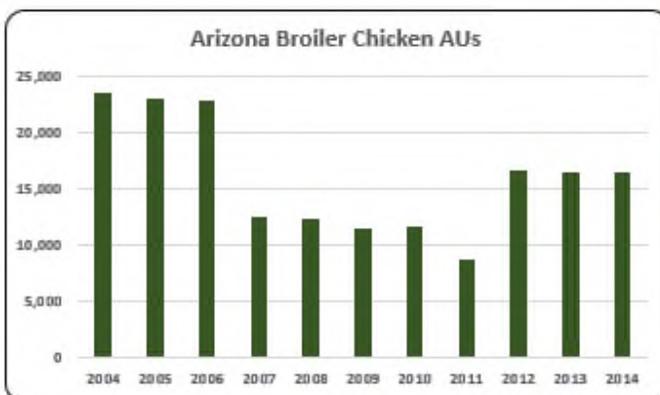
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Arizona, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (705.6 thousand AUs), Dairy Cows (268.8 thousand AUs), and Hogs (42.9 thousand AUs). Total animal units in Arizona during 2014 were 1,042.7 thousand AUs.



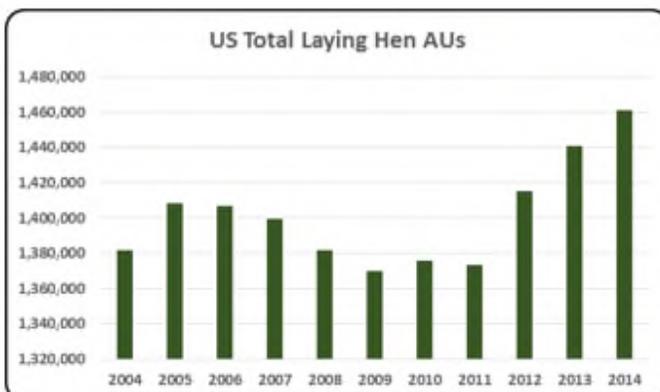
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- Arizona's AUs increased from 1,005 thousand in 2004 to 1,115 thousand in 2009, since then AUs have averaged about 1,054 thousand. The total AUs in Arizona reached 1,066 thousand in 2014.



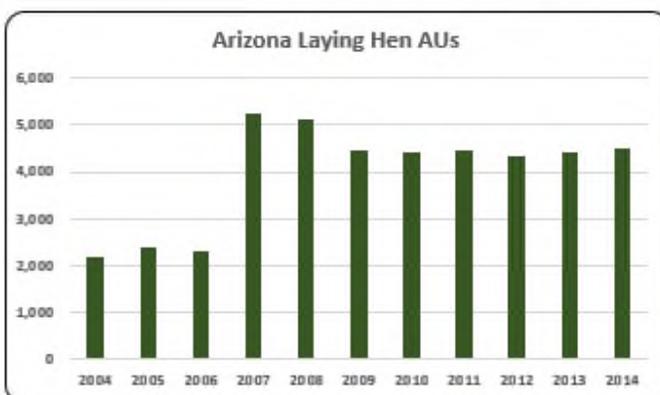
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



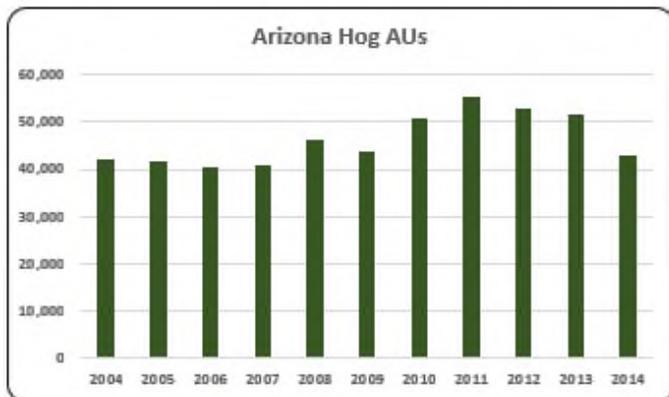
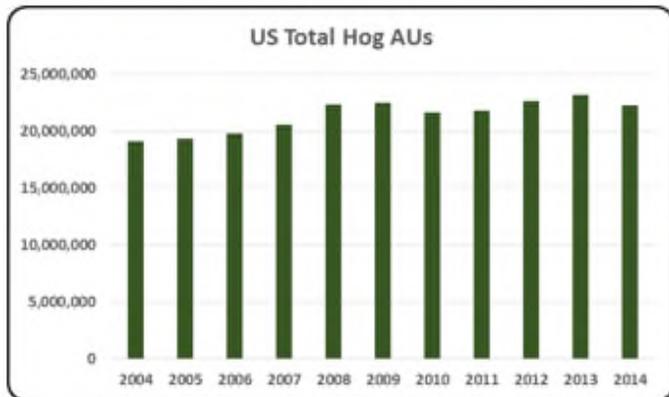
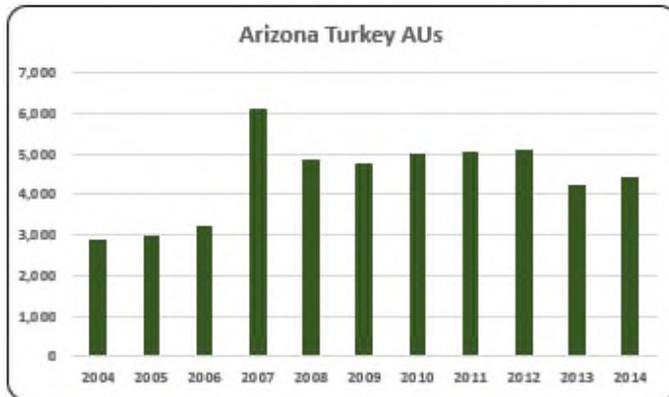
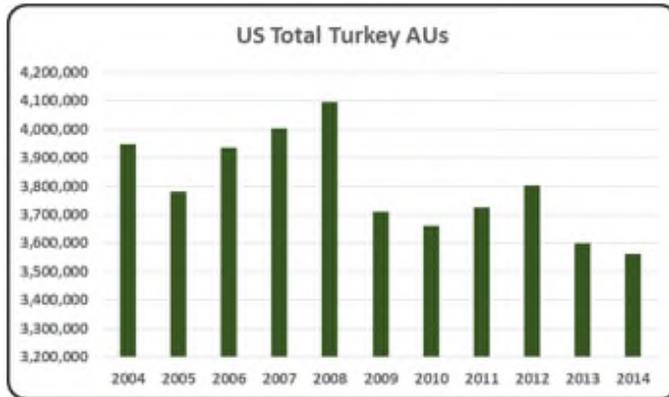
- The 2014 Arizona broiler AUs represented 1.6% (16,449 broiler AUs) of the total AUs in the state during the same year. Compared to the national level (25,632 thousand), Arizona’s 2014 broiler AUs represented only 0.06%.



- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



- Layer and turkey AUs are very small animal industries in Arizona, representing about 0.43% each of the total AUs in the state.

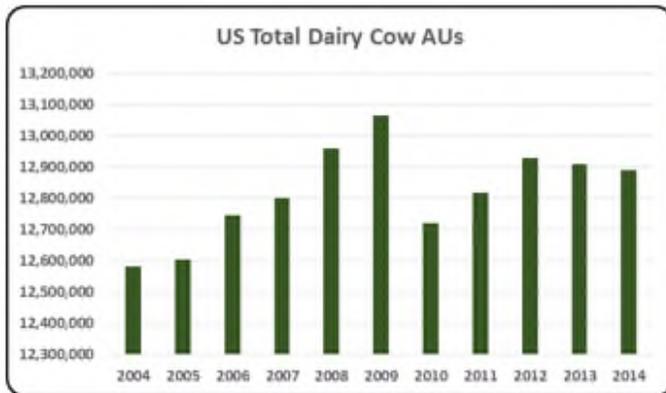


- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

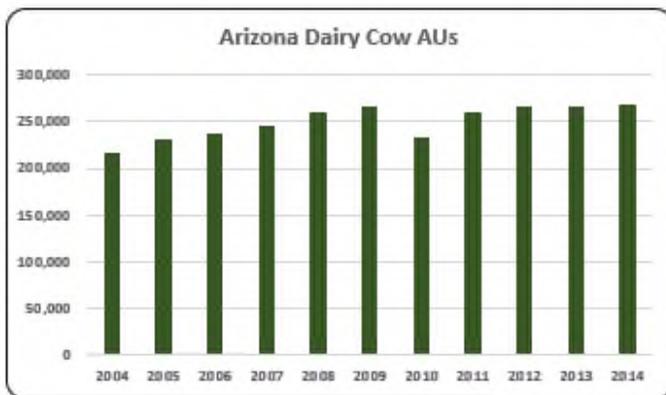
- Layer and turkey AUs are very small animal industries in Arizona, representing about 0.43% each of the total AUs in the state.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

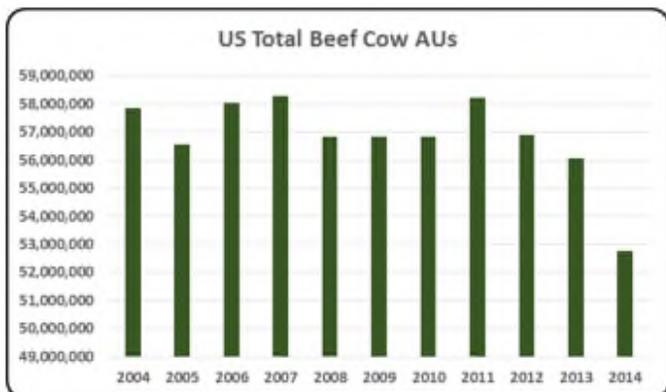
- As a third animal production in Arizona, hog AUs averaged 46,220 AUs. In 2014 hog AUs decreased 16.6% to 42,900 year-over-year, these were the lowest hog AUs since 2009 (43,800 hog AUs).



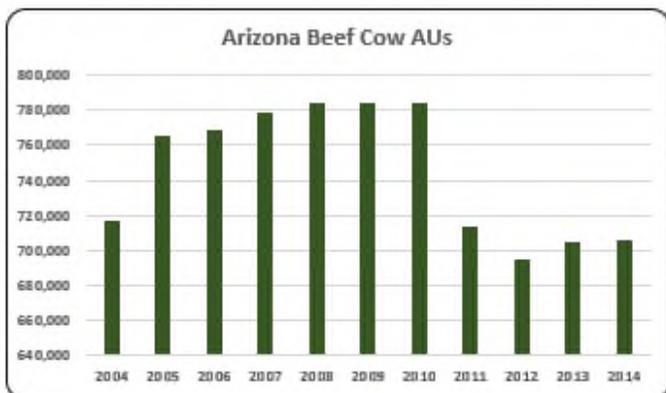
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- On average, there were 249,964 dairy cow AUs from 2004 to 2014. In 2014 dairy cow AUs reached a record number of 268,800 AUs.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow AUs represented 68% (705,600 AUs) of all AU in the state during 2014. Beef cow AUs increased slightly (0.1%) year-over-year but beef cow AUs were short by 73,300 AUs compared to the beef cow AUs in 2008 and 2009 (783,900 AUs).

Arizona Additional Information and Methodology

Animal agriculture is an important part of Arizona's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Arizona, of interest is the degree to which the industry impacts the Arizona economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Arizona animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Arizona's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Arizona which have occurred. As shown in this state report, Arizona has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Arizona. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Arizona Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Arizona's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Arizona, \$1.598 to \$2.261 million in total economic activity, \$0.283 to \$0.397 in household wages and 8 to 13 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.2614 | \$ 0.3969 | 12.6 |
| | Hogs, Pigs, and Other | \$ 1.6584 | \$ 0.3016 | 10.4 |
| | Poultry and Eggs | \$ 1.5982 | \$ 0.2825 | 7.5 |
| | Dairy | \$ 1.8469 | \$ 0.3519 | 12.5 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 717,300 | 765,900 | 768,750 | 778,650 | 783,900 | 783,900 | 783,900 | 713,250 | 695,100 | 704,700 | 705,600 |
| | Hog and Pig AUs | 42,000 | 41,850 | 40,500 | 40,950 | 46,200 | 43,800 | 50,850 | 55,200 | 52,725 | 51,450 | 42,900 |
| | Broiler AUs | 23,578 | 23,082 | 22,926 | 12,631 | 12,434 | 11,561 | 11,716 | 8,828 | 16,601 | 16,543 | 16,449 |
| | Turkey AUs | 2,902 | 2,976 | 3,234 | 6,110 | 4,884 | 4,784 | 4,983 | 5,072 | 5,095 | 4,250 | 4,439 |
| | Egg Layer AUs | 2,170 | 2,390 | 2,306 | 5,248 | 5,099 | 4,459 | 4,430 | 4,456 | 4,352 | 4,420 | 4,490 |
| | Dairy AUs | 217,000 | 231,000 | 238,000 | 245,000 | 259,000 | 266,000 | 233,800 | 259,000 | 266,000 | 266,000 | 268,800 |
| | Total Animal Units | 1,004,950 | 1,067,198 | 1,075,716 | 1,088,590 | 1,111,517 | 1,114,504 | 1,089,679 | 1,045,806 | 1,039,873 | 1,047,362 | 1,042,677 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 512,190 | \$ 498,648 | \$ 466,516 | \$ 425,743 | \$ 400,883 | \$ 321,152 | \$ 372,692 | \$ 594,015 | \$ 615,659 | \$ 624,078 | \$ 841,131 |
| | Hogs and Pigs (\$1,000) | \$ 38,806 | \$ 37,728 | \$ 32,393 | \$ 34,363 | \$ 41,713 | \$ 38,575 | \$ 51,594 | \$ 63,606 | \$ 55,619 | \$ 58,422 | \$ 54,303 |
| | Broilers (\$1,000) | \$ 19,831 | \$ 18,785 | \$ 14,517 | \$ 9,502 | \$ 9,779 | \$ 8,471 | \$ 8,916 | \$ 7,856 | \$ 16,537 | \$ 20,146 | \$ 21,134 |
| | Turkeys (\$1,000) | \$ 2,692 | \$ 2,855 | \$ 3,374 | \$ 7,046 | \$ 6,596 | \$ 4,424 | \$ 5,927 | \$ 6,647 | \$ 7,389 | \$ 4,866 | \$ 8,147 |
| | Eggs (\$1,000) | \$ 20,285 | \$ 12,280 | \$ 13,614 | \$ 22,347 | \$ 26,931 | \$ 19,168 | \$ 21,041 | \$ 23,070 | \$ 25,873 | \$ 29,231 | \$ 33,944 |
| | Milk (\$1,000) | \$ 572,422 | \$ 557,558 | \$ 506,112 | \$ 804,110 | \$ 765,424 | \$ 493,922 | \$ 660,009 | \$ 873,774 | \$ 793,408 | \$ 875,355 | \$ 1,090,168 |
| | Other | \$ 4,331 | \$ 5,112 | \$ 4,647 | \$ 5,255 | \$ 5,878 | \$ 6,797 | \$ 7,722 | \$ 7,818 | \$ 8,357 | \$ 8,896 | \$ 9,435 |
| | Sheep and Lambs (\$1,000) | \$ 4,331 | \$ 4,550 | \$ 3,418 | \$ 3,358 | \$ 3,314 | \$ 3,566 | \$ 3,824 | \$ 3,253 | \$ 3,124 | \$ 2,996 | \$ 2,868 |
| | Aquaculture (\$1,000) | \$ - | \$ 562 | \$ 1,229 | \$ 1,897 | \$ 2,564 | \$ 3,231 | \$ 3,898 | \$ 4,566 | \$ 5,233 | \$ 5,900 | \$ 6,567 |
| | Total (\$1,000) | \$ 1,170,558 | \$ 1,132,966 | \$ 1,041,173 | \$ 1,308,366 | \$ 1,257,205 | \$ 892,509 | \$ 1,127,901 | \$ 1,576,786 | \$ 1,522,842 | \$ 1,620,994 | \$ 2,058,262 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|----------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 2,242 | 2,067 | 4,901 | 4,201 | |
| | Cattle feedlots (112112) | 100 | 61 | 65 | 14 | |
| | Dairy cattle and milk production (11212) | 114 | 140 | 146 | 102 | |
| | Hog and pig farming (1122) | 49 | 73 | 86 | 213 | |
| | Poultry and egg production (1123) | 79 | 107 | 468 | 267 | |
| | Sheep and goat farming (1124) | 143 | 230 | 2,513 | 4,593 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,087 | 1,874 | 3,056 | 5,506 | |
| Value of Sales (\$1,000) | Cattle and Calves | 366,250 | 403,959 | 585,479 | 700,307 | |
| | Hogs and Pigs | 20,860 | withheld | withheld | withheld | |
| | Poultry and Eggs | 5,322 | withheld | withheld | withheld | |
| | Milk and Other Dairy Products | 282,845 | 352,784 | 634,509 | 762,957 | |
| | Aquaculture | 1,718 | 755 | 2,713 | 5,363 | |
| | Other (calculated) | 17,819 | 50,174 | 98,837 | 11,276 | |
| | Total | 694,814 | 807,672 | 1,321,538 | 1,479,903 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 1,852 | 1,631 | 2,283 | 3,226 | |
| | | \$1,000 | 149,969 | 171,369 | 315,343 | 166,502 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 954 | 1,374 | 1,817 | |
| | | \$1,000 | <i>n/a</i> | 21,233 | 46,303 | 20,253 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 869 | 1,257 | 1,783 | |
| | | \$1,000 | <i>n/a</i> | 150,137 | 269,040 | 146,249 |
| | Feed purchased | (Farms) 3,260 | 4,524 | 12,611 | 16,346 | |
| | | \$1,000 | 263,765 | 307,212 | 617,035 | 795,229 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,902,134 | \$ 333,845 | 10,611 | \$ 82,026 |
| | Hogs, Pigs, and Other | \$ 105,703 | \$ 19,223 | 666 | \$ 4,723 |
| | Poultry and Eggs | \$ 101,046 | \$ 17,861 | 476 | \$ 4,388 |
| | Dairy | \$ 2,013,431 | \$ 383,630 | 13,577 | \$ 94,258 |
| | Total | \$ 4,122,314 | \$ 754,559 | 25,330 | \$ 185,395 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 450,554 | \$ 79,077 | 2,513 | \$ 19,429 |
| | Hogs, Pigs, and Other | \$ 16,048 | \$ 2,919 | 101 | \$ 717 |
| | Poultry and Eggs | \$ 15,304 | \$ 2,705 | 72 | \$ 665 |
| | Dairy | \$ 688,504 | \$ 131,184 | 4,643 | \$ 32,232 |
| | Total | \$ 1,170,411 | \$ 215,885 | 7,329 | \$ 53,043 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.2614 | \$ 0.3969 | 12.6 | |
| | Hogs, Pigs, and Other | \$ 1.6584 | \$ 0.3016 | 10.4 | |
| | Poultry and Eggs | \$ 1.5982 | \$ 0.2825 | 7.5 | |
| | Dairy | \$ 1.8469 | \$ 0.3519 | 12.5 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 4.2% | |
| | Total | | | 24.6% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: ARKANSAS

Arkansas Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Arkansas's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Arkansas. The success of Arkansas animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Arkansas during 2014 animal agriculture contributed:

- \$16 billion in economic output
- 86,072 jobs
- \$2.7 billion in earnings
- \$731.1 million in income taxes paid at local, state, and federal levels
- \$86.7 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Arkansas increased economic output by over \$1.6 billion, boosted household earnings by \$265.5 million, contributed 8,084 additional jobs and paid \$72.6 million in additional tax revenues.

Arkansas's animal agriculture consumed about 1.8 million tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (1.4 million tons)
- Turkeys (254.2 thousand tons)
- Hogs (51.3 thousand tons)

This report examines animal agriculture in Arkansas over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Arkansas, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Arkansas and beyond.

Arkansas Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Arkansas's economy. In 2014, Arkansas's animal agriculture contributed the following to the economy:

- About \$16 billion in economic output
- \$2.7 billion in household earnings
- 86,072 jobs
- \$731.1 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Arkansas's animal agriculture has:

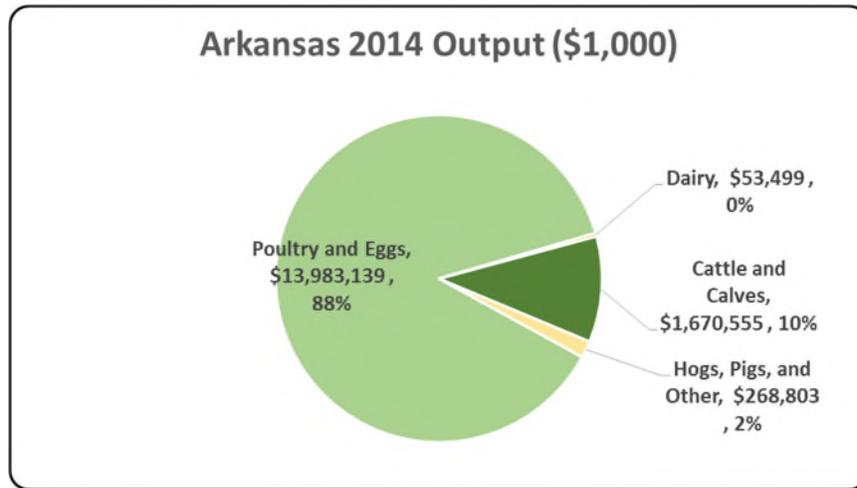
- Increased economic output by \$1.6 billion
- Boosted household earnings by \$265.5 million
- Added 8,084 jobs
- Paid an additional \$72.6 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 15,975,996 | \$ 1,593,712 | 11.08% |
| Earnings (\$1,000) | \$ 2,675,192 | \$ 265,489 | 11.02% |
| Employment (Jobs) | 86,072 | 8,084 | 10.37% |
| Income Taxes Paid (\$1,000) | \$ 731,130 | \$ 72,558 | 11.02% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 86,682 | | |

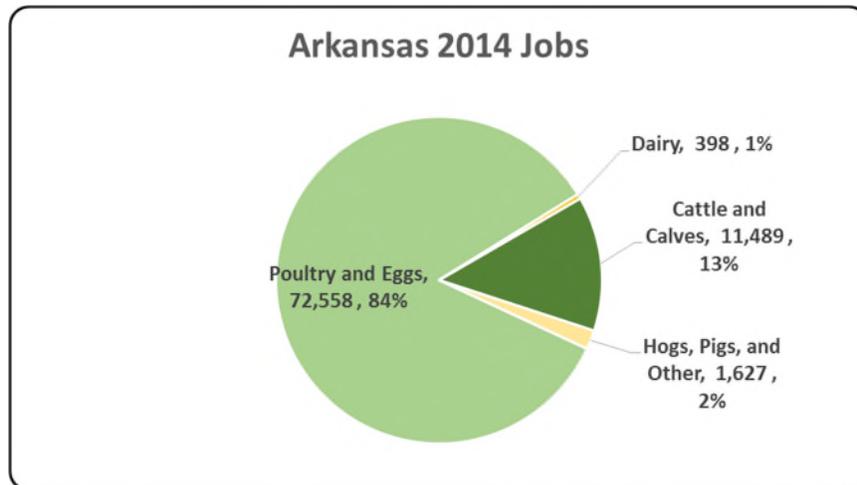
Arkansas Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Arkansas economy. Animal agriculture’s impact on Arkansas total economic output is about \$16 billion.



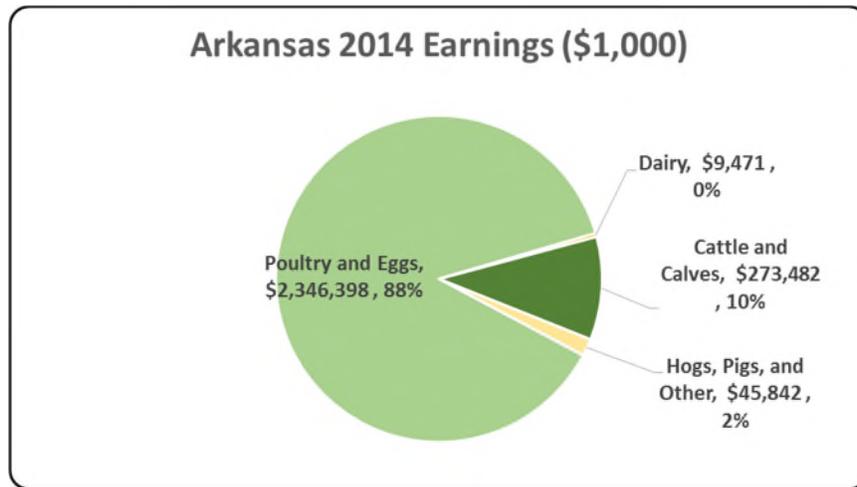
Arkansas Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Arkansas in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Arkansas total jobs, contributing 86,072 jobs within and outside of animal agriculture.



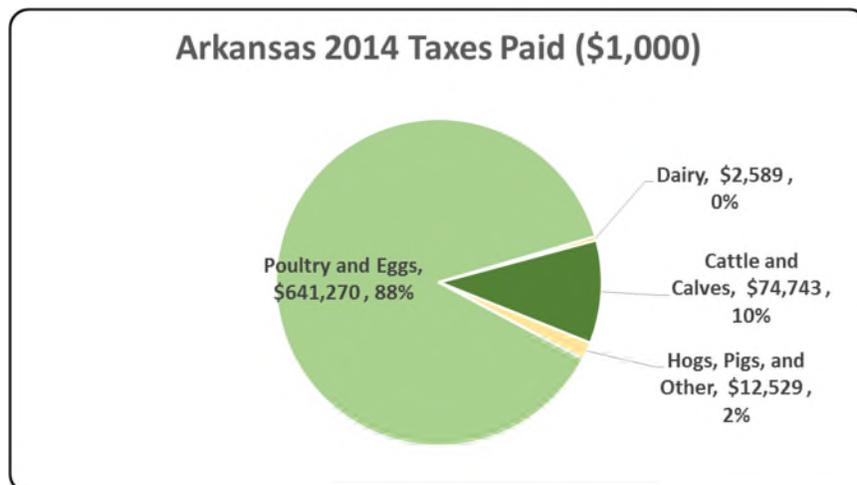
Arkansas Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Arkansas economy in terms of earnings. Arkansas’s animal agriculture contributed about \$2.7 billion to household earnings in 2014.



Arkansas Taxes Paid by Animal Agriculture

Arkansas’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$731.1 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$86.7 million in property taxes paid by all of Arkansas agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



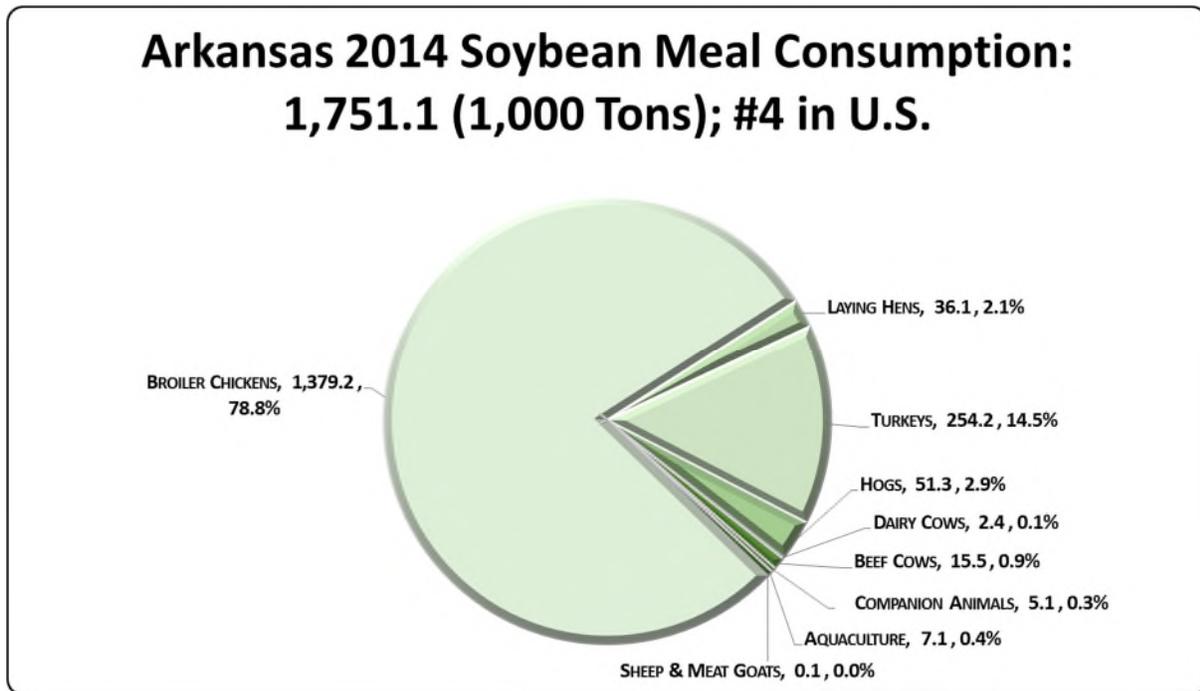
Arkansas Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Arkansas’s animal agriculture consumed almost 1.8 million tons of soybean meal in 2014, placing the state as #4 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (1.4 million tons)
- Turkeys (254.2 thousand tons)
- Hogs (51.3 thousand tons)

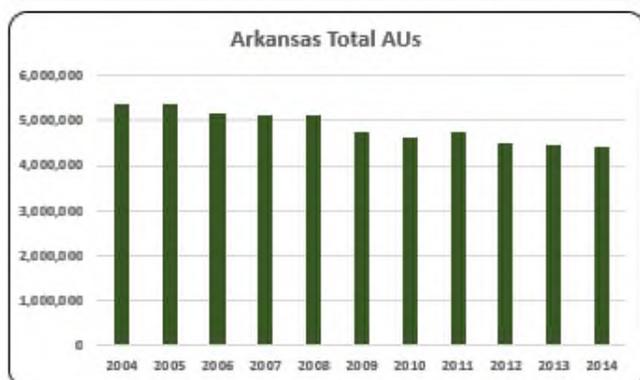
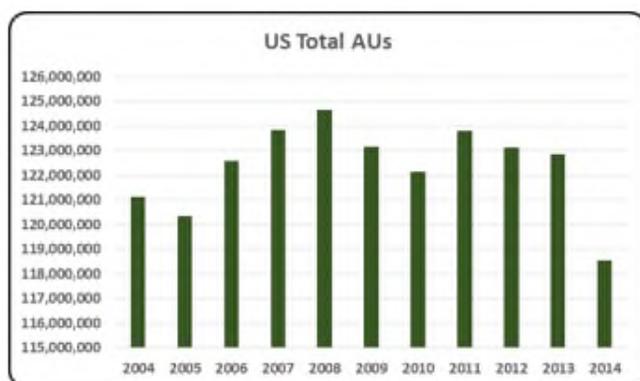


Arkansas Animal Unit (AU) Trends

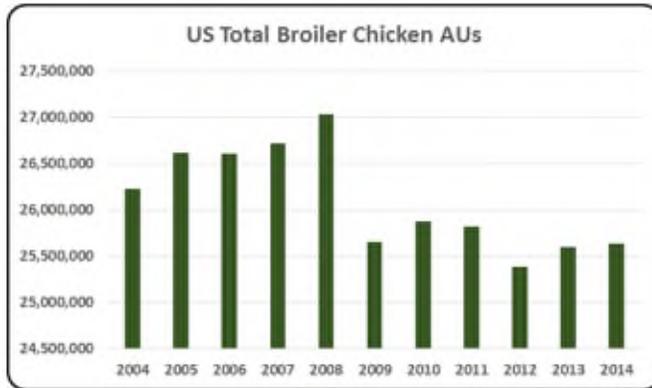
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Arkansas. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Arkansas and to give perspective on Arkansas's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

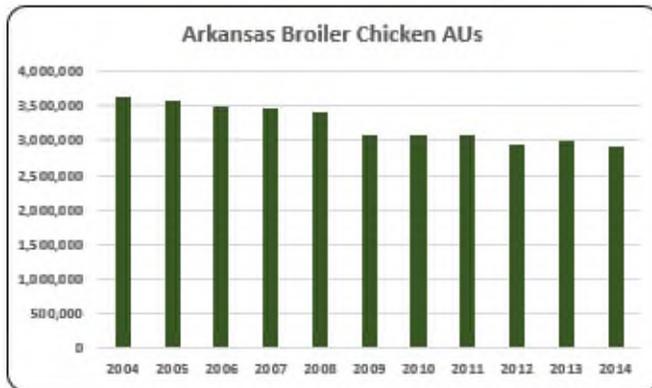
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Arkansas, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (2,914.8 thousand AUs), Beef Cows (827.0 thousand AUs), and Turkeys (449.9 thousand AUs). Total animal units in Arkansas during 2014 were 4,422.1 thousand AUs.



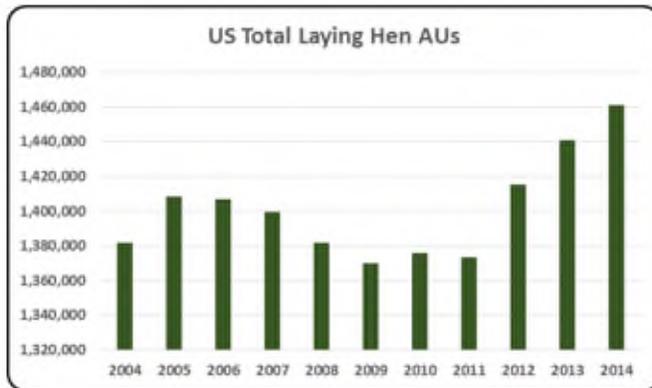
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- 3.7% of the total U.S. AUs in 2014 (118,550 thousand) were in Arkansas. Overall AUs in Arkansas have been decreasing over the last ten years from 5,358 thousand in 2004 to 4,422 thousand in 2014.



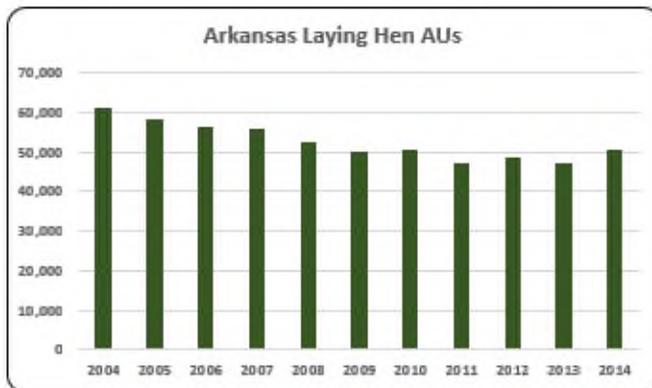
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



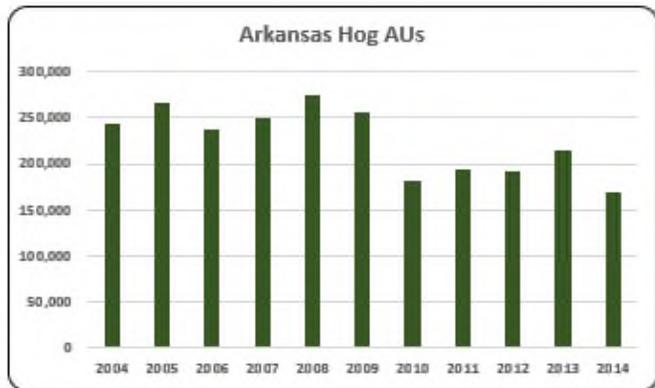
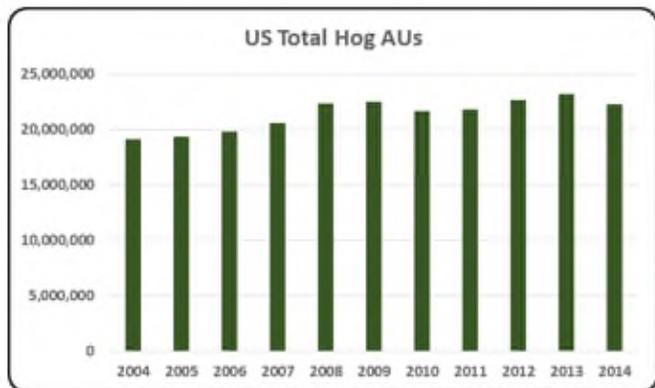
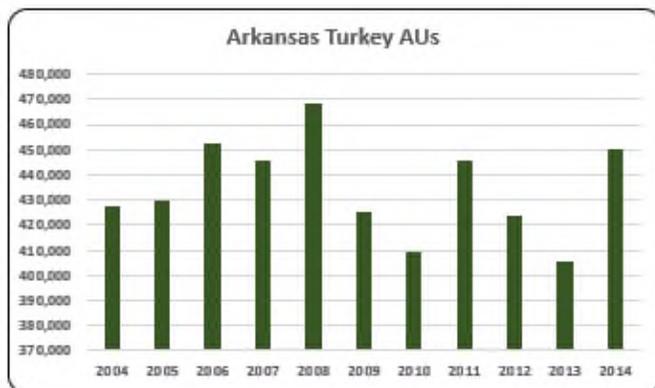
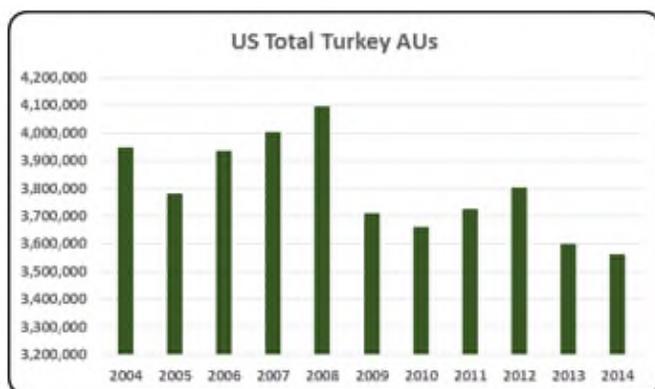
- The broiler production is the largest animal production in Arkansas representing about 66% of all AUs in the state in 2014 and 11.4% of all broiler AUs in the U.S. last year.



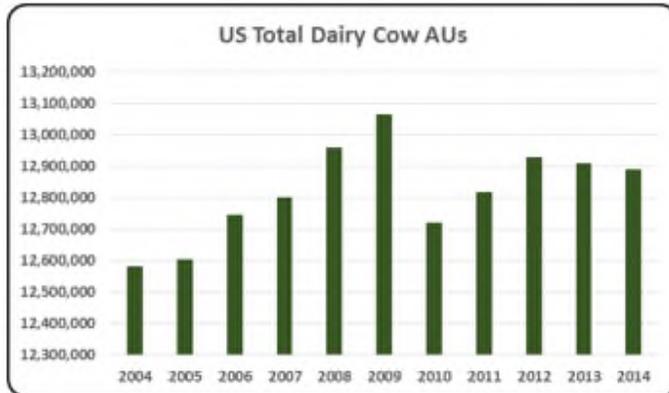
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



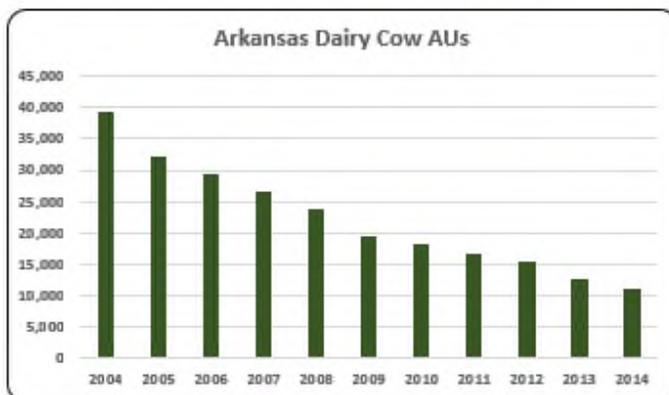
- Layer AUs rose 6.7% to 50,450 layer AUs in 2014 relative to 2013. Layer AUs numbers remained below the levels in 2004 (61,164), the highest level of layer AUs of the decade (2004 to 2014).



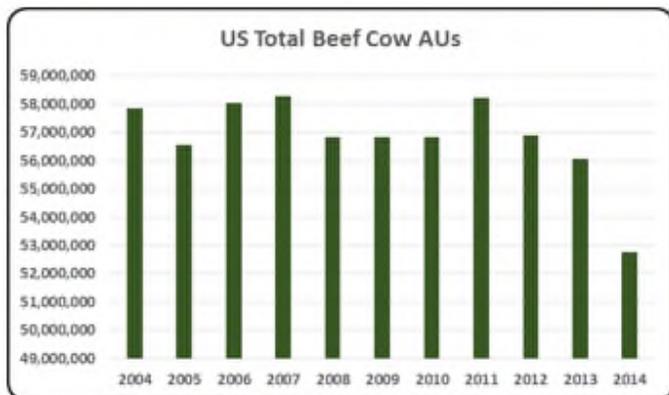
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey AUs in 2014 represented 10.2% (449,855) of total AUs in the state during 2014 and increased 10.9% from the previous year.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog AUs decreased 21.3% to 168,900 AUs relative to the previous year. Overall, hog AUs represented 3.8% of all AUs in the state.



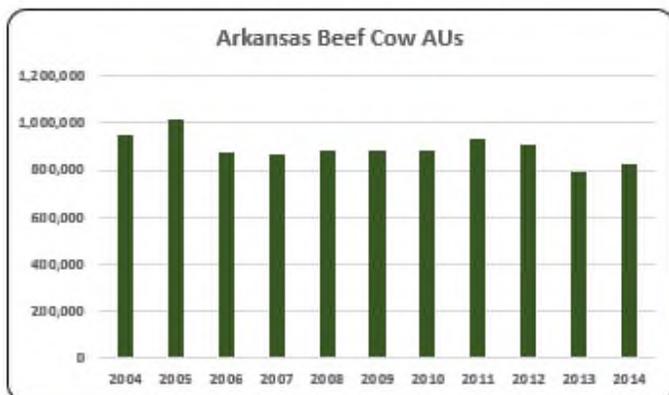
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow AUs have consistently decreased throughout the decade from 39,200 in 2004 to 11,200 in 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production in Arkansas is the second largest animal production in the state with an average of 892,595 beef cow AUs during the last ten years (2004-2014).

Arkansas Additional Information and Methodology

Animal agriculture is an important part of Arkansas's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Arkansas, of interest is the degree to which the industry impacts the Arkansas economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Arkansas animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Arkansas's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Arkansas which have occurred. As shown in this state report, Arkansas has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Arkansas. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Arkansas Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Arkansas's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Arkansas, \$1.945 to \$2.936 million in total economic activity, \$0.332 to \$0.493 in household wages and 12 to 18 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.6749 | \$ 0.4379 | 18.4 |
| | Hogs, Pigs, and Other | \$ 1.9450 | \$ 0.3317 | 11.8 |
| | Poultry and Eggs | \$ 2.9362 | \$ 0.4927 | 15.2 |
| | Dairy | \$ 2.1854 | \$ 0.3869 | 16.3 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 952,350 | 1,012,500 | 876,750 | 867,900 | 884,250 | 884,250 | 884,250 | 936,150 | 904,200 | 789,000 | 826,950 |
| | Hog and Pig AUs | 243,600 | 265,500 | 237,750 | 248,700 | 274,500 | 255,000 | 181,800 | 193,800 | 192,600 | 214,650 | 168,900 |
| | Broiler AUs | 3,634,681 | 3,577,641 | 3,491,875 | 3,458,395 | 3,420,365 | 3,092,179 | 3,070,820 | 3,086,550 | 2,933,648 | 2,994,828 | 2,914,767 |
| | Turkey AUs | 427,500 | 429,757 | 452,480 | 445,427 | 468,010 | 424,942 | 409,602 | 445,508 | 423,624 | 405,521 | 449,855 |
| | Egg Layer AUs | 61,164 | 58,236 | 56,264 | 55,840 | 52,300 | 50,076 | 50,448 | 47,288 | 48,496 | 47,266 | 50,450 |
| | Dairy AUs | 39,200 | 32,200 | 29,400 | 26,600 | 23,800 | 19,600 | 18,200 | 16,800 | 15,400 | 12,600 | 11,200 |
| | Total Animal Units | 5,358,495 | 5,375,835 | 5,144,518 | 5,102,862 | 5,123,225 | 4,726,047 | 4,615,120 | 4,726,096 | 4,517,968 | 4,463,864 | 4,422,121 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 461,678 | \$ 472,815 | \$ 474,407 | \$ 483,335 | \$ 423,360 | \$ 415,817 | \$ 432,186 | \$ 486,144 | \$ 485,745 | \$ 474,912 | \$ 624,530 |
| | Hogs and Pigs (\$1,000) | \$ 83,170 | \$ 97,763 | \$ 76,747 | \$ 84,903 | \$ 89,283 | \$ 75,690 | \$ 80,809 | \$ 95,731 | \$ 79,885 | \$ 104,985 | \$ 83,396 |
| | Broilers (\$1,000) | \$ 2,731,300 | \$ 2,651,796 | \$ 2,198,910 | \$ 2,617,566 | \$ 2,934,800 | \$ 2,641,460 | \$ 2,861,875 | \$ 2,687,720 | \$ 2,879,200 | \$ 3,628,889 | \$ 3,830,154 |
| | Turkeys (\$1,000) | \$ 226,718 | \$ 255,645 | \$ 304,200 | \$ 320,488 | \$ 348,099 | \$ 284,200 | \$ 341,992 | \$ 413,940 | \$ 416,089 | \$ 372,400 | \$ 449,820 |
| | Eggs (\$1,000) | \$ 358,280 | \$ 352,645 | \$ 335,499 | \$ 364,490 | \$ 427,404 | \$ 372,702 | \$ 366,173 | \$ 406,514 | \$ 438,769 | \$ 454,913 | \$ 482,351 |
| | Milk (\$1,000) | \$ 52,649 | \$ 45,892 | \$ 35,346 | \$ 43,120 | \$ 37,014 | \$ 22,110 | \$ 26,163 | \$ 29,601 | \$ 24,472 | \$ 21,840 | \$ 24,480 |
| | Other | \$ 116,735 | \$ 110,542 | \$ 104,349 | \$ 98,156 | \$ 91,963 | \$ 85,771 | \$ 79,578 | \$ 73,385 | \$ 67,192 | \$ 60,999 | \$ 54,806 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 116,735 | \$ 110,542 | \$ 104,349 | \$ 98,156 | \$ 91,963 | \$ 85,771 | \$ 79,578 | \$ 73,385 | \$ 67,192 | \$ 60,999 | \$ 54,806 |
| | Total (\$1,000) | \$ 4,030,530 | \$ 3,987,098 | \$ 3,529,458 | \$ 4,012,058 | \$ 4,351,923 | \$ 3,897,750 | \$ 4,188,776 | \$ 4,193,035 | \$ 4,391,352 | \$ 5,118,938 | \$ 5,549,537 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 24,329 | 23,888 | 22,854 | 22,009 | |
| | Cattle feedlots (112112) | 703 | 781 | 65 | 3 | |
| | Dairy cattle and milk production (11212) | 637 | 348 | 291 | 106 | |
| | Hog and pig farming (1122) | 582 | 444 | 396 | 228 | |
| | Poultry and egg production (1123) | 4,948 | 4,737 | 4,212 | 3,298 | |
| | Sheep and goat farming (1124) | 184 | 419 | 775 | 1,111 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,922 | 4,406 | 4,922 | 4,148 | |
| Value of Sales (\$1,000) | Cattle and Calves | 383,466 | 421,226 | 625,996 | 766,476 | |
| | Hogs and Pigs | 218,626 | 123,803 | 84,202 | 47,178 | |
| | Poultry and Eggs | 2,605,644 | 2,617,592 | 3,716,164 | 4,011,725 | |
| | Milk and Other Dairy Products | 78,845 | 54,049 | 44,770 | 28,225 | |
| | Aquaculture | 84,120 | 92,638 | 118,744 | 67,453 | |
| | Other (calculated) | 10,016 | 20,706 | 17,957 | 8,123 | |
| | Total | 3,380,717 | 3,330,014 | 4,607,833 | 4,929,180 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 14,619 | 15,183 | 12,921 | 12,996 | |
| | | \$1,000 | 467,737 | 515,620 | 828,459 | 891,909 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 8,543 | 7,012 | 7,686 | |
| | | \$1,000 | <i>n/a</i> | 22,752 | 49,799 | 108,357 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 8,638 | 7,713 | 7,155 | |
| | | \$1,000 | <i>n/a</i> | 492,868 | 778,660 | 783,552 |
| | Feed purchased | (Farms) 29,654 | 34,143 | 30,394 | 32,540 | |
| | | \$1,000 | 1,654,949 | 1,250,849 | 2,023,611 | 2,617,016 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,670,555 | \$ 273,482 | 11,489 | \$ 74,743 |
| | Hogs, Pigs, and Other | \$ 268,803 | \$ 45,842 | 1,627 | \$ 12,529 |
| | Poultry and Eggs | \$ 13,983,139 | \$ 2,346,398 | 72,558 | \$ 641,270 |
| | Dairy | \$ 53,499 | \$ 9,471 | 398 | \$ 2,589 |
| | Total | \$ 15,975,996 | \$ 2,675,192 | 86,072 | \$ 731,130 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 122,883 | \$ 20,117 | 845 | \$ 5,498 |
| | Hogs, Pigs, and Other | \$ (218,473) | \$ (37,258) | (1,323) | \$ (10,183) |
| | Poultry and Eggs | \$ 1,780,000 | \$ 298,687 | 9,236 | \$ 81,631 |
| | Dairy | \$ (90,697) | \$ (16,057) | (674) | \$ (4,388) |
| | Total | \$ 1,593,712 | \$ 265,489 | 8,084 | \$ 72,558 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.6749 | \$ 0.4379 | 18.4 | |
| | Hogs, Pigs, and Other | \$ 1.9450 | \$ 0.3317 | 11.8 | |
| | Poultry and Eggs | \$ 2.9362 | \$ 0.4927 | 15.2 | |
| | Dairy | \$ 2.1854 | \$ 0.3869 | 16.3 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 7.0% |
| | Total | | | | 27.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: CALIFORNIA

California Executive Summary

The use of soybean meal as a key feed ingredient is an important part of California's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in California. The success of California animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of California during 2014 animal agriculture contributed:

- \$27.3 billion in economic output
- 124,322 jobs
- \$5.2 billion in earnings
- \$1.5 billion in income taxes paid at local, state, and federal levels
- \$827.6 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in California increased economic output by over \$7.8 billion, boosted household earnings by \$1.5 billion, contributed 35,676 additional jobs and paid \$437.7 million in additional tax revenues.

California's animal agriculture consumed about 668.4 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (227.8 thousand tons)
- Broilers (163.4 thousand tons)
- Egg-Laying Hens (105.9 thousand tons)

This report examines animal agriculture in California over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in California, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a contributor to the economic well-being of the people of California and beyond.

California Economic Impact of Animal Agriculture

Animal agriculture is an important part of California's economy. In 2014, California's animal agriculture contributed the following to the economy:

- About \$27,311.3 million in economic output
- \$5,168.7 million in household earnings
- 124,322 jobs
- \$1,531.5 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade California's animal agriculture has:

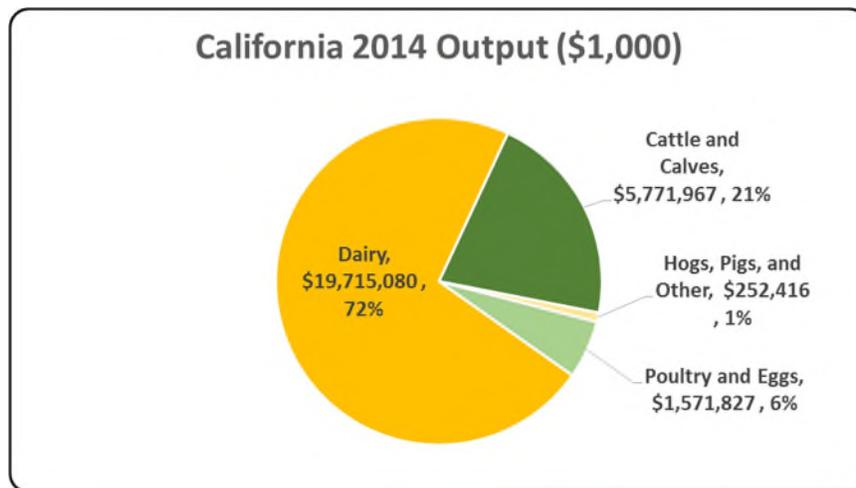
- Increased economic output by \$7,819.5 million
- Boosted household earnings by \$1,477.4 million
- Added 35,676 jobs
- Paid an additional \$437.7 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 27,311,291 | \$ 7,819,489 | 40.12% |
| Earnings (\$1,000) | \$ 5,168,747 | \$ 1,477,365 | 40.02% |
| Employment (Jobs) | 124,322 | 35,676 | 40.25% |
| Income Taxes Paid (\$1,000) | \$ 1,531,500 | \$ 437,743 | 40.02% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 827,587 | | |

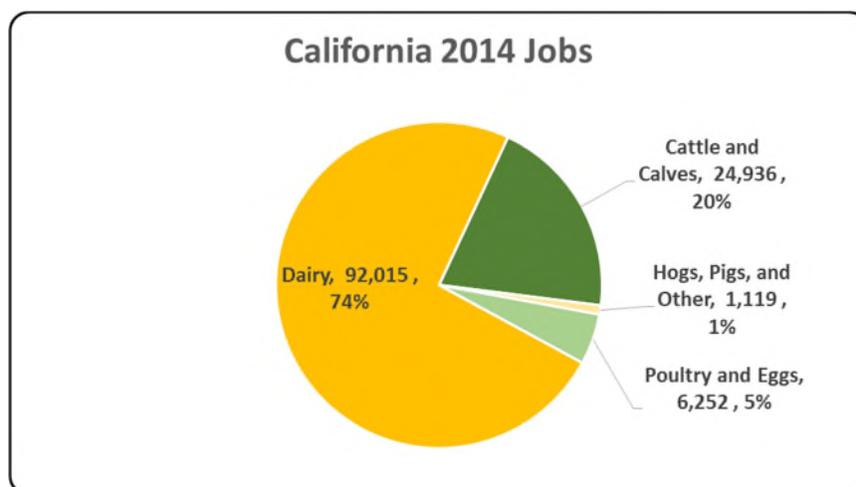
California Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the California economy. Animal agriculture’s impact on California total economic output is about \$27,311.3 million.



California Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to California in terms of animal agriculture jobs. As shown, animal agriculture contributes about 124,322 jobs within and outside of animal agriculture.



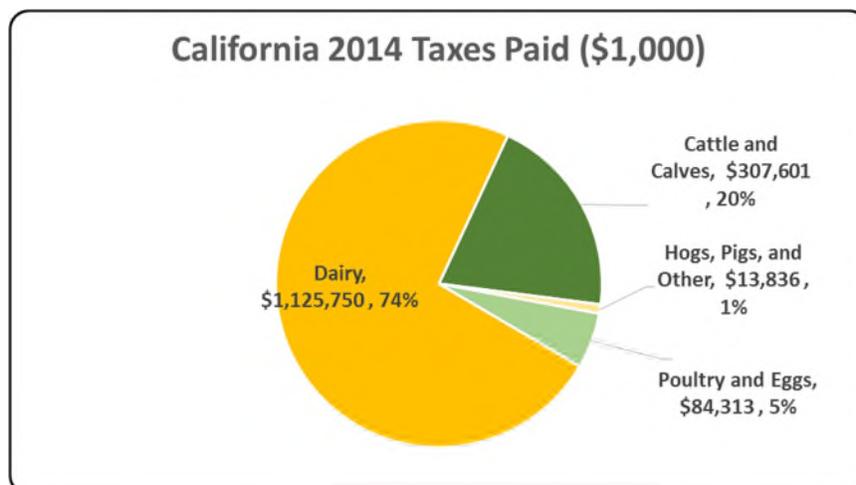
California Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the California economy in terms of earnings. California's animal agriculture contributed about \$5,168.7 million to household earnings in 2014.



California Taxes Paid by Animal Agriculture

California's animal agriculture is also a significant source of tax revenue. In 2014, the state's animal agriculture industry paid about \$1,531.5 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$827.6 million in property taxes paid by all of California agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



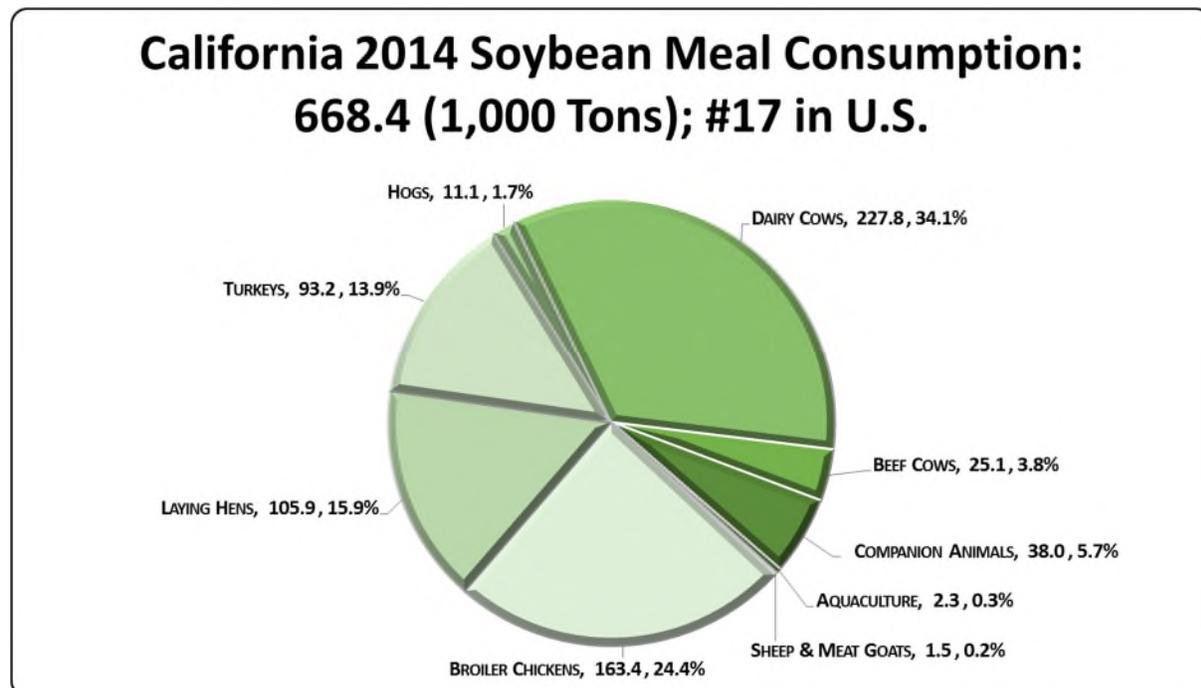
California Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

California's animal agriculture consumed almost 668.4 thousand tons of soybean meal in 2014, placing the state as #17 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (227.8 thousand tons)
- Broilers (163.4 thousand tons)
- Egg-Laying Hens (105.9 thousand tons)

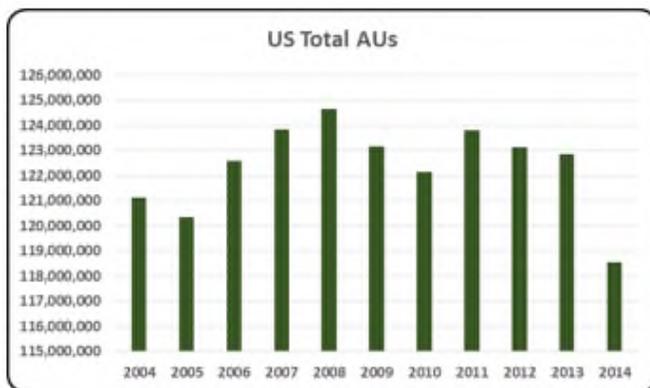


California Animal Unit (AU) Trends

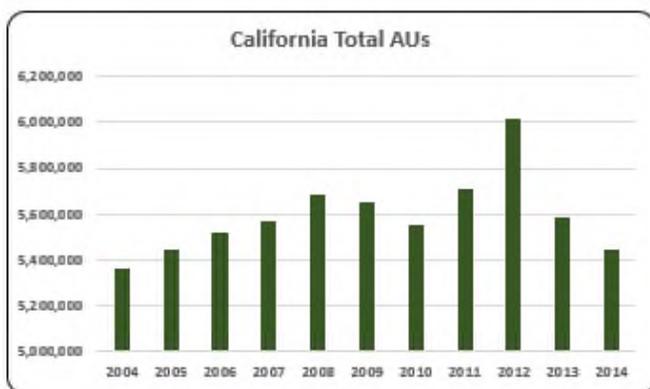
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of California. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to California and to give perspective on California’s contribution to the nation’s animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

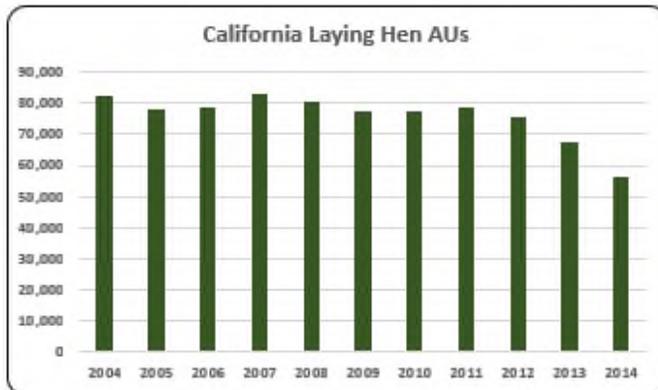
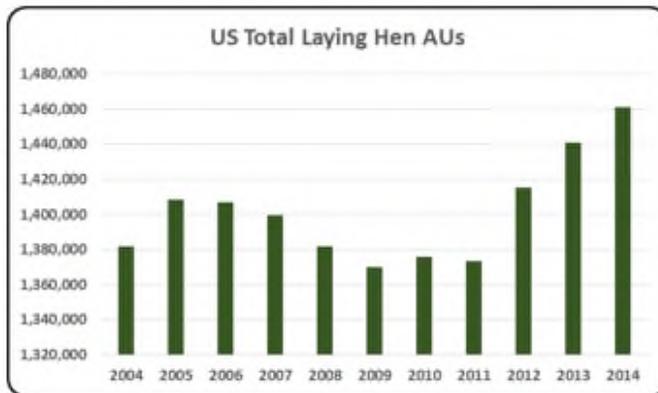
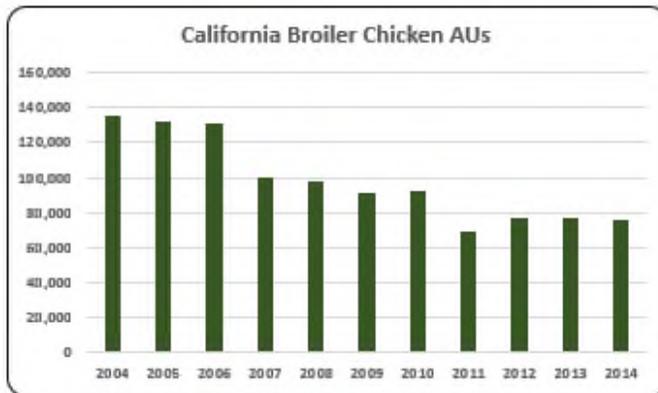
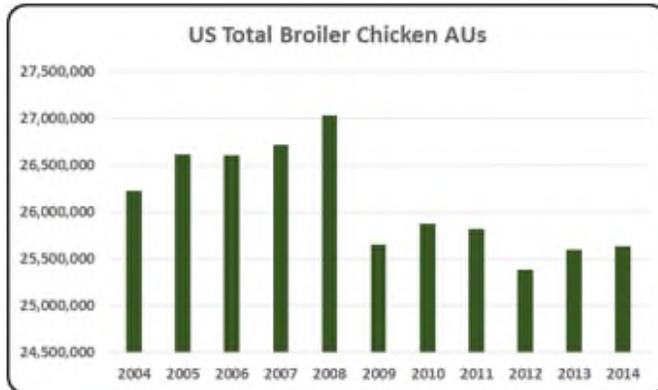
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In California, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (2,623.4 thousand AUs), Dairy Cows (2,492.0 thousand AUs), and Turkeys (164.9 thousand AUs). Total animal units in California during 2014 were 5,441.8 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- California’s total AUs in 2014 reached a level of 5,441.8 thousand representing 4.6% of all AUs in the U.S. during that year. From 2004 to 2014 AUs in California averaged 5,593.4 thousand.

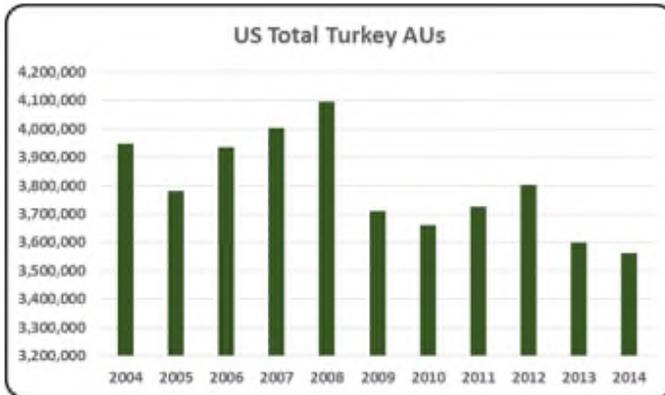


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AU numbers in 2012 (25.4 million AUs).

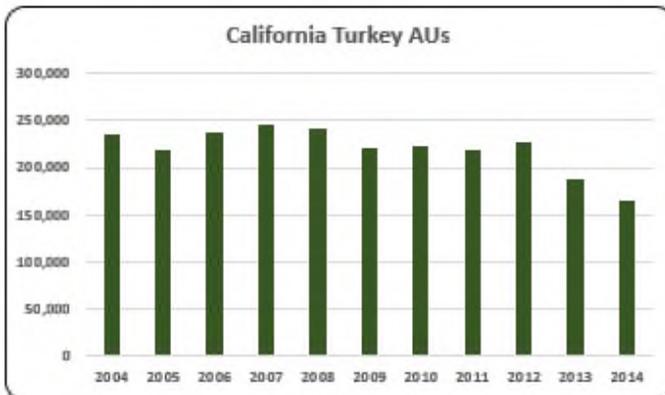
- Over the last decade there were, on average, 98,140 broiler AUs in California. Overall, broiler production in California declined since 2006, but broiler AUs over the last three years has been steady at about 76,477.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

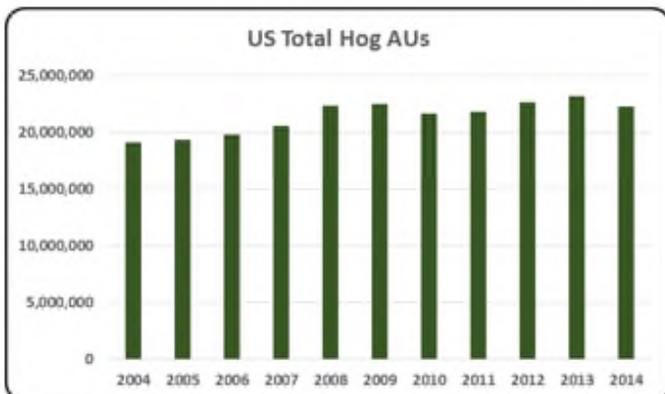
- In 2014, 1.0% of all AUs in California were in the layers production (76,098). Layer AUs have consistently decreased since the beginning of the decade, from 82,096 in 2004 to 56,286 in 2014, but the reduction has been more pronounced since 2012.



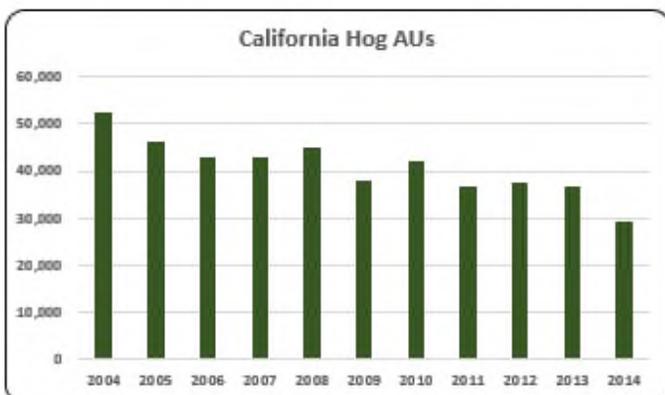
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.



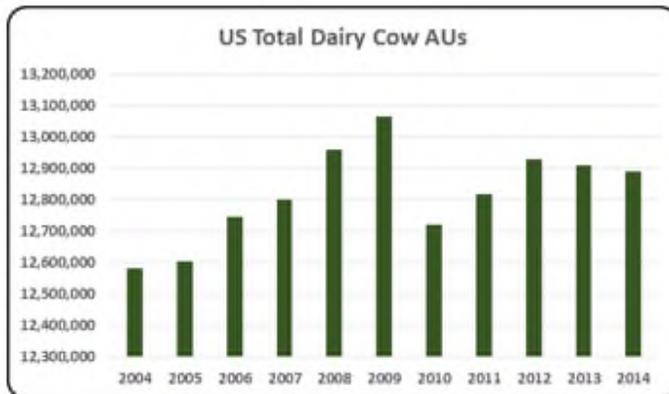
- There were 164,947 turkey AUs in California in 2014 which was 4.6% of all turkey AUs in the U.S. (3,562.5) during last year. Turkey AUs dropped 12.4% from the previous year (188,277).



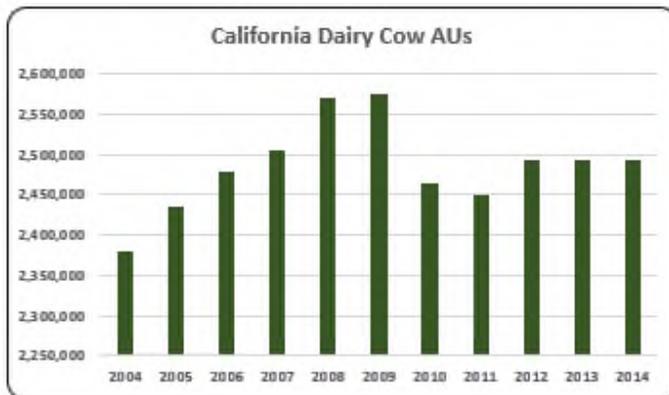
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.



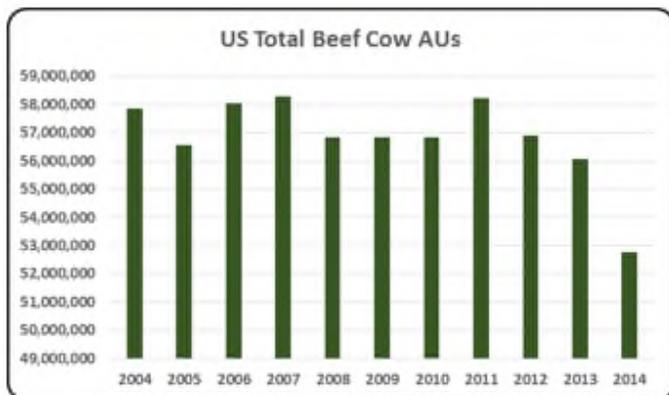
- California’s hog AUs dwindled 20.5% to 29,100 AUs, and these were the lowest of the decade. In contrast, 2004 hog AUs (52,500) were the highest of the period.



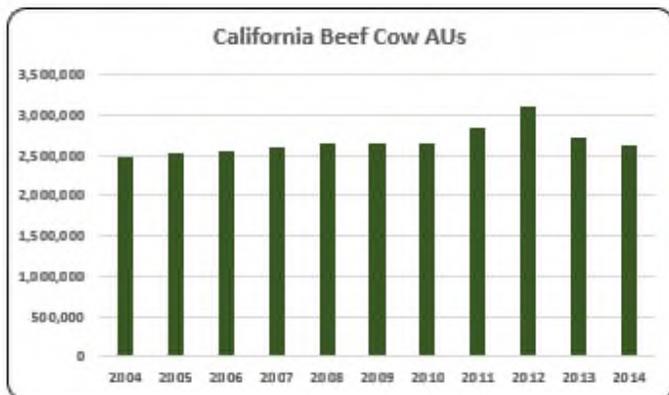
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- California had 19.3% (2,492 thousand) of all dairy cow AUs in the U.S. in 2014; however, California's dairy cow AUs in 2014 were the lowest of the decade since 2004 (2,380 thousand).



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- California's beef cow AUs in 2014 represented about 5% of all beef cow AUs in the U.S. in 2014. Beef cow AUs decreased 3.6% from the previous year and were the lowest since 2010 (2,650.5 thousand).

California Additional Information and Methodology

Animal agriculture is an important part of California's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in California, of interest is the degree to which the industry impacts the California economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for California animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted California's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in California which have occurred. As shown in this state report, California has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in California. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

California Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on California's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in California, \$1.790 to \$2.195 million in total economic activity, \$0.331 to \$0.406 in household wages and 8 to 10 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.1945 | \$ 0.3947 | 9.5 |
| | Hogs, Pigs, and Other | \$ 1.7903 | \$ 0.3312 | 7.9 |
| | Poultry and Eggs | \$ 2.1101 | \$ 0.3820 | 8.4 |
| | Dairy | \$ 2.1052 | \$ 0.4057 | 9.8 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| Animal Units (AUs) | Beef Cattle AUs | 2,475,600 | 2,535,750 | 2,551,950 | 2,592,750 | 2,650,500 | 2,650,500 | 2,650,500 | 2,852,250 | 3,103,050 | 2,722,650 | 2,623,350 |
| | Hog and Pig AUs | 52,500 | 46,350 | 42,750 | 42,750 | 45,000 | 37,950 | 42,000 | 36,900 | 37,350 | 36,600 | 29,100 |
| | Broiler AUs | 135,075 | 132,232 | 131,339 | 99,743 | 98,188 | 91,292 | 92,520 | 69,714 | 76,801 | 76,533 | 76,098 |
| | Turkey AUs | 235,500 | 218,648 | 238,306 | 244,607 | 241,554 | 219,798 | 222,355 | 219,102 | 226,420 | 188,277 | 164,947 |
| | Egg Layer AUs | 82,096 | 78,304 | 78,460 | 82,796 | 80,580 | 77,092 | 77,372 | 78,876 | 75,806 | 67,207 | 56,286 |
| | Dairy AUs | 2,380,000 | 2,436,000 | 2,478,000 | 2,506,000 | 2,569,000 | 2,576,000 | 2,464,000 | 2,450,000 | 2,492,000 | 2,492,000 | 2,492,000 |
| | Total Animal Units | 5,360,771 | 5,447,284 | 5,520,805 | 5,568,647 | 5,684,822 | 5,652,631 | 5,548,747 | 5,706,843 | 6,011,427 | 5,583,267 | 5,441,781 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 1,267,226 | \$ 1,210,259 | \$ 1,173,275 | \$ 1,289,346 | \$ 1,369,626 | \$ 1,097,174 | \$ 1,318,469 | \$ 2,005,694 | \$ 2,319,343 | \$ 2,275,348 | \$ 2,630,197 |
| | Hogs and Pigs (\$1,000) | \$ 38,615 | \$ 33,553 | \$ 31,409 | \$ 32,955 | \$ 26,177 | \$ 18,979 | \$ 23,925 | \$ 28,859 | \$ 24,991 | \$ 21,269 | \$ 22,747 |
| | Broilers (\$1,000) | \$ 113,610 | \$ 107,616 | \$ 83,164 | \$ 75,035 | \$ 77,224 | \$ 66,892 | \$ 70,406 | \$ 62,032 | \$ 76,507 | \$ 93,205 | \$ 97,775 |
| | Turkeys (\$1,000) | \$ 169,937 | \$ 170,216 | \$ 196,963 | \$ 211,669 | \$ 252,416 | \$ 202,800 | \$ 262,910 | \$ 287,463 | \$ 307,326 | \$ 242,925 | \$ 227,997 |
| | Eggs (\$1,000) | \$ 287,392 | \$ 181,655 | \$ 212,889 | \$ 346,426 | \$ 440,438 | \$ 319,805 | \$ 367,788 | \$ 387,522 | \$ 392,950 | \$ 382,690 | \$ 419,135 |
| | Milk (\$1,000) | \$ 5,371,295 | \$ 5,228,909 | \$ 4,496,514 | \$ 7,343,282 | \$ 6,930,345 | \$ 4,539,929 | \$ 5,932,557 | \$ 7,687,055 | \$ 6,905,525 | \$ 7,624,109 | \$ 9,364,944 |
| | Other | \$ 106,545 | \$ 110,067 | \$ 103,964 | \$ 100,841 | \$ 100,670 | \$ 106,821 | \$ 124,046 | \$ 113,667 | \$ 115,193 | \$ 116,719 | \$ 118,244 |
| | Sheep and Lambs (\$1,000) | \$ 38,685 | \$ 40,460 | \$ 32,610 | \$ 27,740 | \$ 25,822 | \$ 30,226 | \$ 45,704 | \$ 33,578 | \$ 33,357 | \$ 33,136 | \$ 32,914 |
| | Aquaculture (\$1,000) | \$ 67,860 | \$ 69,607 | \$ 71,354 | \$ 73,101 | \$ 74,848 | \$ 76,595 | \$ 78,342 | \$ 80,089 | \$ 81,836 | \$ 83,583 | \$ 85,330 |
| | Total (\$1,000) | \$ 7,354,620 | \$ 7,042,275 | \$ 6,298,178 | \$ 9,399,554 | \$ 9,196,896 | \$ 6,352,400 | \$ 8,100,101 | \$ 10,572,292 | \$ 10,141,835 | \$ 10,756,264 | \$ 12,881,039 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|-------------------|-------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 11,840 | 11,259 | 11,153 | 11,767 | |
| | Cattle feedlots (112112) | 528 | 553 | 404 | 156 | |
| | Dairy cattle and milk production (11212) | 2,122 | 2,361 | 1,839 | 1,594 | |
| | Hog and pig farming (1122) | 522 | 626 | 425 | 446 | |
| | Poultry and egg production (1123) | 1,046 | 914 | 1,798 | 1,202 | |
| | Sheep and goat farming (1124) | 1,533 | 2,485 | 3,041 | 3,246 | |
| | Animal aquaculture and other animal production (1125,1129) | 5,739 | 10,035 | 11,096 | 7,809 | |
| Value of Sales (\$1,000) | Cattle and Calves | 1,447,849 | 1,582,334 | 2,536,571 | 3,259,325 | |
| | Hogs and Pigs | 41,288 | 27,488 | 34,188 | 51,526 | |
| | Poultry and Eggs | 1,195,967 | 1,017,968 | 1,536,763 | 1,663,919 | |
| | Milk and Other Dairy Products | 3,184,363 | 3,739,213 | 6,569,172 | 6,945,102 | |
| | Aquaculture | 43,509 | 64,557 | 102,228 | 103,016 | |
| | Other (calculated) | 165,398 | 152,891 | 203,121 | 175,445 | |
| | Total | 6,078,374 | 6,584,451 | 10,982,043 | 12,198,333 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 10,957 | 10,745 | 10,881 | 12,585 | |
| | | \$1,000 | 759,223 | 949,697 | 1,264,818 | 1,254,286 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 6,070 | 5,951 | 6,850 | |
| | | \$1,000 | <i>n/a</i> | 114,594 | 186,901 | 255,730 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 6,404 | 6,356 | 7,673 | |
| | | \$1,000 | <i>n/a</i> | 835,104 | 1,077,917 | 998,556 |
| | Feed purchased | (Farms) 20,385 | 28,663 | 29,596 | 30,014 | |
| | \$1,000 | 2,588,982 | 2,494,806 | 4,274,263 | 6,069,374 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 5,771,967 | \$ 1,038,139 | 24,936 | \$ 307,601 |
| | Hogs, Pigs, and Other | \$ 252,416 | \$ 46,696 | 1,119 | \$ 13,836 |
| | Poultry and Eggs | \$ 1,571,827 | \$ 284,554 | 6,252 | \$ 84,313 |
| | Dairy | \$ 19,715,080 | \$ 3,799,358 | 92,015 | \$ 1,125,750 |
| | Total | \$ 27,311,291 | \$ 5,168,747 | 124,322 | \$ 1,531,500 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 2,286,813 | \$ 411,303 | 9,879 | \$ 121,869 |
| | Hogs, Pigs, and Other | \$ (73,274) | \$ (13,555) | (325) | \$ (4,016) |
| | Poultry and Eggs | \$ 62,008 | \$ 11,226 | 247 | \$ 3,326 |
| | Dairy | \$ 5,543,942 | \$ 1,068,391 | 25,875 | \$ 316,564 |
| | Total | \$ 7,819,489 | \$ 1,477,365 | 35,676 | \$ 437,743 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 2.1945 | \$ 0.3947 | 9.5 | |
| | Hogs, Pigs, and Other | \$ 1.7903 | \$ 0.3312 | 7.9 | |
| | Poultry and Eggs | \$ 2.1101 | \$ 0.3820 | 8.4 | |
| | Dairy | \$ 2.1052 | \$ 0.4057 | 9.8 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 9.3% |
| | Total | | | | 29.6% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: COLORADO

Colorado Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Colorado's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Colorado. The success of Colorado animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Colorado during 2014 animal agriculture contributed:

- \$10.4 billion in economic output
- 69,471 jobs
- \$1.9 billion in earnings
- \$473.3 million in income taxes paid at local, state, and federal levels
- \$96.2 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Colorado increased economic output by over \$1.6 billion, boosted household earnings by \$295.5 million, contributed 10,636 additional jobs and paid \$73.7 million in additional tax revenues.

Colorado's animal agriculture consumed about 219.8 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (128.3 thousand tons)
- Egg-Laying Hens (28.6 thousand tons)
- Beef Cows (22.8 thousand tons)

This report examines animal agriculture in Colorado over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Colorado, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Colorado and beyond.

Colorado Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Colorado's economy. In 2014, Colorado's animal agriculture contributed the following to the economy:

- About \$10.4 billion in economic output
- \$1.9 billion in household earnings
- 69,471 jobs
- \$473.3 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Colorado's animal agriculture has:

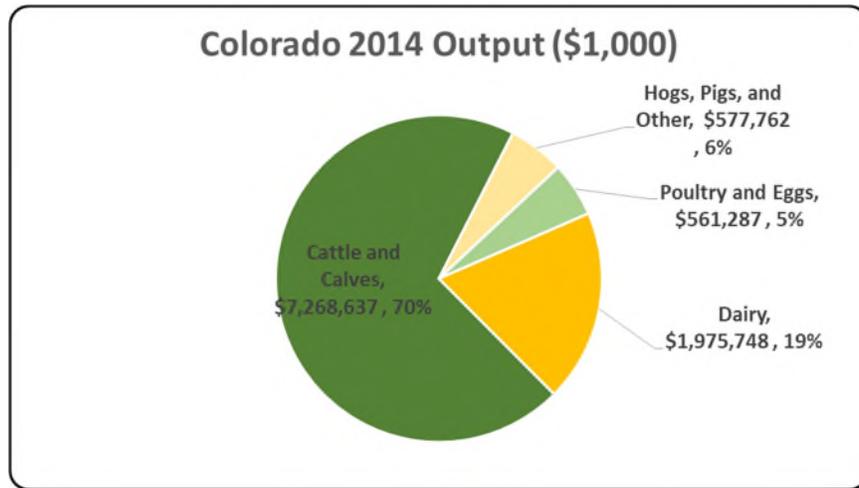
- Increased economic output by \$1.6 billion
- Boosted household earnings by \$295.5 million
- Added 10,636 jobs
- Paid an additional \$73.7 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 10,383,434 | \$ 1,572,022 | 17.84% |
| Earnings (\$1,000) | \$ 1,896,335 | \$ 295,457 | 18.46% |
| Employment (Jobs) | 69,471 | 10,636 | 18.08% |
| Income Taxes Paid (\$1,000) | \$ 473,325 | \$ 73,746 | 18.46% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 96,212 | | |

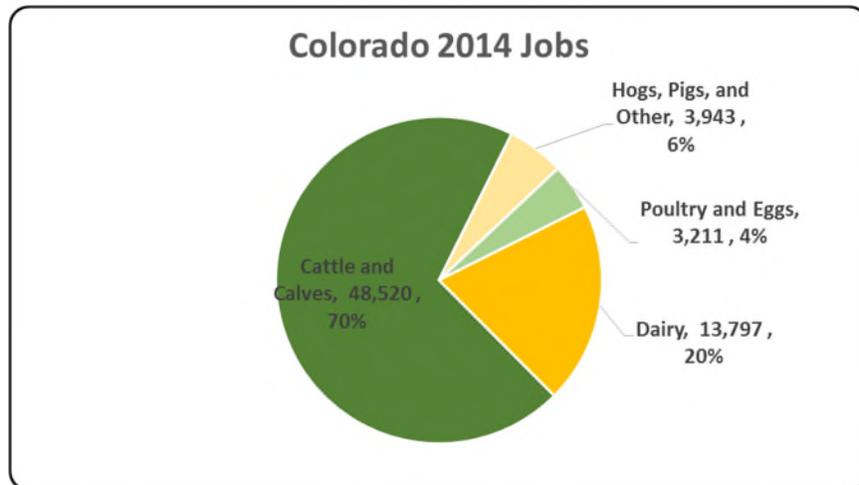
Colorado Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Colorado economy. Animal agriculture’s impact on Colorado total economic output is about \$10.4 billion.



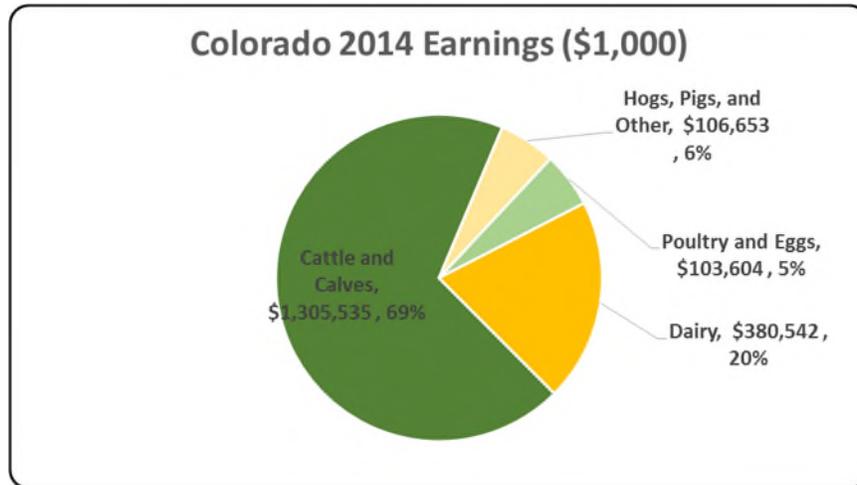
Colorado Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Colorado in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Colorado total jobs, contributing 69,471 jobs within and outside of animal agriculture.



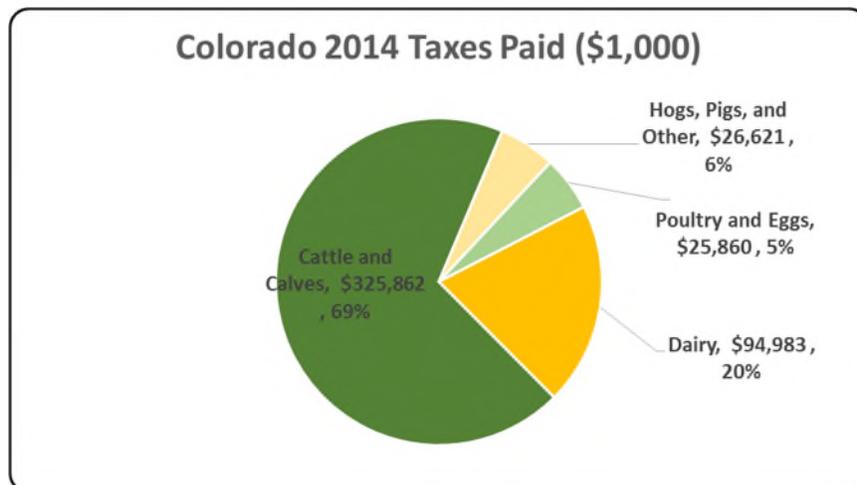
Colorado Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Colorado economy in terms of earnings. Colorado’s animal agriculture contributed about \$1.9 billion to household earnings in 2014.



Colorado Taxes Paid by Animal Agriculture

Colorado’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$473.3 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$96.2 million in property taxes paid by all of Colorado agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



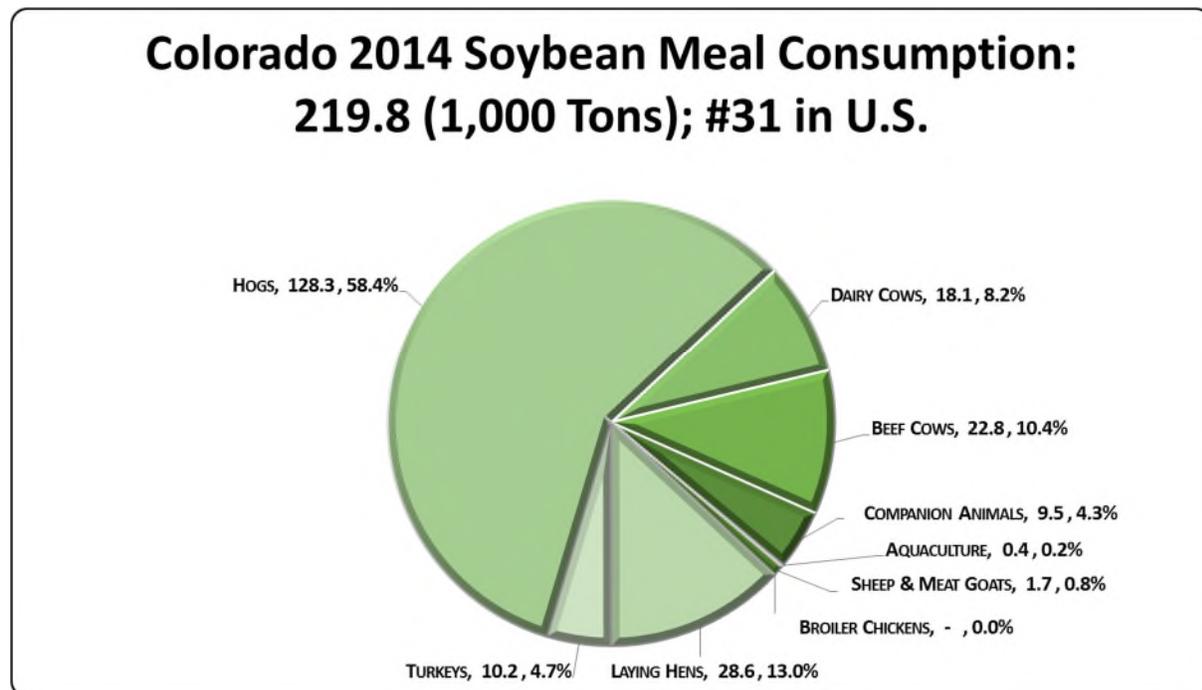
Colorado Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Colorado's animal agriculture consumed almost 219.8 thousand tons of soybean meal in 2014, placing the state as #31 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (128.3 thousand tons)
- Egg-Laying Hens (28.6 thousand tons)
- Beef Cows (22.8 thousand tons)

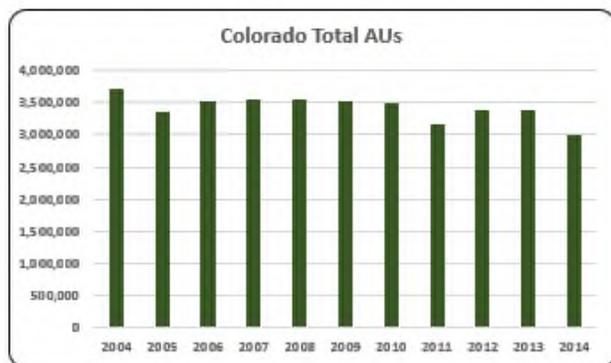
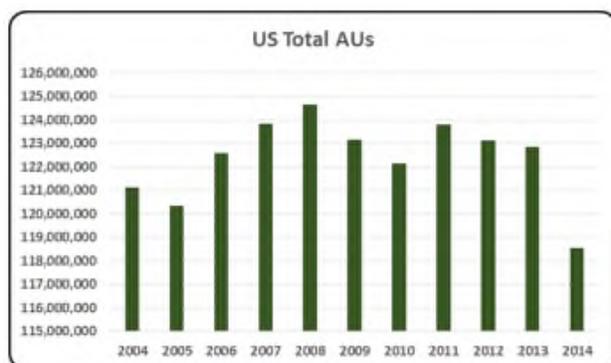


Colorado Animal Unit (AU) Trends

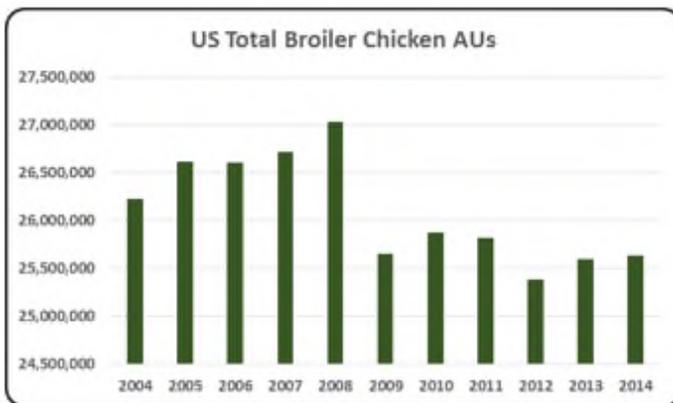
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Colorado. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Colorado and to give perspective on Colorado's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

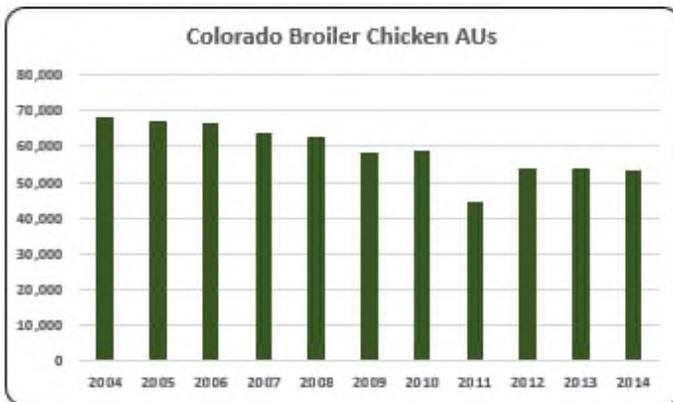
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Colorado, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (2,291.6 thousand AUs), Hogs (421.7 thousand AUs), and Dairy Cows (196.0 thousand AUs). Total animal units in Colorado during 2014 were 2,999.5 thousand AUs.



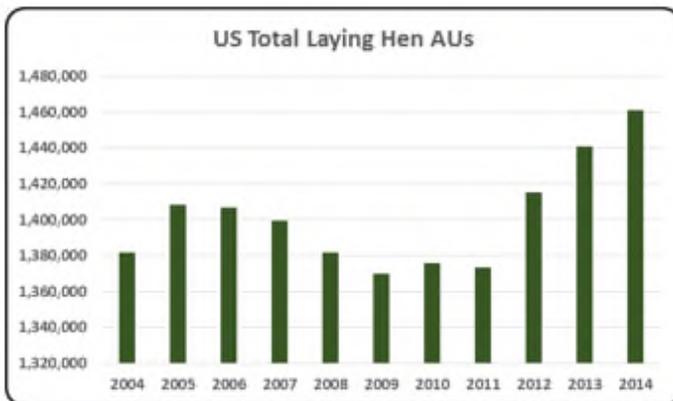
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- The average number of AUs in Colorado from 2004 to 2014 was 3,423.6 thousand. In 2014, AUs declined 11.3% to 2,999.5.



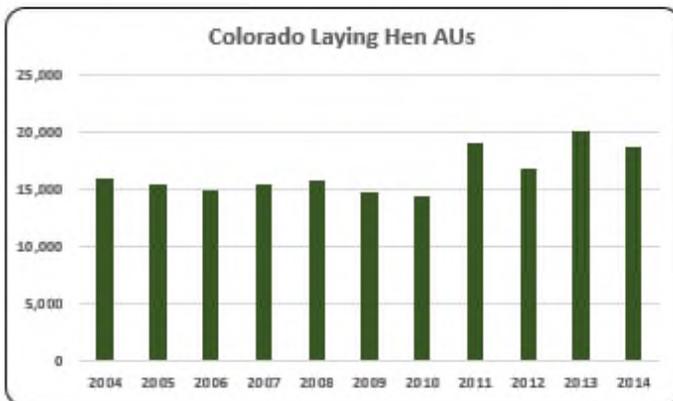
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



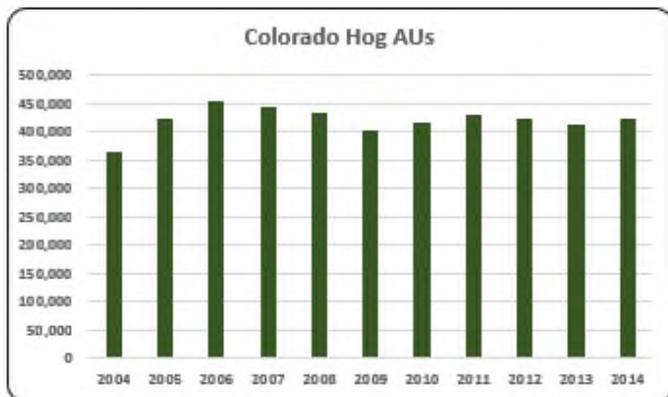
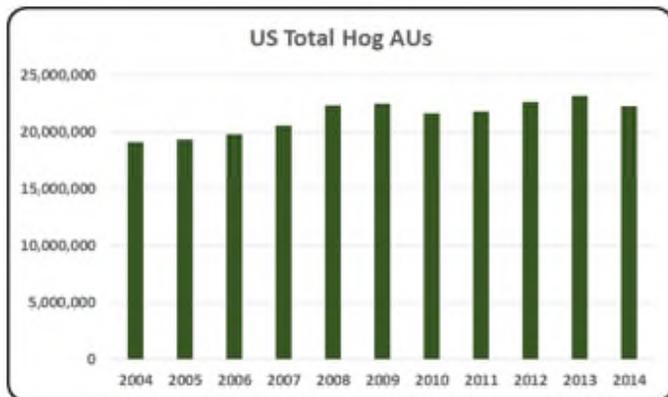
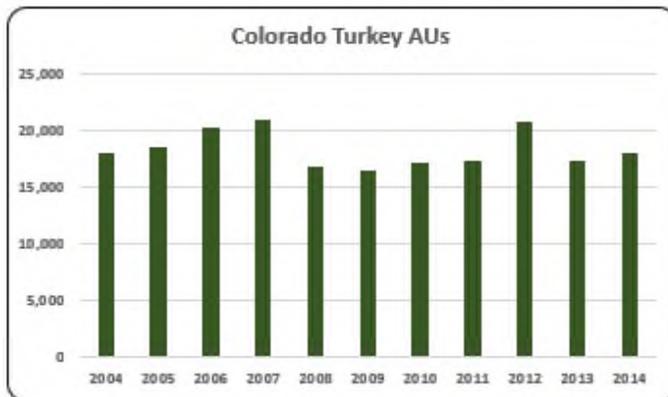
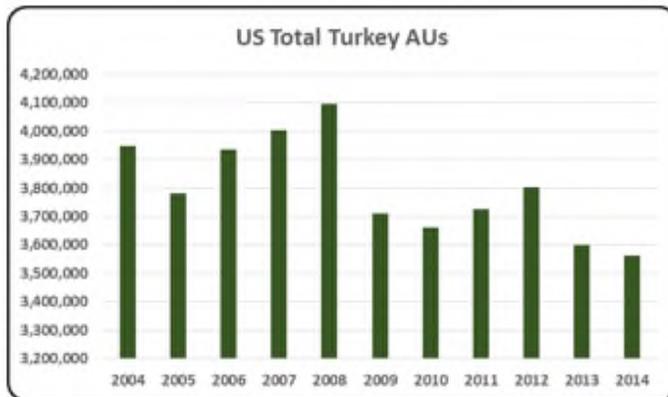
- At the state level, broiler AUs in 2014 represented about 1.8% (53,504) of all AUs in the state of Colorado. In general, broiler AUs have waned since 2004 (68,337), but have recovered from the low levels of 2011 (44,447).



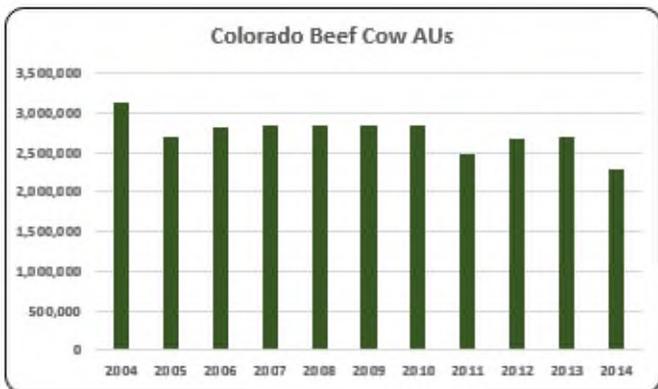
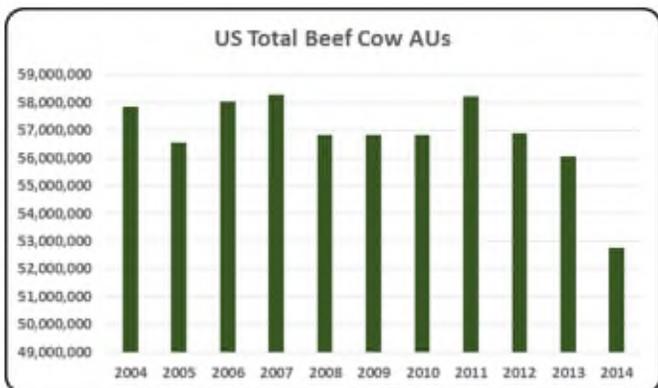
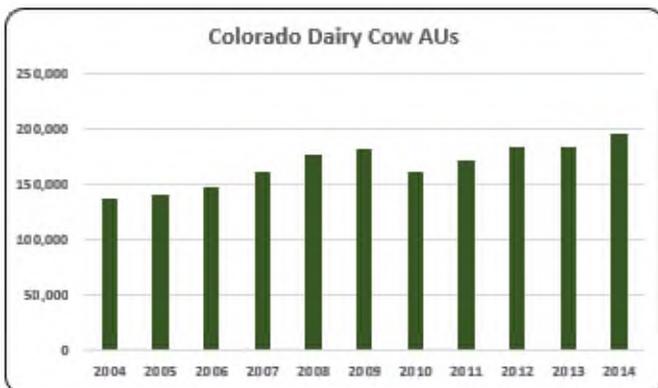
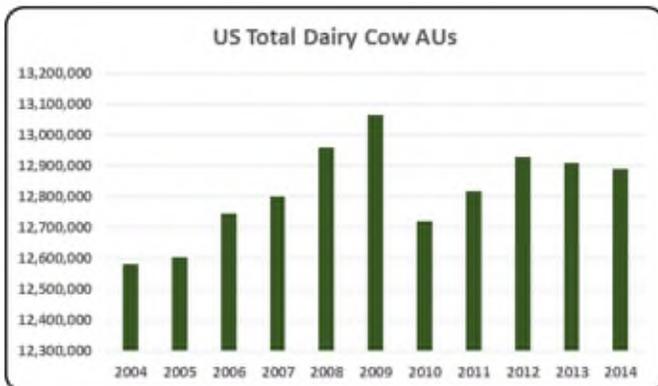
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



- Colorado layer AUs in 2014 (18,681) were 1.28% of all layer AUs in the U.S. Layer AUs in 2014 dropped 6.8% relative to the numbers in 2013, but increased 29% compared to 2010 (14,512).



- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- The average number of turkey AUs in Colorado from 2004 to 2014 was 18,365. Turkey AUs in Colorado increased 4.4% from 2013 to 2014.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- The number of hogs AUs (421,650) in 2014 represent 1.89% of all hog AUs in the country in that year. From 2004 to 2014, there have been 420,102 hog AUs, on average.



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.
- The third animal production in Colorado is dairy cow production with 196,000 AUs in 2014. On average, there have been 167,618 dairy cow AUs in Colorado from 2004 to 2014.
- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.
- About 76.4% (2,291.6 thousand) of all AUs in Colorado were beef cow AUs; however, that number declined 14.9% year-over-year and was the lowest of the decade.

Colorado Additional Information and Methodology

Animal agriculture is an important part of Colorado's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Colorado, of interest is the degree to which the industry impacts the Colorado economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Colorado animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Colorado's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Colorado which have occurred. As shown in this state report, Colorado has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Colorado. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Colorado Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Colorado’s economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of “per million dollars” of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Colorado, \$2.002 to \$3.017 million in total economic activity, \$0.370 to \$0.542 in household wages and 14 to 20 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 3.0165 | \$ 0.5418 | 20.1 |
| | Hogs, Pigs, and Other | \$ 2.0022 | \$ 0.3696 | 13.7 |
| | Poultry and Eggs | \$ 2.4130 | \$ 0.4454 | 13.8 |
| | Dairy | \$ 2.2912 | \$ 0.4413 | 16.0 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 3,118,350 | 2,700,600 | 2,826,600 | 2,850,600 | 2,838,600 | 2,838,600 | 2,838,600 | 2,482,875 | 2,681,250 | 2,692,500 | 2,291,550 |
| | Hog and Pig AUs | 365,550 | 422,100 | 453,000 | 445,050 | 432,450 | 400,950 | 414,450 | 430,125 | 422,700 | 413,100 | 421,650 |
| | Broiler AUs | 68,337 | 66,898 | 66,447 | 63,592 | 62,600 | 58,203 | 58,986 | 44,447 | 53,998 | 53,809 | 53,504 |
| | Turkey AUs | 18,136 | 18,600 | 20,211 | 20,993 | 16,780 | 16,437 | 17,121 | 17,426 | 20,813 | 17,361 | 18,132 |
| | Egg Layer AUs | 15,944 | 15,556 | 14,884 | 15,452 | 15,820 | 14,804 | 14,512 | 19,112 | 16,788 | 20,045 | 18,681 |
| | Dairy AUs | 137,200 | 141,400 | 147,000 | 161,000 | 176,400 | 182,000 | 162,400 | 172,200 | 183,400 | 184,800 | 196,000 |
| | Total Animal Units | 3,723,517 | 3,365,154 | 3,528,141 | 3,556,687 | 3,542,650 | 3,510,994 | 3,506,069 | 3,166,185 | 3,378,948 | 3,381,616 | 2,999,516 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 1,786,361 | \$ 1,813,022 | \$ 1,914,142 | \$ 1,914,783 | \$ 1,734,151 | \$ 1,597,426 | \$ 1,766,700 | \$ 1,927,383 | \$ 2,140,163 | \$ 2,162,134 | \$ 2,409,626 |
| | Hogs and Pigs (\$1,000) | \$ 200,030 | \$ 178,177 | \$ 175,440 | \$ 196,673 | \$ 159,404 | \$ 126,971 | \$ 189,680 | \$ 227,019 | \$ 206,066 | \$ 206,725 | \$ 235,645 |
| | Broilers (\$1,000) | \$ 57,477 | \$ 54,445 | \$ 42,074 | \$ 47,839 | \$ 49,234 | \$ 42,647 | \$ 44,888 | \$ 39,549 | \$ 53,791 | \$ 65,531 | \$ 68,744 |
| | Turkeys (\$1,000) | \$ 16,827 | \$ 17,843 | \$ 21,088 | \$ 24,211 | \$ 22,664 | \$ 15,200 | \$ 20,363 | \$ 22,839 | \$ 30,185 | \$ 19,878 | \$ 33,282 |
| | Eggs (\$1,000) | \$ 60,103 | \$ 42,141 | \$ 47,452 | \$ 74,074 | \$ 96,842 | \$ 70,308 | \$ 77,131 | \$ 85,801 | \$ 96,215 | \$ 103,782 | \$ 130,584 |
| | Milk (\$1,000) | \$ 347,256 | \$ 349,852 | \$ 331,110 | \$ 522,258 | \$ 540,040 | \$ 363,136 | \$ 461,824 | \$ 599,800 | \$ 597,618 | \$ 672,256 | \$ 862,320 |
| | Other | \$ 60,893 | \$ 73,414 | \$ 61,105 | \$ 55,713 | \$ 59,049 | \$ 58,733 | \$ 60,191 | \$ 56,511 | \$ 55,313 | \$ 54,116 | \$ 52,919 |
| | Sheep and Lambs (\$1,000) | \$ 57,738 | \$ 70,065 | \$ 57,562 | \$ 51,976 | \$ 55,118 | \$ 54,608 | \$ 55,872 | \$ 51,998 | \$ 50,606 | \$ 49,215 | \$ 47,824 |
| | Aquaculture (\$1,000) | \$ 3,155 | \$ 3,349 | \$ 3,543 | \$ 3,737 | \$ 3,931 | \$ 4,125 | \$ 4,319 | \$ 4,513 | \$ 4,707 | \$ 4,901 | \$ 5,095 |
| | Total (\$1,000) | \$ 2,528,947 | \$ 2,528,894 | \$ 2,592,411 | \$ 2,835,551 | \$ 2,661,385 | \$ 2,274,421 | \$ 2,620,777 | \$ 2,958,901 | \$ 3,179,351 | \$ 3,284,422 | \$ 3,793,119 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 10,883 | 9,819 | 9,598 | 10,528 | |
| | Cattle feedlots (112112) | 786 | 1,081 | 615 | 268 | |
| | Dairy cattle and milk production (11212) | 301 | 232 | 267 | 183 | |
| | Hog and pig farming (1122) | 398 | 445 | 453 | 343 | |
| | Poultry and egg production (1123) | 150 | 237 | 742 | 611 | |
| | Sheep and goat farming (1124) | 741 | 902 | 1,010 | 1,212 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,862 | 6,111 | 7,941 | 7,153 | |
| Value of Sales (\$1,000) | Cattle and Calves | 2,530,329 | 2,632,740 | 3,156,348 | 4,321,308 | |
| | Hogs and Pigs | 171,972 | 179,415 | 159,808 | 208,763 | |
| | Poultry and Eggs | 142,256 | 113,256 | 161,320 | 102,175 | |
| | Milk and Other Dairy Products | 188,783 | 247,035 | 456,076 | 559,422 | |
| | Aquaculture | 4,337 | 28,805 | 11,258 | 14,475 | |
| | Other (calculated) | 165,238 | 107,667 | 134,925 | 108,550 | |
| | Total | 3,202,915 | 3,308,918 | 4,079,735 | 5,314,693 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 9,954 | 8,174 | 8,517 | 9,728 | |
| | | \$1,000 | 1,271,336 | 1,662,797 | 1,778,706 | 1,885,482 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 4,686 | 4,866 | 5,372 | |
| | | \$1,000 | <i>n/a</i> | 46,389 | 86,507 | 98,374 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 4,650 | 4,944 | 5,838 | |
| | | \$1,000 | <i>n/a</i> | 1,616,409 | 1,692,199 | 1,787,108 |
| Feed purchased | (Farms) | 15,919 | 18,525 | 18,817 | 21,744 | |
| | \$1,000 | 861,580 | 866,170 | 1,221,367 | 1,972,993 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 7,268,637 | \$ 1,305,535 | 48,520 | \$ 325,862 |
| | Hogs, Pigs, and Other | \$ 577,762 | \$ 106,653 | 3,943 | \$ 26,621 |
| | Poultry and Eggs | \$ 561,287 | \$ 103,604 | 3,211 | \$ 25,860 |
| | Dairy | \$ 1,975,748 | \$ 380,542 | 13,797 | \$ 94,983 |
| | Total | \$ 10,383,434 | \$ 1,896,335 | 69,471 | \$ 473,325 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 515,510 | \$ 92,592 | 3,441 | \$ 23,111 |
| | Hogs, Pigs, and Other | \$ (76,953) | \$ (14,205) | (525) | \$ (3,546) |
| | Poultry and Eggs | \$ 154,832 | \$ 28,579 | 886 | \$ 7,133 |
| | Dairy | \$ 978,633 | \$ 188,491 | 6,834 | \$ 47,047 |
| | Total | \$ 1,572,022 | \$ 295,457 | 10,636 | \$ 73,746 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 3.0165 | \$ 0.5418 | 20.1 | |
| | Hogs, Pigs, and Other | \$ 2.0022 | \$ 0.3696 | 13.7 | |
| | Poultry and Eggs | \$ 2.4130 | \$ 0.4454 | 13.8 | |
| | Dairy | \$ 2.2912 | \$ 0.4413 | 16.0 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 4.6% | |
| | Total | | | 25.0% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: CONNECTICUT

Connecticut Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Connecticut's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Connecticut. The success of Connecticut animal agriculture in turn has an impact on the rest of the state and regional economies. For example, in the state of Connecticut during 2014 animal agriculture contributed:

- \$385.5 million in economic output
- 2,474 jobs
- \$64.4 million in earnings
- \$16.6 million in income taxes paid at local, state, and federal levels
- \$29.5 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Connecticut increased economic output by over \$101.4 million, boosted household earnings by \$16.7 million, contributed 619 additional jobs and paid \$4.3 million in additional tax revenues.

Connecticut's animal agriculture consumed about 28.8 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Egg-Laying Hens (14.5 thousand tons)
- Turkeys (6.5 thousand tons)
- Companion Animals (4.0 thousand tons)

This report examines animal agriculture in Connecticut over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Connecticut, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of Connecticut and beyond.

Connecticut Economic Impact of Animal Agriculture

Animal agriculture is a small part of Connecticut's economy. In 2014, Connecticut's animal agriculture contributed the following to the economy:

- About \$385.5 million in economic output
- \$64.4 million in household earnings
- 2,474 jobs
- \$16.6 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Connecticut's animal agriculture has:

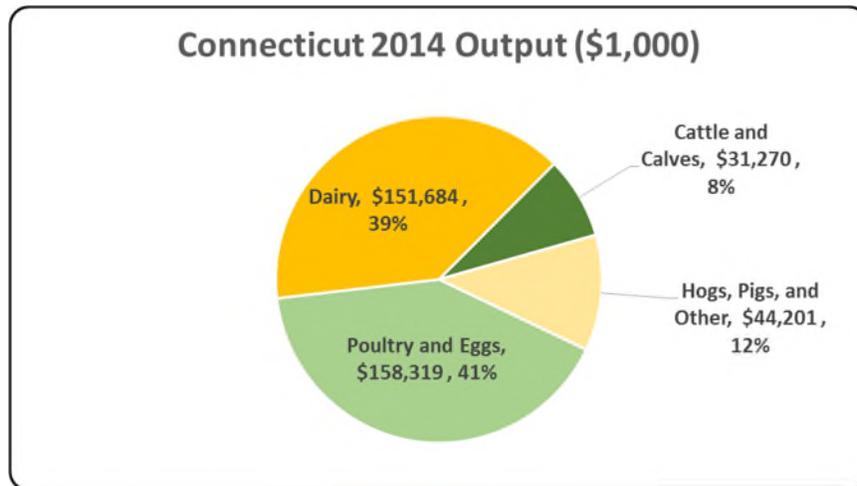
- Increased economic output by \$101.4 million
- Boosted household earnings by \$16.7 million
- Added 619 jobs
- Paid an additional \$4.3 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|------------|------------------|--------------------|
| Output (\$1,000) | \$ 385,474 | \$ 101,368 | 35.68% |
| Earnings (\$1,000) | \$ 64,431 | \$ 16,749 | 35.13% |
| Employment (Jobs) | 2,474 | 619 | 33.36% |
| Income Taxes Paid (\$1,000) | \$ 16,643 | \$ 4,326 | 35.13% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 29,547 | | |

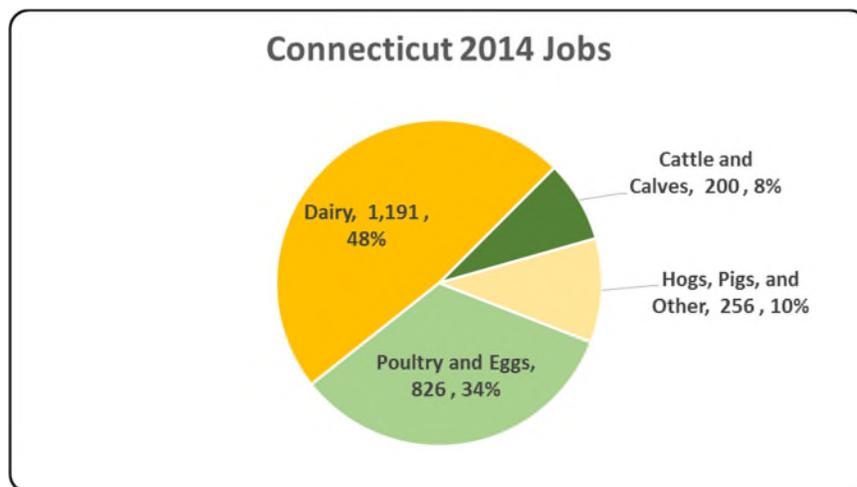
Connecticut Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Connecticut economy. Animal agriculture’s impact on Connecticut total economic output is about \$385.5 million.



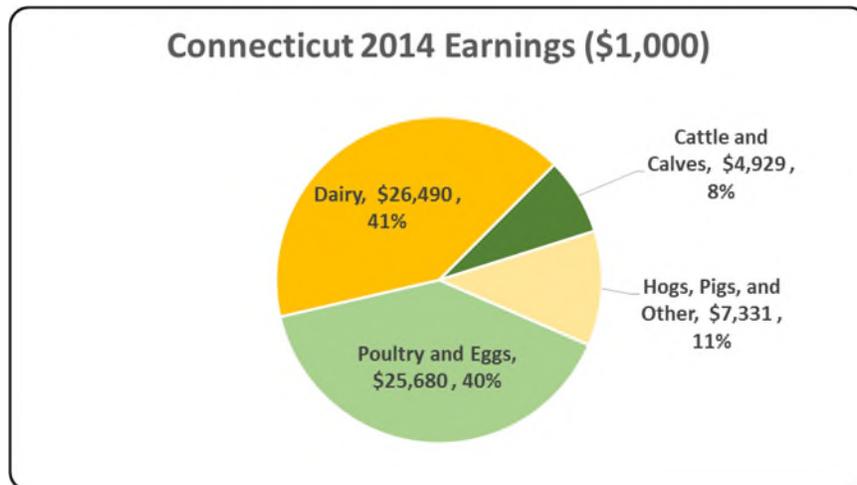
Connecticut Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Connecticut in terms of animal agriculture jobs. As shown, animal agriculture contributes about 2,474 jobs within and outside of animal agriculture.



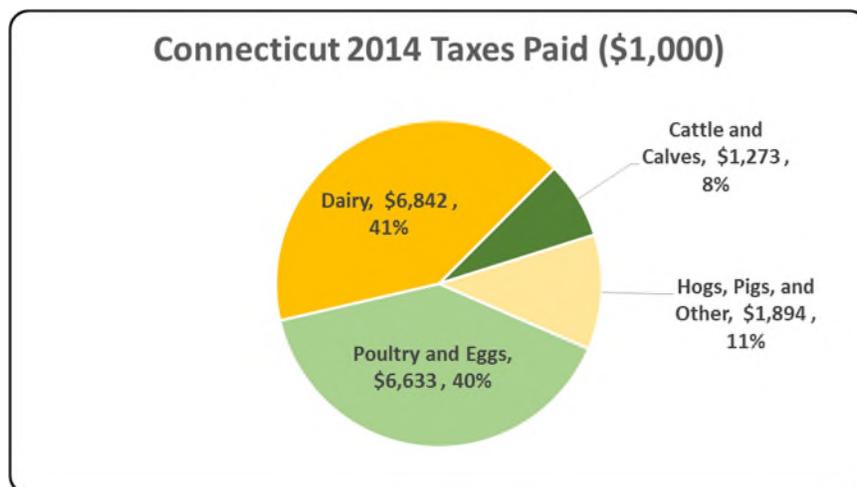
Connecticut Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Connecticut economy in terms of earnings. Connecticut’s animal agriculture contributed about \$64.4 million to household earnings in 2014.



Connecticut Taxes Paid by Animal Agriculture

Connecticut’s animal agriculture is also a source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$16.6 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$29.5 million in property taxes paid by all of Connecticut agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



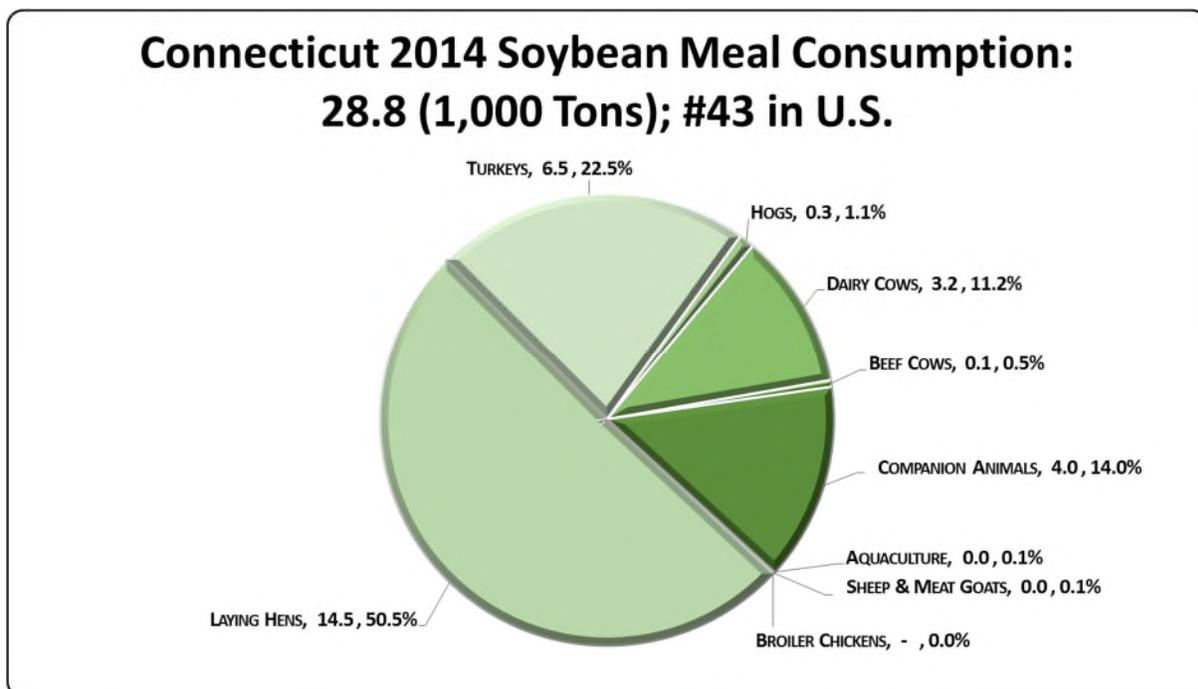
Connecticut Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Connecticut's animal agriculture consumed almost 28.8 thousand tons of soybean meal in 2014, placing the state as #43 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Egg-Laying Hens (14.5 thousand tons)
- Turkeys (6.5 thousand tons)
- Companion Animals (4.0 thousand tons)

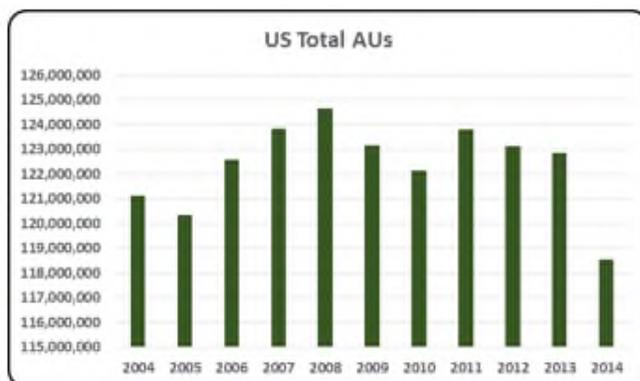


Connecticut Animal Unit (AU) Trends

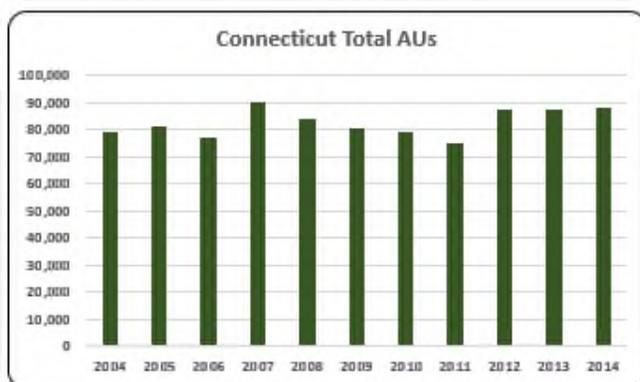
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Connecticut. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Connecticut and to give perspective on Connecticut's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

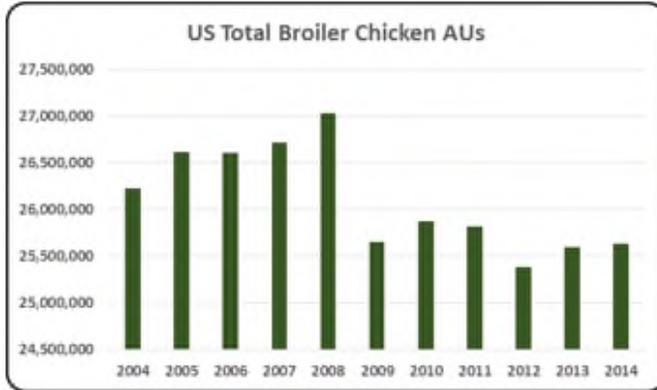
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Connecticut, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (34.9 thousand AUs), Dairy Cows (26.6 thousand AUs), and Beef Cows (16.1 thousand AUs). Total animal units in Connecticut during 2014 were 87.9 thousand AUs.



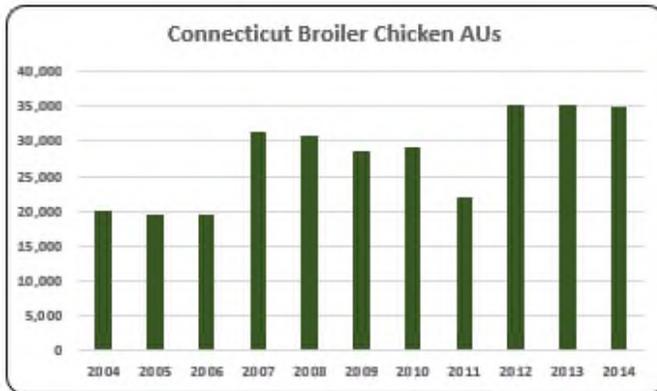
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



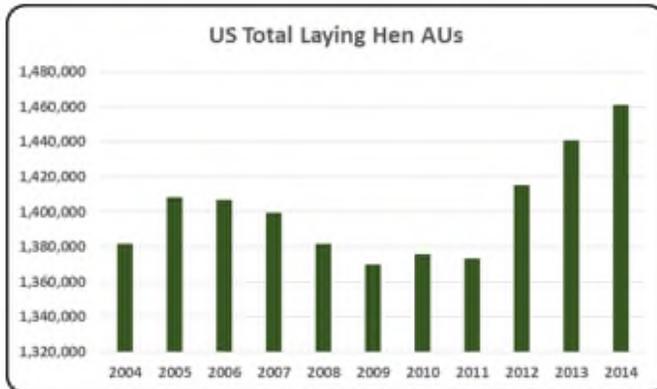
- There were 87,926 total AUs in Connecticut in 2014, representing 0.1% of all AUs in the U.S. On average, there were 82,552 AUs in the state from 2004 to 2014.



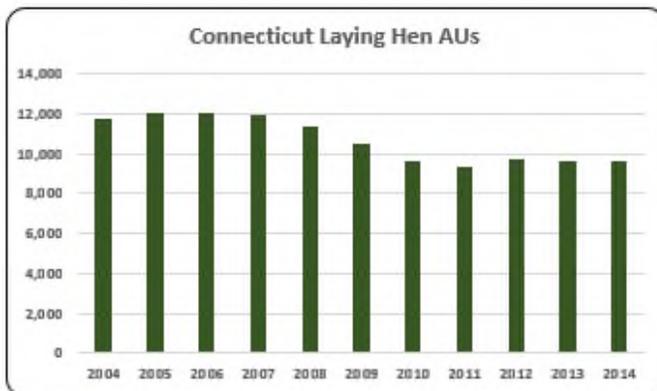
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AU numbers in 2012 (25.4 million AUs).



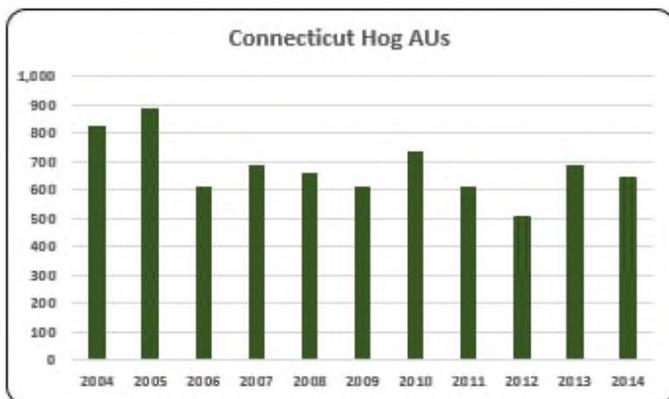
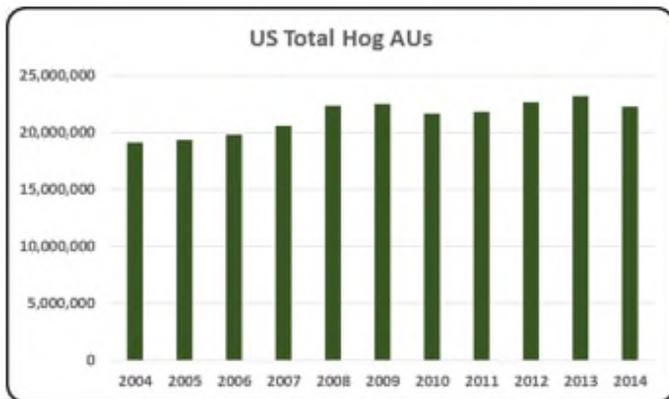
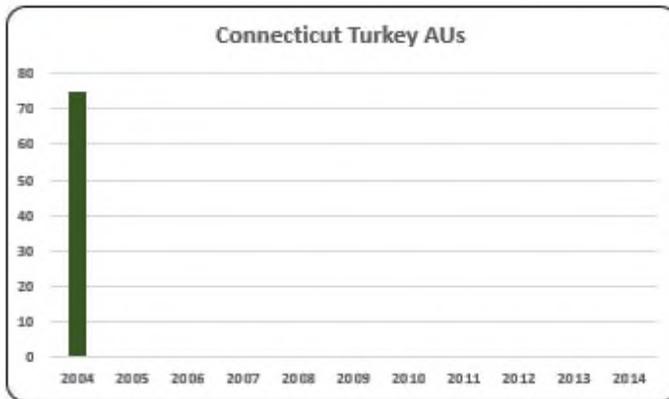
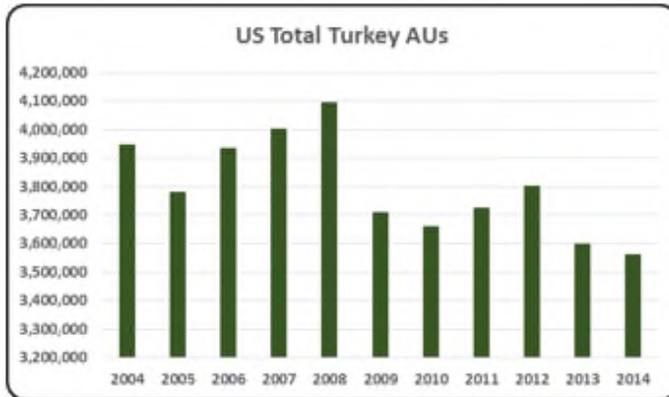
- The largest animal production in Connecticut is broilers with 34,886 broiler AUs in 2014. The number of broiler AUs in the state increased 59.2% from the low levels in 2011 (21,919).



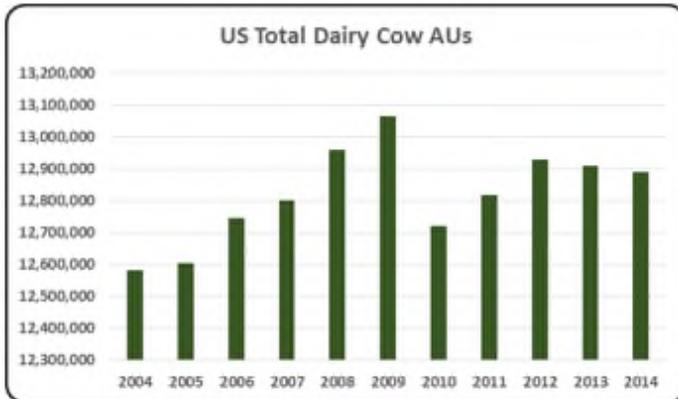
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



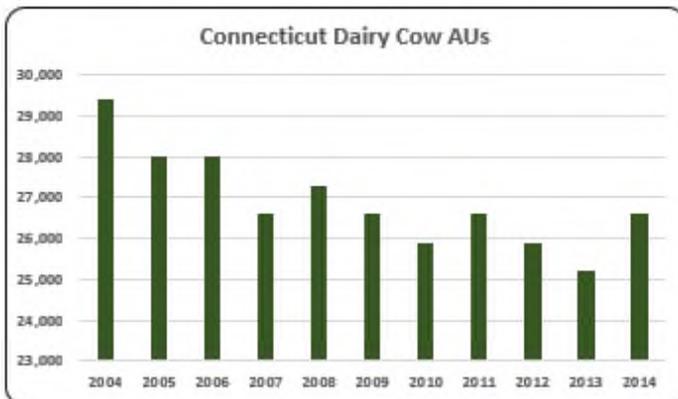
- On average (2004 to 2014) 13% of all AUs in the state were layer AUs and layer AUs have stayed below 10,000 AUs since 2009.



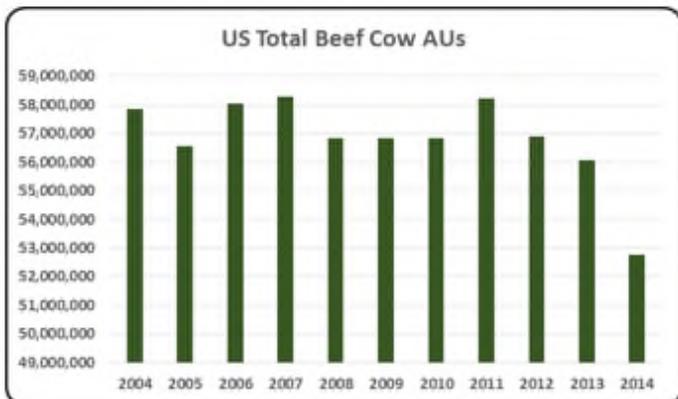
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production is practically non-existent in Connecticut.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog AUs represented only 0.76% (680) of all AUs in Connecticut in 2014.



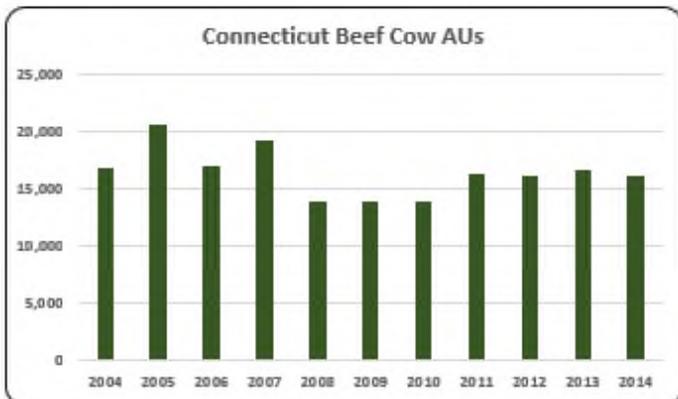
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- The average number of dairy cow AUs in Connecticut during last decade was 26,918 which represented 32.6% of the average number of all AUs in the state.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- On average there were 16,415 beef cow AUs from 2004 to 2014. Last year beef cow AUs fell 3.2% year-over-year, but the number stayed higher than 2008 to 2010 levels (13,890 beef cow AUs).

Connecticut Additional Information and Methodology

Animal agriculture is a small part of Connecticut's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Connecticut, of interest is the degree to which the industry impacts the Connecticut economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Connecticut animal agriculture are presented in this report.

Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Connecticut's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Connecticut which have occurred. As shown in this state report, Connecticut has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Connecticut. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Connecticut Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Connecticut's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Connecticut, \$1.408 to \$1.517 million in total economic activity, \$0.231 to \$0.265 in household wages and 8 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.4660 | \$ 0.2311 | 9.4 |
| | Hogs, Pigs, and Other | \$ 1.4084 | \$ 0.2336 | 8.1 |
| | Poultry and Eggs | \$ 1.4870 | \$ 0.2412 | 7.8 |
| | Dairy | \$ 1.5174 | \$ 0.2650 | 11.9 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Animal Units (AUs) | Beef Cattle AUs | 16,770 | 20,670 | 16,950 | 19,200 | 13,890 | 13,890 | 13,890 | 16,305 | 16,230 | 16,650 | 16,125 |
| | Hog and Pig AUs | 825 | 885 | 615 | 690 | 660 | 615 | 735 | 615 | 510 | 690 | 645 |
| | Broiler AUs | 19,982 | 19,561 | 19,429 | 31,360 | 30,871 | 28,703 | 29,089 | 21,919 | 35,208 | 35,085 | 34,886 |
| | Turkey AUs | 75 | - | - | - | - | - | - | - | - | - | - |
| | Egg Layer AUs | 11,792 | 12,064 | 12,060 | 11,932 | 11,340 | 10,528 | 9,620 | 9,368 | 9,699 | 9,675 | 9,670 |
| | Dairy AUs | 29,400 | 28,000 | 28,000 | 26,600 | 27,300 | 26,600 | 25,900 | 26,600 | 25,900 | 25,200 | 26,600 |
| | Total Animal Units | 78,844 | 81,180 | 77,054 | 89,782 | 84,061 | 80,336 | 79,234 | 74,807 | 87,547 | 87,300 | 87,926 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 9,484 | \$ 9,366 | \$ 10,439 | \$ 9,044 | \$ 8,858 | \$ 8,552 | \$ 8,626 | \$ 14,205 | \$ 14,451 | \$ 13,008 | \$ 21,330 |
| | Hogs and Pigs (\$1,000) | \$ 563 | \$ 430 | \$ 294 | \$ 346 | \$ 280 | \$ 324 | \$ 565 | \$ 450 | \$ 453 | \$ 864 | \$ 736 |
| | Broilers (\$1,000) | \$ 16,806 | \$ 15,920 | \$ 12,302 | \$ 23,592 | \$ 24,280 | \$ 21,032 | \$ 22,137 | \$ 19,504 | \$ 35,073 | \$ 42,728 | \$ 44,823 |
| | Turkeys (\$1,000) | \$ 171 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Eggs (\$1,000) | \$ 46,038 | \$ 33,458 | \$ 33,840 | \$ 51,938 | \$ 60,116 | \$ 41,686 | \$ 39,566 | \$ 41,948 | \$ 46,588 | \$ 52,024 | \$ 61,646 |
| | Milk (\$1,000) | \$ 67,816 | \$ 63,360 | \$ 52,848 | \$ 76,285 | \$ 73,528 | \$ 50,479 | \$ 65,520 | \$ 79,059 | \$ 70,526 | \$ 79,920 | \$ 99,963 |
| | Other | \$ 10,930 | \$ 12,902 | \$ 14,874 | \$ 16,846 | \$ 18,817 | \$ 20,789 | \$ 22,761 | \$ 24,733 | \$ 26,704 | \$ 28,676 | \$ 30,648 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 10,930 | \$ 12,902 | \$ 14,874 | \$ 16,846 | \$ 18,817 | \$ 20,789 | \$ 22,761 | \$ 24,733 | \$ 26,704 | \$ 28,676 | \$ 30,648 |
| | Total (\$1,000) | \$ 151,808 | \$ 135,436 | \$ 124,597 | \$ 178,050 | \$ 185,879 | \$ 142,862 | \$ 159,174 | \$ 179,898 | \$ 193,795 | \$ 217,220 | \$ 259,146 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|----------------|----------------|----------------|----------------|-------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 420 | 342 | 490 | 693 | |
| | Cattle feedlots (112112) | 63 | 90 | 32 | 6 | |
| | Dairy cattle and milk production (11212) | 266 | 231 | 212 | 146 | |
| | Hog and pig farming (1122) | 46 | 47 | 69 | 160 | |
| | Poultry and egg production (1123) | 89 | 128 | 273 | 175 | |
| | Sheep and goat farming (1124) | 100 | 120 | 198 | 246 | |
| | Animal aquaculture and other animal production (1125,1129) | 419 | 792 | 820 | 1,507 | |
| Value of Sales (\$1,000) | Cattle and Calves | 6,777 | 7,025 | 9,405 | 9,751 | |
| | Hogs and Pigs | 1,189 | - | 616 | 1,259 | |
| | Poultry and Eggs | 72,500 | 62,411 | 45,274 | 48,859 | |
| | Milk and Other Dairy Products | 67,118 | 56,523 | 72,338 | 69,843 | |
| | Aquaculture | n/a | 12,848 | 15,142 | 19,665 | |
| | Other (calculated) | 13,338 | 4,303 | 7,406 | 4,018 | |
| | Total | 160,922 | 143,110 | 150,181 | 153,395 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 837 | 948 | 1,077 | 1,487 | |
| | | \$1,000 | 8,740 | 8,644 | 7,164 | 6,536 |
| | Breeding livestock purchased | (Farms) n/a | 361 | 392 | 527 | |
| | | \$1,000 | n/a | 686 | 2,058 | 1,583 |
| | Other livestock and poultry purchased | (Farms) n/a | 701 | 846 | 1,190 | |
| | | \$1,000 | n/a | 7,957 | 5,106 | 4,953 |
| | Feed purchased | (Farms) 1,446 | 2,372 | 2,458 | 3,617 | |
| | \$1,000 | 58,691 | 42,832 | 55,295 | 66,754 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|-------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 31,270 | \$ 4,929 | 200 | \$ 1,273 |
| | Hogs, Pigs, and Other | \$ 44,201 | \$ 7,331 | 256 | \$ 1,894 |
| | Poultry and Eggs | \$ 158,319 | \$ 25,680 | 826 | \$ 6,633 |
| | Dairy | \$ 151,684 | \$ 26,490 | 1,191 | \$ 6,842 |
| | Total | \$ 385,474 | \$ 64,431 | 2,474 | \$ 16,643 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 13,845 | \$ 2,183 | 89 | \$ 564 |
| | Hogs, Pigs, and Other | \$ 23,915 | \$ 3,967 | 138 | \$ 1,025 |
| | Poultry and Eggs | \$ 40,887 | \$ 6,632 | 213 | \$ 1,713 |
| | Dairy | \$ 22,721 | \$ 3,968 | 178 | \$ 1,025 |
| | Total | \$ 101,368 | \$ 16,749 | 619 | \$ 4,326 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.4660 | \$ 0.2311 | 9.4 | |
| | Hogs, Pigs, and Other | \$ 1.4084 | \$ 0.2336 | 8.1 | |
| | Poultry and Eggs | \$ 1.4870 | \$ 0.2412 | 7.8 | |
| | Dairy | \$ 1.5174 | \$ 0.2650 | 11.9 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 5.5% |
| | Total | | | | 25.8% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: DELAWARE

Delaware Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Delaware's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture success in Delaware. The success of Delaware animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Delaware during 2014 animal agriculture contributed:

- \$2.3 billion in economic output
- 7,466 jobs
- \$325.5 million in earnings
- \$84.2 million in income taxes paid at local, state, and federal levels
- \$6.2 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Delaware increased economic output by over \$476.4 million, boosted household earnings by \$68.4 million, contributed 1,556 additional jobs and paid \$17.7 million in additional tax revenues.

Delaware's animal agriculture consumed about 292.7 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (276.9 thousand tons)
- Companion Animals (10.3 thousand tons)
- Horses (9.9 thousand tons)

This report examines animal agriculture in Delaware over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Delaware, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Delaware and beyond.

Delaware Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Delaware's economy. In 2014, Delaware's animal agriculture contributed the following to the economy:

- About \$2.3 billion in economic output
- \$325.5 million in household earnings
- 7,466 jobs
- \$84.2 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Delaware's animal agriculture has:

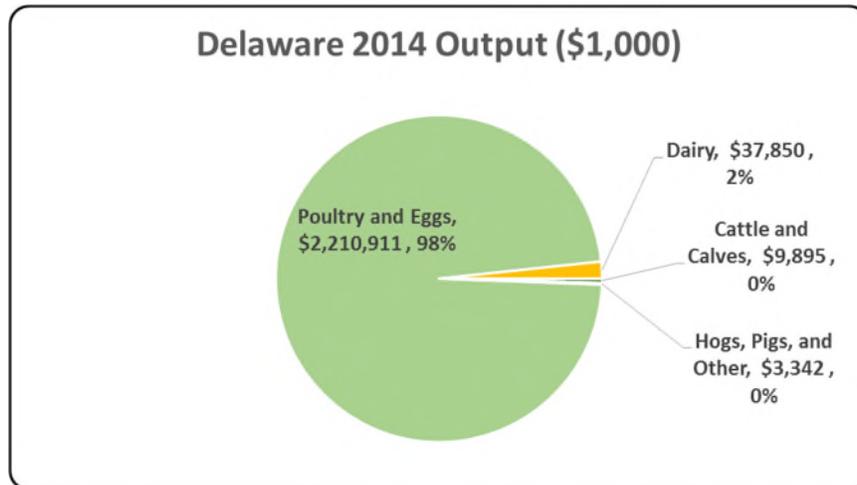
- Increased economic output by \$476.4 million
- Boosted household earnings by \$68.4 million
- Added 1,556 jobs
- Paid an additional \$17.7 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 2,261,998 | \$ 476,361 | 26.68% |
| Earnings (\$1,000) | \$ 325,481 | \$ 68,375 | 26.59% |
| Employment (Jobs) | 7,466 | 1,556 | 26.34% |
| Income Taxes Paid (\$1,000) | \$ 84,234 | \$ 17,695 | 26.59% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 6,223 | | |

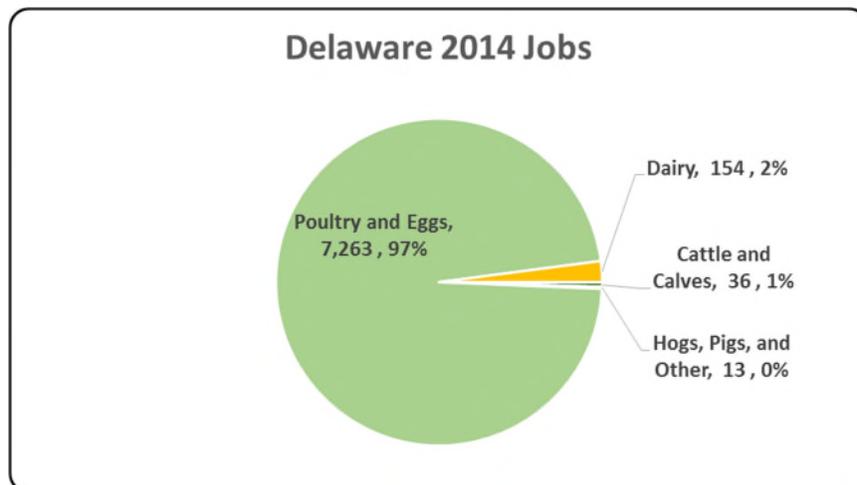
Delaware Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Delaware economy. Animal agriculture’s impact on Delaware total economic output is about \$2.3 billion.



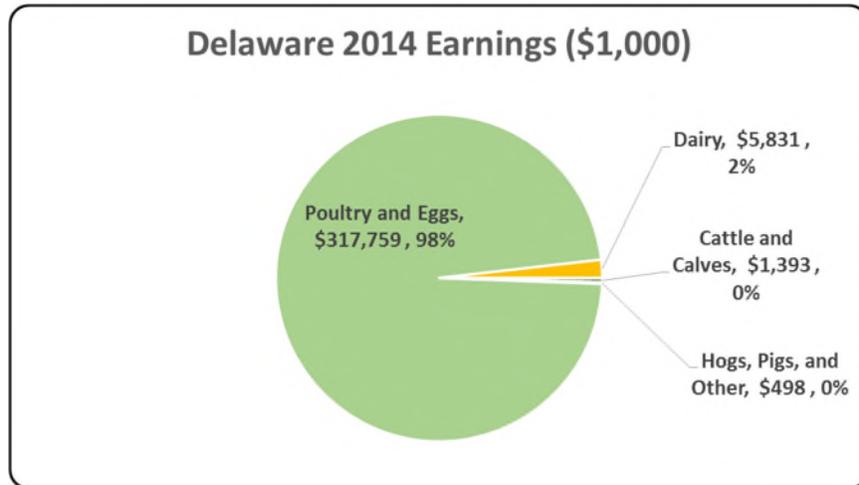
Delaware Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Delaware in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Delaware total jobs, contributing 7,466 jobs within and outside of animal agriculture.



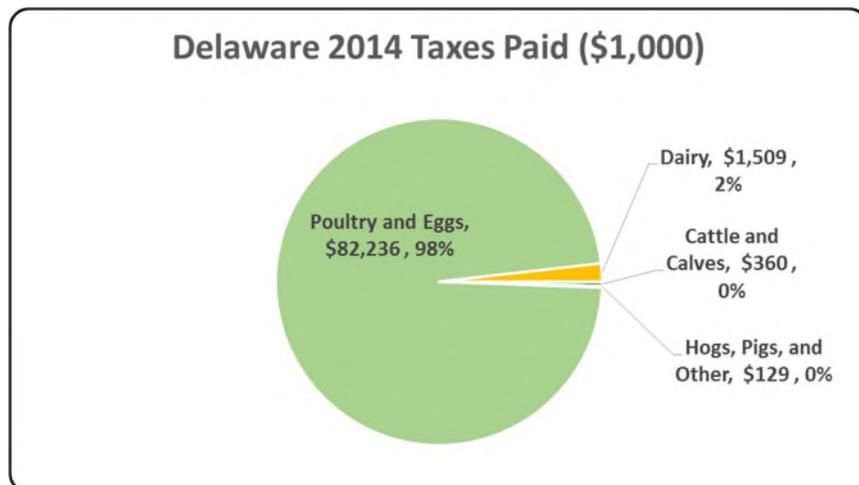
Delaware Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Delaware economy in terms of earnings. Delaware’s animal agriculture contributed about \$325.5 million to household earnings in 2014.



Delaware Taxes Paid by Animal Agriculture

Delaware’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$84.2 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$6.2 million in property taxes paid by all of Delaware agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



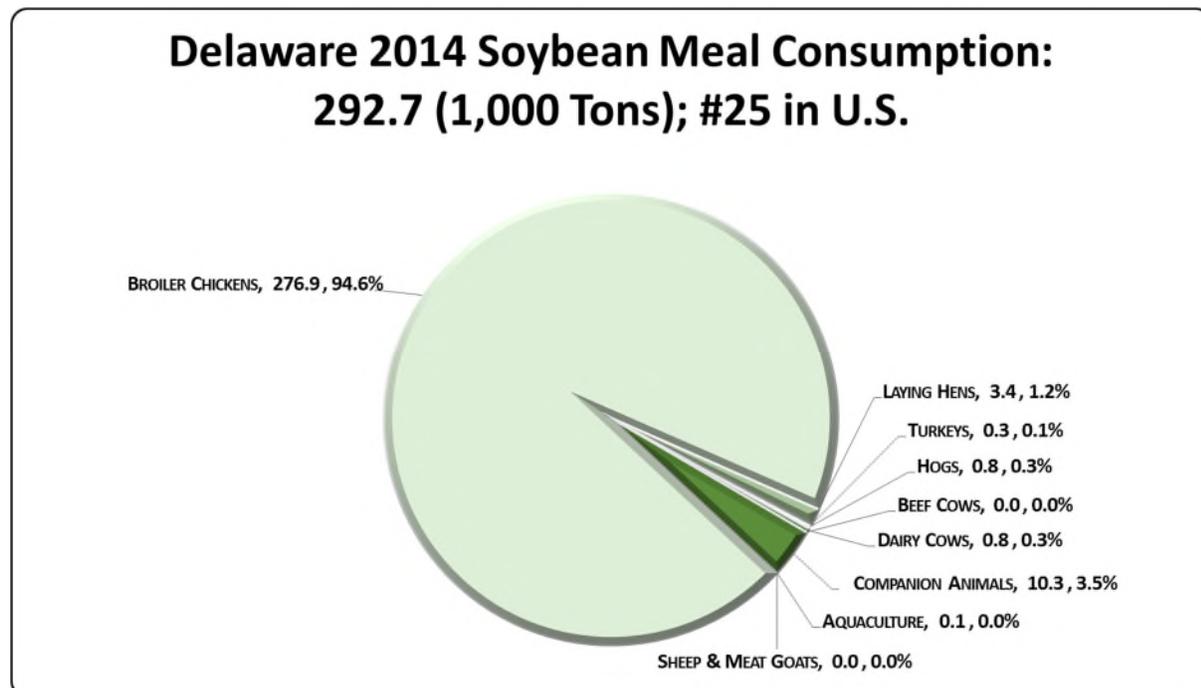
Delaware Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Delaware's animal agriculture consumed almost 292.7 thousand tons of soybean meal in 2014, placing the state as #25 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (276.9 thousand tons)
- Companion Animals (10.3 thousand tons)
- Horses (9.9 thousand tons)

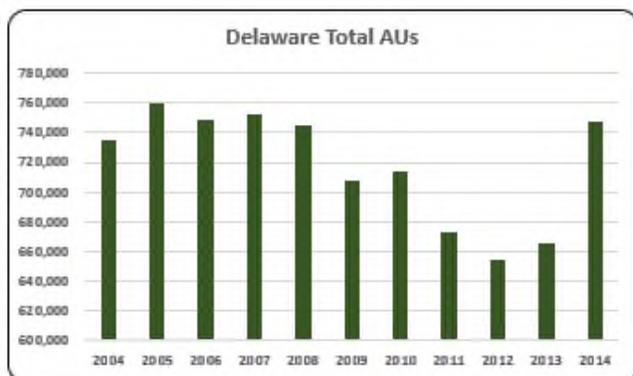
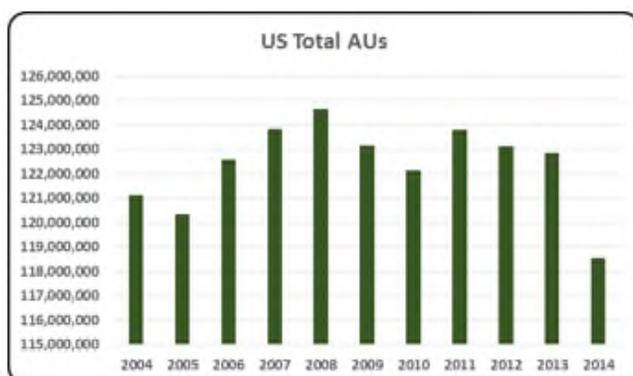


Delaware Animal Unit (AU) Trends

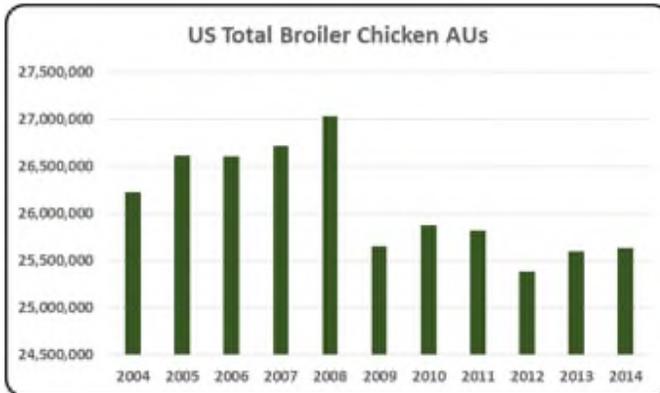
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Delaware. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Delaware and to give perspective on Delaware's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

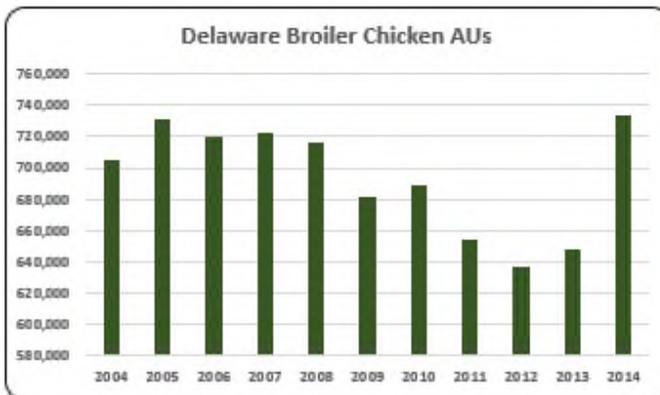
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Delaware, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (733.7 thousand AUs), Dairy Cows (6.6 thousand AUs), and Beef Cows (4.6 thousand AUs). Total animal units in Delaware during 2014 were 747.3 thousand AUs.



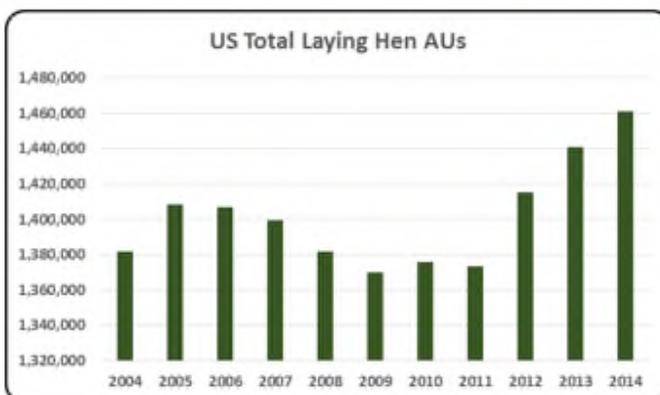
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- The total number of AUs in Delaware in 2014 was 747,320, a number that represented only 0.6% of all AUs in the U.S. 2014. The state housed 2.9% (733,651) of all broiler AUs in the U.S. in 2014.



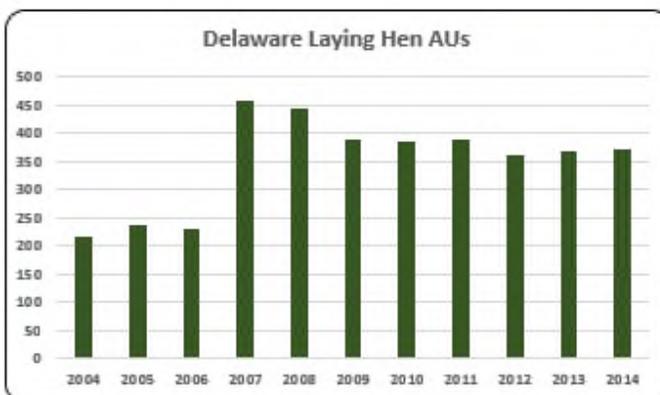
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



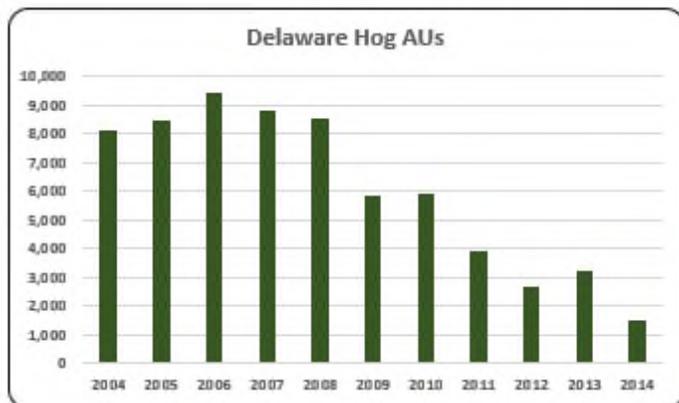
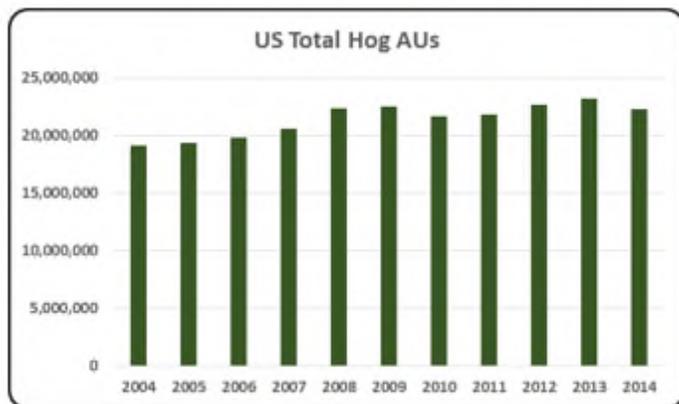
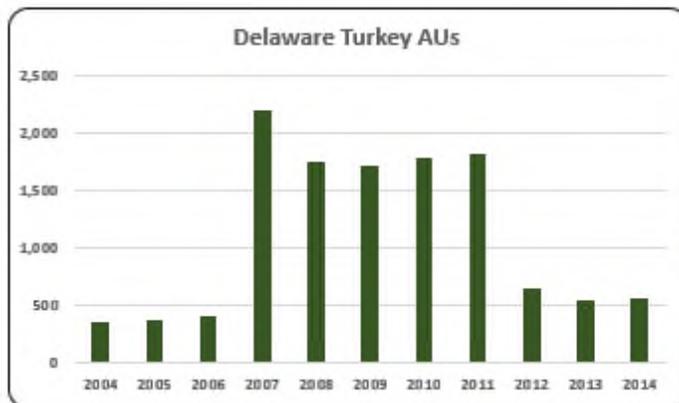
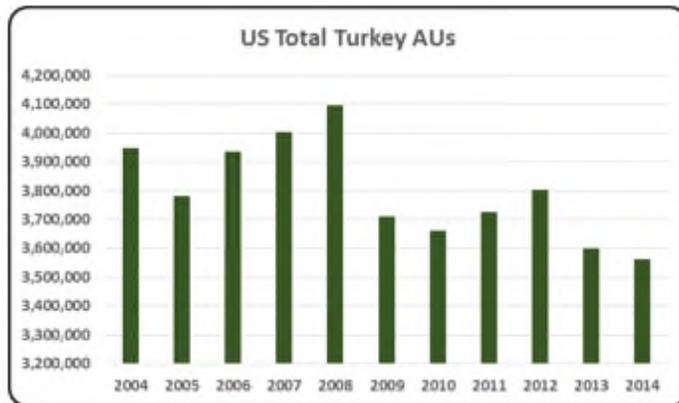
- The most important animal production in Delaware is the broiler production with 98.2% of all AUs in the state in 2014. Broiler AUs steadily declined since 2008, but in 2014 broiler AUs rose to a record level of 733,651.



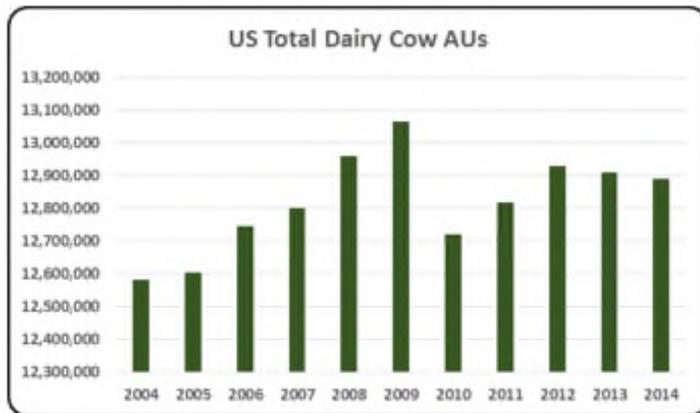
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



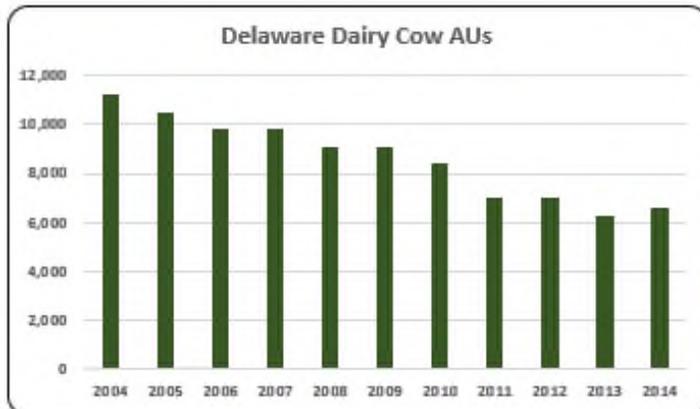
- Layer animal production is the smallest of all animal production in the state of Delaware with only 350, on average, layer AUs from 2004 to 2014.



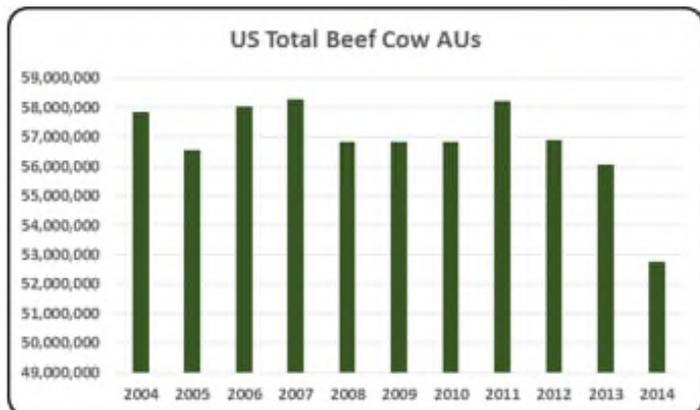
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Delaware turkey AUs in 2014 were 0.08% (567) of all AUs in the state. Turkey AUs have been diminishing since record high numbers in 2007 (2,193 turkey AUs).
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- The hog industry has been dwindling (9,450) since 2006 Hog AUs in Delaware and in 2014 reached a record low of 1,515 hog AUs (a 84% reduction compared to the numbers in 2006).



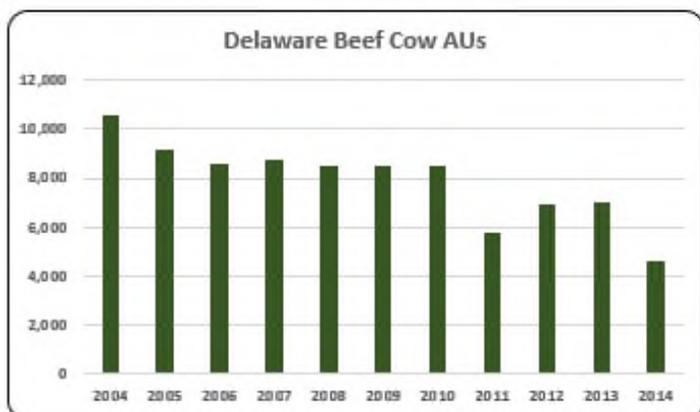
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- A distant second to broiler production, the dairy cow AUs in Delaware were about 1% (6,580) of all AUs in the state in 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Representing only 0.6% (4,635) of all AUs in the state, Delaware beef cow AUs have been decreasing over the past decade. Beef cow AUs shrank 56% compared to the beef cow AUs in 2004.

Delaware Additional Information and Methodology

Animal agriculture is an important part of Delaware's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Delaware, of interest is the degree to which the industry impacts the Delaware economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Delaware animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Delaware's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Delaware which have occurred. As shown in this state report, Delaware has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Delaware. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Delaware Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Delaware's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Delaware, \$1.471 to \$1.996 million in total economic activity, \$0.214 to \$0.287 in household wages and 5 to 7 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.5226 | \$ 0.2143 | 5.5 |
| | Hogs, Pigs, and Other | \$ 1.4708 | \$ 0.2192 | 5.8 |
| | Poultry and Eggs | \$ 1.9962 | \$ 0.2869 | 6.6 |
| | Dairy | \$ 1.6241 | \$ 0.2502 | 6.6 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 10,560 | 9,180 | 8,610 | 8,730 | 8,475 | 8,475 | 8,475 | 5,805 | 6,900 | 7,020 | 4,635 |
| | Hog and Pig AUs | 8,100 | 8,430 | 9,450 | 8,805 | 8,550 | 5,835 | 5,910 | 3,885 | 2,700 | 3,225 | 1,515 |
| | Broiler AUs | 704,686 | 730,732 | 720,232 | 722,913 | 716,213 | 681,756 | 689,206 | 654,386 | 637,227 | 648,018 | 733,651 |
| | Turkey AUs | 363 | 372 | 404 | 2,193 | 1,753 | 1,717 | 1,789 | 1,821 | 650 | 543 | 567 |
| | Egg Layer AUs | 216 | 238 | 230 | 457 | 444 | 388 | 385 | 388 | 362 | 367 | 373 |
| | Dairy AUs | 11,200 | 10,500 | 9,800 | 9,800 | 9,100 | 9,100 | 8,400 | 7,000 | 7,000 | 6,300 | 6,580 |
| | Total Animal Units | 735,125 | 759,452 | 748,726 | 752,898 | 744,534 | 707,272 | 714,165 | 673,284 | 654,839 | 665,472 | 747,320 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 5,610 | \$ 6,210 | \$ 6,389 | \$ 6,316 | \$ 5,929 | \$ 5,114 | \$ 4,233 | \$ 5,472 | \$ 5,664 | \$ 5,014 | \$ 6,499 |
| | Hogs and Pigs (\$1,000) | \$ 2,628 | \$ 2,925 | \$ 2,487 | \$ 2,947 | \$ 2,879 | \$ 1,793 | \$ 2,260 | \$ 1,645 | \$ 1,524 | \$ 2,586 | \$ 1,137 |
| | Broilers (\$1,000) | \$ 686,458 | \$ 741,520 | \$ 613,206 | \$ 734,942 | \$ 726,294 | \$ 730,606 | \$ 783,395 | \$ 699,791 | \$ 752,600 | \$ 929,196 | \$ 1,103,985 |
| | Turkeys (\$1,000) | \$ 337 | \$ 357 | \$ 422 | \$ 457 | \$ 500 | \$ 542 | \$ 585 | \$ 627 | \$ 670 | \$ 713 | \$ 755 |
| | Eggs (\$1,000) | \$ 1,685 | \$ 1,020 | \$ 1,131 | \$ 1,856 | \$ 2,237 | \$ 1,592 | \$ 1,748 | \$ 1,916 | \$ 2,149 | \$ 2,428 | \$ 2,819 |
| | Milk (\$1,000) | \$ 21,675 | \$ 21,173 | \$ 15,276 | \$ 22,148 | \$ 20,570 | \$ 14,484 | \$ 16,560 | \$ 19,215 | \$ 17,822 | \$ 19,209 | \$ 23,305 |
| | Other | \$ 1,952 | \$ 1,870 | \$ 1,788 | \$ 1,707 | \$ 1,625 | \$ 1,543 | \$ 1,462 | \$ 1,380 | \$ 1,298 | \$ 1,217 | \$ 1,135 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 1,952 | \$ 1,870 | \$ 1,788 | \$ 1,707 | \$ 1,625 | \$ 1,543 | \$ 1,462 | \$ 1,380 | \$ 1,298 | \$ 1,217 | \$ 1,135 |
| | Total (\$1,000) | \$ 720,344 | \$ 775,075 | \$ 640,699 | \$ 770,373 | \$ 760,034 | \$ 755,675 | \$ 810,242 | \$ 730,047 | \$ 781,727 | \$ 960,362 | \$ 1,139,636 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|----------|---------|----------|----------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 89 | 92 | 155 | 137 | |
| | Cattle feedlots (112112) | 30 | 25 | 21 | 2 | |
| | Dairy cattle and milk production (11212) | 91 | 78 | 63 | 32 | |
| | Hog and pig farming (1122) | 26 | 14 | 13 | 16 | |
| | Poultry and egg production (1123) | 822 | 809 | 777 | 645 | |
| | Sheep and goat farming (1124) | 11 | 38 | 77 | 31 | |
| | Animal aquaculture and other animal production (1125,1129) | 164 | 250 | 211 | 520 | |
| Value of Sales (\$1,000) | Cattle and Calves | 9,495 | 3,254 | 7,567 | 9,489 | |
| | Hogs and Pigs | 6,582 | 2,853 | 2,754 | 1,427 | |
| | Poultry and Eggs | 553,635 | 440,774 | 837,378 | 811,301 | |
| | Milk and Other Dairy Products | 19,357 | 20,651 | 21,715 | 16,593 | |
| | Aquaculture | withheld | 240 | withheld | withheld | |
| | Other (calculated) | 1,829 | 677 | 2,986 | 289 | |
| | Total | | 590,898 | 468,449 | 872,400 | 839,099 |
| Input Purchases | Livestock and poultry purchased | (Farms) | 1,122 | 1,039 | 981 | 947 |
| | | \$1,000 | 63,980 | 55,182 | 102,328 | 94,265 |
| | Breeding livestock purchased | (Farms) | n/a | 158 | 131 | 151 |
| | | \$1,000 | n/a | 444 | 1,043 | 1,871 |
| | Other livestock and poultry purchased | (Farms) | n/a | 928 | 899 | 842 |
| | | \$1,000 | n/a | 54,738 | 101,284 | 92,394 |
| | Feed purchased | (Farms) | 1,405 | 1,540 | 1,426 | 1,602 |
| | \$1,000 | 363,258 | 207,528 | 416,368 | 503,159 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 9,895 | \$ 1,393 | 36 | \$ 360 |
| | Hogs, Pigs, and Other | \$ 3,342 | \$ 498 | 13 | \$ 129 |
| | Poultry and Eggs | \$ 2,210,911 | \$ 317,759 | 7,263 | \$ 82,236 |
| | Dairy | \$ 37,850 | \$ 5,831 | 154 | \$ 1,509 |
| | Total | \$ 2,261,998 | \$ 325,481 | 7,466 | \$ 84,234 |
| Change from 2004 to 2014 | Cattle and Calves | \$ (809) | \$ (114) | (3) | \$ (29) |
| | Hogs, Pigs, and Other | \$ (5,100) | \$ (760) | (20) | \$ (197) |
| | Poultry and Eggs | \$ 488,537 | \$ 70,214 | 1,605 | \$ 18,171 |
| | Dairy | \$ (6,267) | \$ (965) | (26) | \$ (250) |
| | Total | \$ 476,361 | \$ 68,375 | 1,556 | \$ 17,695 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 1.5226 | \$ 0.2143 | 5.5 | |
| | Hogs, Pigs, and Other | \$ 1.4708 | \$ 0.2192 | 5.8 | |
| | Poultry and Eggs | \$ 1.9962 | \$ 0.2869 | 6.6 | |
| | Dairy | \$ 1.6241 | \$ 0.2502 | 6.6 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 5.6% | |
| | Total | | | 25.9% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: FLORIDA

Florida Executive Summary

The use of soybean meal as a key feed ingredient is a modest part of Florida's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Florida. The success of Florida animal agriculture in turn has an impact on the rest of the state and regional economies. For example, in the state of Florida during 2014 animal agriculture contributed:

- \$3.8 billion in economic output
- 20,782 jobs
- \$698.6 million in earnings
- \$142.0 million in income taxes paid at local, state, and federal levels
- \$189.3 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Florida increased economic output by over \$918.3 million, boosted household earnings by \$166.9 million, contributed 5,075 additional jobs and paid \$33.9 million in additional tax revenues.

Florida's animal agriculture consumed about 220.0 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (93.1 thousand tons)
- Egg-Laying Hens (52.5 thousand tons)
- Dairy Cows (31.3 thousand tons)

This report examines animal agriculture in Florida over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Florida, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of Florida and beyond.

Florida Economic Impact of Animal Agriculture

Animal agriculture is a small part of Florida's economy. In 2014, Florida's animal agriculture contributed the following to the economy:

- About \$3.8 billion in economic output
- \$698.6 million in household earnings
- 20,782 jobs
- \$142.0 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Florida's animal agriculture has:

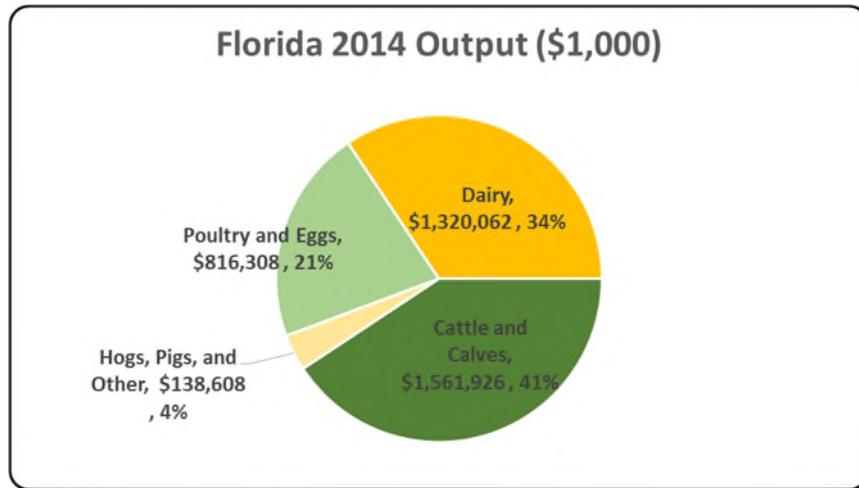
- Increased economic output by \$918.3 million
- Boosted household earnings by \$166.9 million
- Added 5,075 jobs
- Paid an additional \$33.9 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 3,836,904 | \$ 918,284 | 31.46% |
| Earnings (\$1,000) | \$ 698,593 | \$ 166,860 | 31.38% |
| Employment (Jobs) | 20,782 | 5,075 | 32.31% |
| Income Taxes Paid (\$1,000) | \$ 142,024 | \$ 33,923 | 31.38% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 189,340 | | |

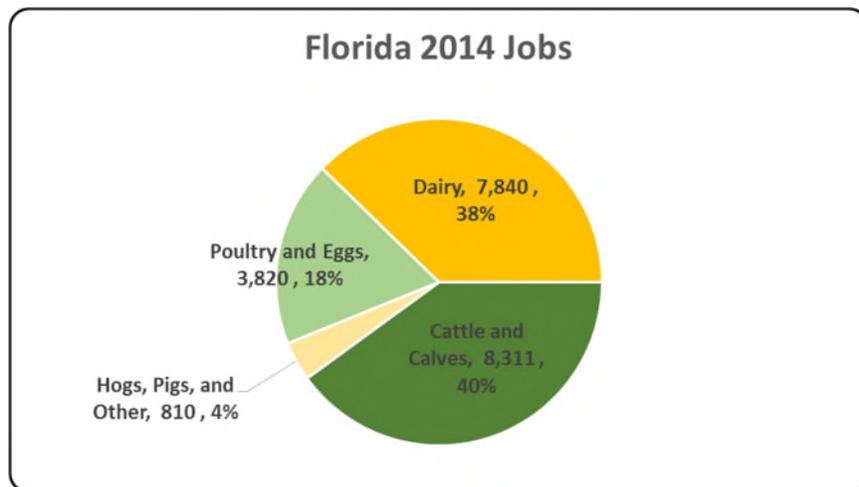
Florida Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Florida economy. Animal agriculture’s impact on Florida total economic output is about \$3.8 billion.



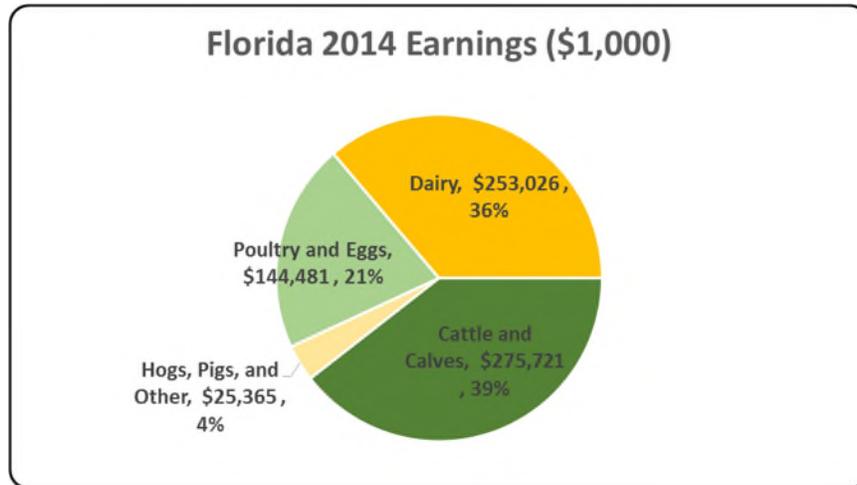
Florida Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Florida in terms of animal agriculture jobs. As shown, animal agriculture contributes about 20,782 jobs within and outside of animal agriculture.



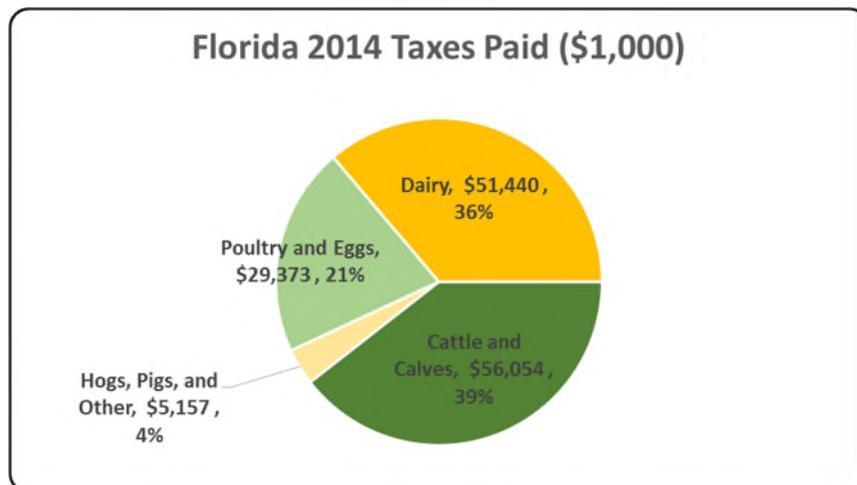
Florida Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Florida economy in terms of earnings. Florida’s animal agriculture contributed about \$698.6 million to household earnings in 2014.



Florida Taxes Paid by Animal Agriculture

Florida’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$142.0 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$189.3 million in property taxes paid by all of Florida agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



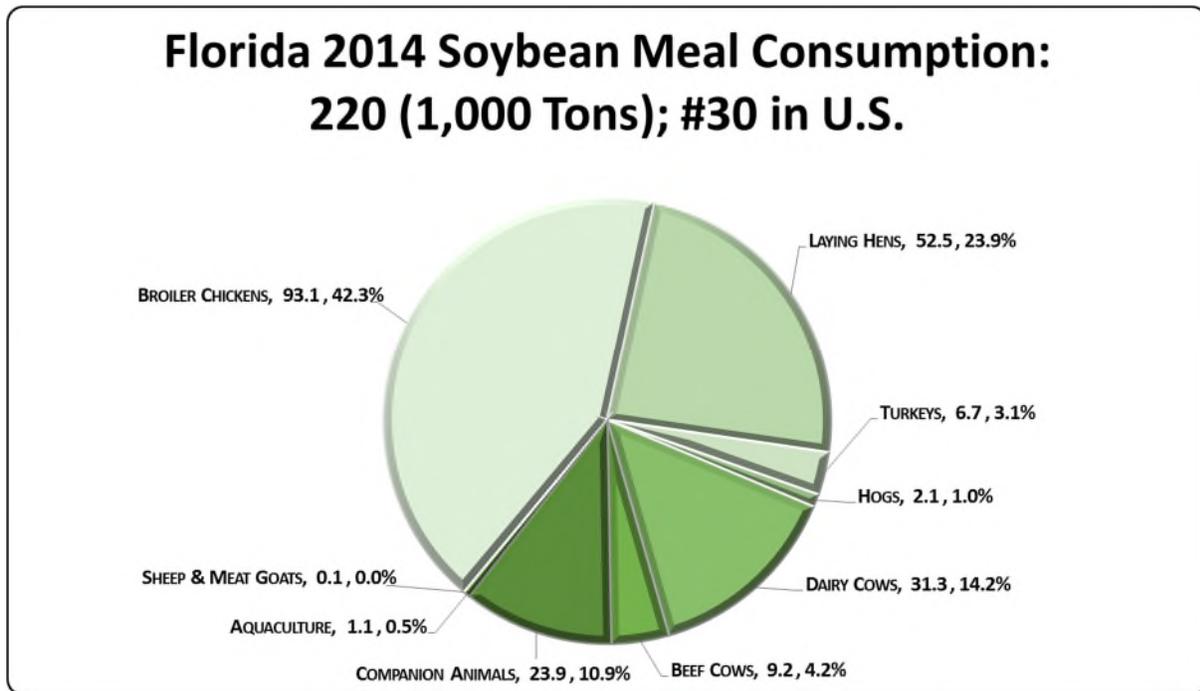
Florida Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Florida’s animal agriculture consumed almost 220.0 thousand tons of soybean meal in 2014, placing the state as #30 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (93.1 thousand tons)
- Egg-Laying Hens (52.5 thousand tons)
- Dairy Cows (31.3 thousand tons)

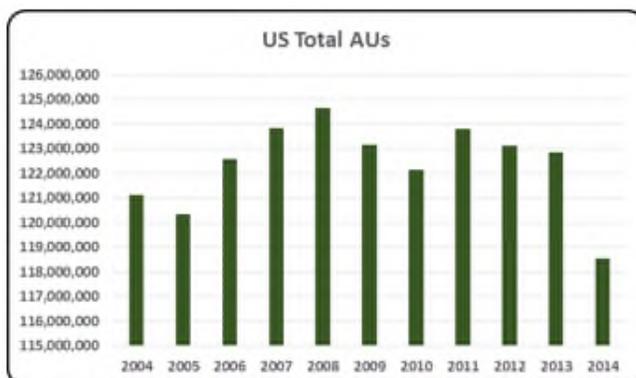


Florida Animal Unit (AU) Trends

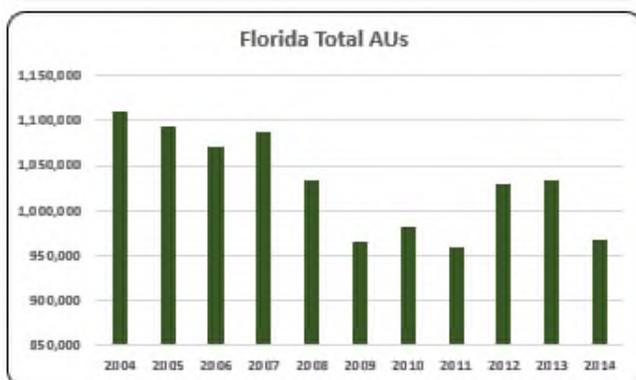
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Florida. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Florida and to give perspective on Florida's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

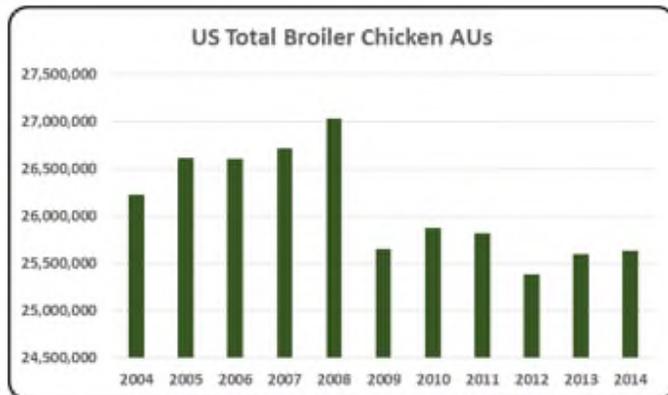
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Florida, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (541.7 thousand AUs), Broilers (200.5 thousand AUs), and Dairy Cows (172.2 thousand AUs). Total animal units in Florida during 2014 were 967.1 thousand AUs.



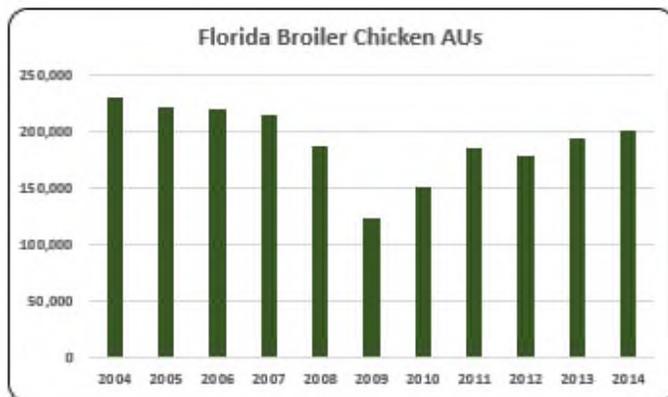
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



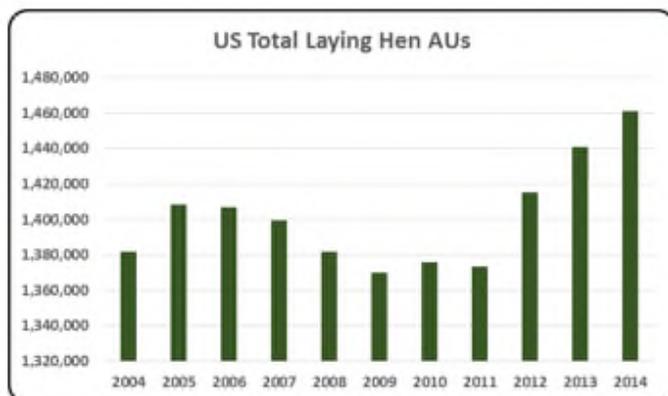
- In 2014 there were 967,054 AUs in Florida; 56% (541,650) of which were beef cow AUs.



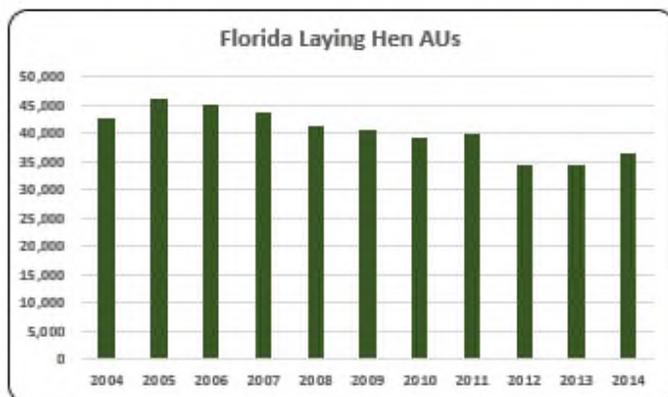
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



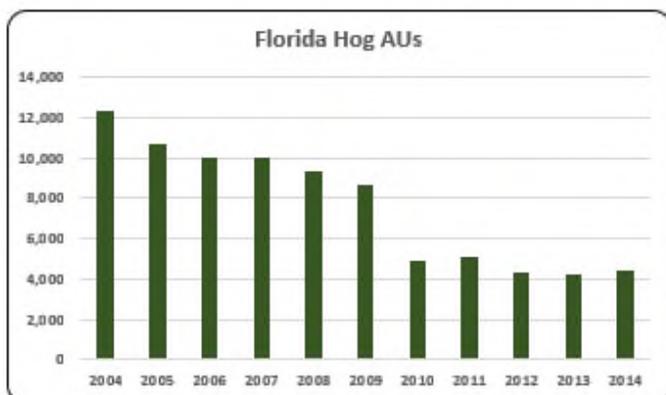
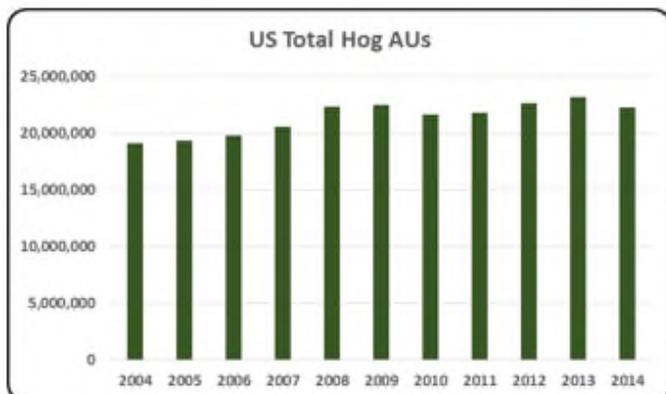
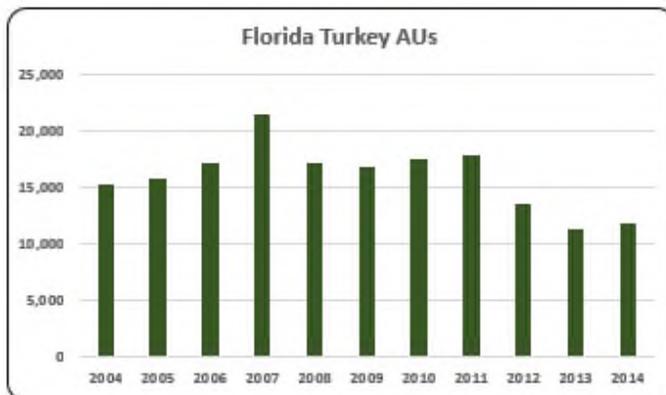
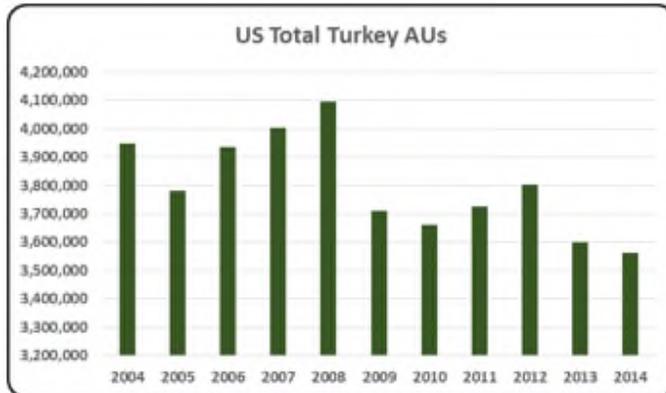
- In 2014 there were 200,469 broiler AUs in the state representing about 20.7% of all AUs in Florida. Although the number of broiler AUs in 2014 was below the highest number reached in the 2004-2014 decade (229,821 in 2004), it increased 3.6% year-over-year.



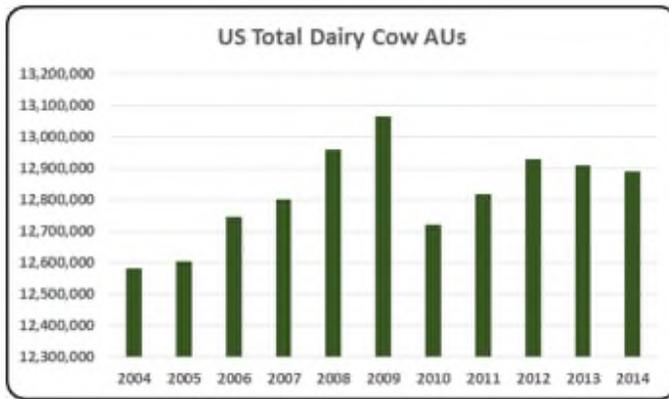
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



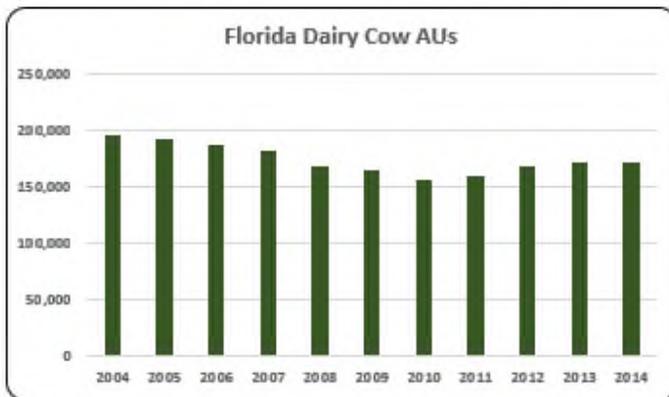
- The average layer AUs in Florida during the 2004-2014 decade was 40,354 but layer AUs fell 21% compared to the 2005 highest layer AUs (45,924) in the state. Layer AUs in 2014 represented 2.49% of all layer AUs in the country during that year.



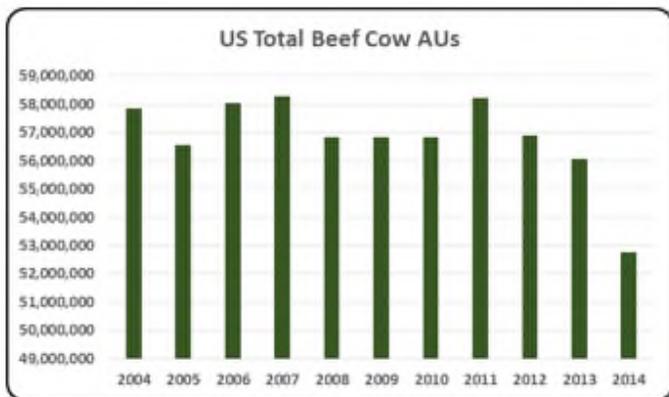
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- In 2014 turkey AUs declined 45% relative to the 2007 record turkey AUs of decade (2004-2014) (21,463). In 2014 turkey AUs represented 1.23% of all AUs in the state of Florida.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production in Florida was the smallest (4,410) of all animal production in the state in 2014. Overall hog numbers have been declining, and since 2008 hog AUs have been below 10,000.



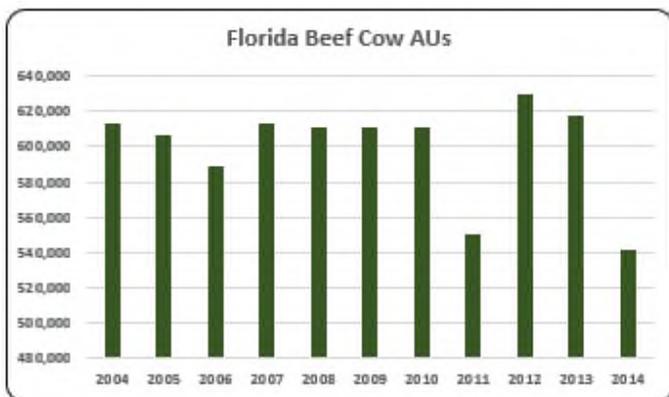
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow animal production makes up about 17.8% (172,200) of all AUs in the state. Dairy cow AUs have started to gradually recover from the low in 2010 (156,800).



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production is the most important animal production in the state, however beef cow AUs declined 12.3% from 2013. On average, from 2004 to 2014 there were 599,414 beef cow AUs in the state.

Florida Additional Information and Methodology

Animal agriculture is a part of Florida's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Florida, of interest is the degree to which the industry impacts the Florida economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Florida animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Florida's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Florida which have occurred. As shown in this state report, Florida has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Florida. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Florida Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Florida's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Florida, \$1.657 to \$1.909 million in total economic activity, \$0.297 to \$0.358 in household wages and 8 to 11 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.9085 | \$ 0.3369 | 10.2 |
| | Hogs, Pigs, and Other | \$ 1.6574 | \$ 0.3033 | 9.7 |
| | Poultry and Eggs | \$ 1.6752 | \$ 0.2965 | 7.8 |
| | Dairy | \$ 1.8672 | \$ 0.3579 | 11.1 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 613,050 | 606,600 | 589,050 | 613,650 | 610,650 | 610,650 | 610,650 | 550,350 | 629,700 | 617,550 | 541,650 |
| | Hog and Pig AUs | 12,300 | 10,650 | 10,050 | 10,050 | 9,300 | 8,700 | 4,950 | 5,100 | 4,350 | 4,260 | 4,410 |
| | Broiler AUs | 229,821 | 221,282 | 220,930 | 215,580 | 188,120 | 123,581 | 152,143 | 185,680 | 178,844 | 193,564 | 200,469 |
| | Turkey AUs | 15,355 | 15,748 | 17,112 | 21,463 | 17,156 | 16,805 | 17,504 | 17,816 | 13,658 | 11,393 | 11,899 |
| | Egg Layer AUs | 42,708 | 45,924 | 45,084 | 43,792 | 41,360 | 40,508 | 39,176 | 40,012 | 34,391 | 34,517 | 36,426 |
| | Dairy AUs | 196,000 | 193,200 | 187,600 | 182,000 | 168,000 | 165,200 | 156,800 | 159,600 | 168,000 | 172,200 | 172,200 |
| | Total Animal Units | 1,109,234 | 1,093,404 | 1,069,826 | 1,086,535 | 1,034,586 | 965,444 | 981,223 | 958,558 | 1,028,943 | 1,033,484 | 967,054 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 409,034 | \$ 450,871 | \$ 442,250 | \$ 380,746 | \$ 333,654 | \$ 311,595 | \$ 395,161 | \$ 451,169 | \$ 532,525 | \$ 533,592 | \$ 818,405 |
| | Hogs and Pigs (\$1,000) | \$ 5,286 | \$ 4,019 | \$ 3,244 | \$ 3,013 | \$ 2,813 | \$ 3,274 | \$ 2,297 | \$ 2,759 | \$ 2,318 | \$ 2,293 | \$ 3,114 |
| | Broilers (\$1,000) | \$ 208,440 | \$ 201,564 | \$ 159,300 | \$ 179,654 | \$ 173,144 | \$ 115,164 | \$ 151,493 | \$ 175,889 | \$ 178,500 | \$ 238,430 | \$ 246,455 |
| | Turkeys (\$1,000) | \$ 14,247 | \$ 15,107 | \$ 17,855 | \$ 24,753 | \$ 23,172 | \$ 15,540 | \$ 20,819 | \$ 23,350 | \$ 19,809 | \$ 13,045 | \$ 21,841 |
| | Eggs (\$1,000) | \$ 159,878 | \$ 100,723 | \$ 119,687 | \$ 186,471 | \$ 234,515 | \$ 152,616 | \$ 150,746 | \$ 177,861 | \$ 183,258 | \$ 167,335 | \$ 218,994 |
| | Milk (\$1,000) | \$ 432,576 | \$ 422,778 | \$ 345,189 | \$ 460,776 | \$ 465,560 | \$ 351,520 | \$ 441,531 | \$ 549,098 | \$ 521,820 | \$ 569,537 | \$ 706,974 |
| | Other | \$ 54,838 | \$ 57,406 | \$ 59,974 | \$ 62,542 | \$ 65,109 | \$ 67,677 | \$ 70,245 | \$ 72,813 | \$ 75,380 | \$ 77,948 | \$ 80,516 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 54,838 | \$ 57,406 | \$ 59,974 | \$ 62,542 | \$ 65,109 | \$ 67,677 | \$ 70,245 | \$ 72,813 | \$ 75,380 | \$ 77,948 | \$ 80,516 |
| | Total (\$1,000) | \$ 1,284,299 | \$ 1,252,468 | \$ 1,147,498 | \$ 1,297,954 | \$ 1,297,967 | \$ 1,017,386 | \$ 1,232,292 | \$ 1,452,938 | \$ 1,513,610 | \$ 1,602,180 | \$ 2,096,299 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|---------------------------------|---|----------------|------------|-----------|-----------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 12,040 | 15,304 | 16,819 | 17,351 | |
| | Cattle feedlots (112112) | 309 | - | 240 | - | |
| | Dairy cattle and milk production (11212) | 296 | 517 | 210 | 187 | |
| | Hog and pig farming (1122) | 468 | 601 | 594 | 581 | |
| | Poultry and egg production (1123) | 560 | 739 | 1,185 | 1,106 | |
| | Sheep and goat farming (1124) | 272 | 608 | 1,260 | 1,796 | |
| | Animal aquaculture and other animal production (1125,1129) | 3,202 | 8,281 | 8,531 | 7,904 | |
| Value of Sales (\$1,000) | Cattle and Calves | 310,548 | 328,820 | 436,193 | 531,869 | |
| | Hogs and Pigs | 9,670 | 3,154 | 2,220 | 2,158 | |
| | Poultry and Eggs | 403,366 | 336,295 | 410,148 | 378,453 | |
| | Milk and Other Dairy Products | 383,616 | 371,691 | 412,211 | 508,847 | |
| | Aquaculture | 76,696 | 56,949 | 61,340 | 88,463 | |
| | Other (calculated) | 100,489 | 103,930 | 206,888 | 60,021 | |
| | Total | 1,284,385 | 1,200,839 | 1,529,000 | 1,569,811 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 6,697 | 8,931 | 8,322 | 9,474 |
| | | \$1,000 | 145,770 | 147,080 | 175,186 | 163,843 |
| | Breeding livestock purchased | (Farms) | <i>n/a</i> | 5,337 | 5,111 | 5,623 |
| | | \$1,000 | <i>n/a</i> | 49,880 | 59,350 | 61,772 |
| | Other livestock and poultry purchased | (Farms) | <i>n/a</i> | 4,919 | 4,460 | 5,138 |
| | | \$1,000 | <i>n/a</i> | 97,200 | 115,836 | 102,071 |
| | Feed purchased | (Farms) | 14,829 | 26,515 | 27,297 | 30,765 |
| | \$1,000 | 446,861 | 410,603 | 547,947 | 750,800 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|---------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,561,926 | \$ 275,721 | 8,311 | \$ 56,054 |
| | Hogs, Pigs, and Other | \$ 138,608 | \$ 25,365 | 810 | \$ 5,157 |
| | Poultry and Eggs | \$ 816,308 | \$ 144,481 | 3,820 | \$ 29,373 |
| | Dairy | \$ 1,320,062 | \$ 253,026 | 7,840 | \$ 51,440 |
| | Total | \$ 3,836,904 | \$ 698,593 | 20,782 | \$ 142,024 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 583,599 | \$ 103,020 | 3,105 | \$ 20,944 |
| | Hogs, Pigs, and Other | \$ 13,723 | \$ 2,511 | 80 | \$ 511 |
| | Poultry and Eggs | \$ 13,144 | \$ 2,326 | 62 | \$ 473 |
| | Dairy | \$ 307,817 | \$ 59,002 | 1,828 | \$ 11,995 |
| | Total | \$ 918,284 | \$ 166,860 | 5,075 | \$ 33,923 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.9085 | \$ 0.3369 | 10.2 | |
| | Hogs, Pigs, and Other | \$ 1.6574 | \$ 0.3033 | 9.7 | |
| | Poultry and Eggs | \$ 1.6752 | \$ 0.2965 | 7.8 | |
| | Dairy | \$ 1.8672 | \$ 0.3579 | 11.1 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 0.0% |
| | Total | | | | 20.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: GEORGIA

Georgia Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Georgia's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Georgia. The success of Georgia animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Georgia during 2014 animal agriculture contributed:

- \$17.5 billion in economic output
- 76,948 jobs
- \$3.2 billion in earnings
- \$835.8 million in income taxes paid at local, state, and federal levels
- \$131.7 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Georgia increased economic output by over \$4.4 billion, boosted household earnings by \$799.1 million, contributed 19,284 additional jobs and paid \$210.4 million in additional tax revenues.

Georgia's animal agriculture consumed about 2.0 million tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (1.9 million tons)
- Egg-Laying Hens (77.4 thousand tons)
- Hogs (26.8 thousand tons)

This report examines animal agriculture in Georgia over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Georgia, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Georgia and beyond.

Georgia Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Georgia's economy. In 2014, Georgia's animal agriculture contributed the following to the economy:

- About \$17.5 billion in economic output
- \$3.2 billion in household earnings
- 76,948 jobs
- \$835.8 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Georgia's animal agriculture has:

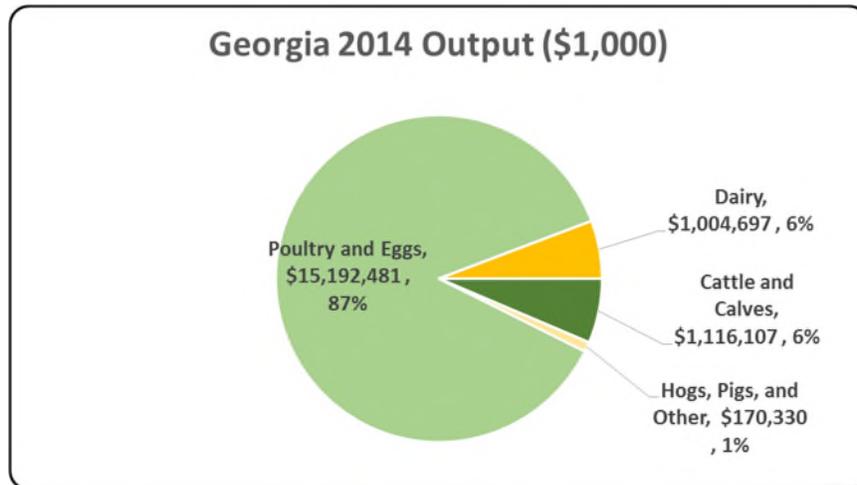
- Increased economic output by \$4.4 billion
- Boosted household earnings by \$799.1 million
- Added 19,284 jobs
- Paid an additional \$210.4 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 17,483,615 | \$ 4,395,184 | 33.58% |
| Earnings (\$1,000) | \$ 3,174,274 | \$ 799,055 | 33.64% |
| Employment (Jobs) | 76,948 | 19,284 | 33.44% |
| Income Taxes Paid (\$1,000) | \$ 835,786 | \$ 210,391 | 33.64% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 131,712 | | |

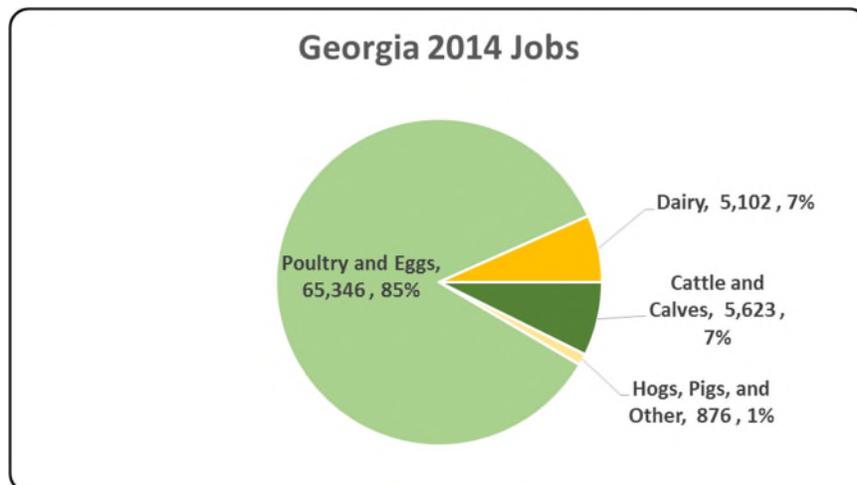
Georgia Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Georgia economy. Animal agriculture’s impact on Georgia total economic output is about \$17.5 billion.



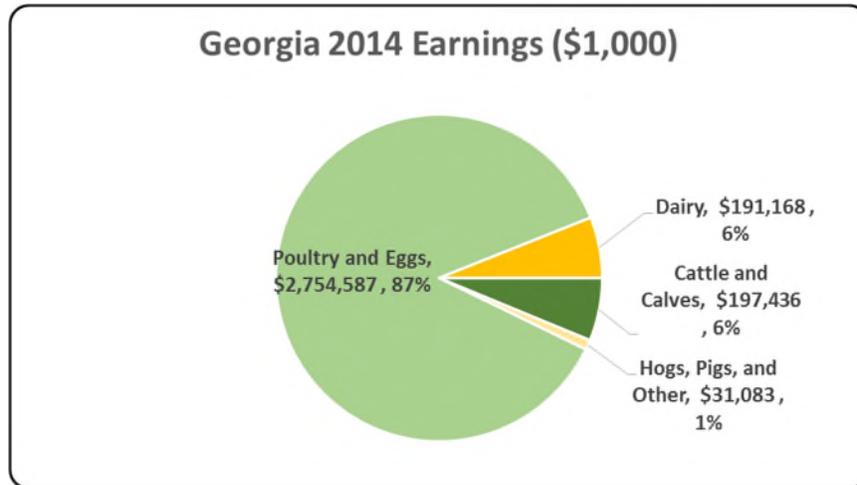
Georgia Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Georgia in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Georgia total jobs, contributing 76,948 jobs within and outside of animal agriculture.



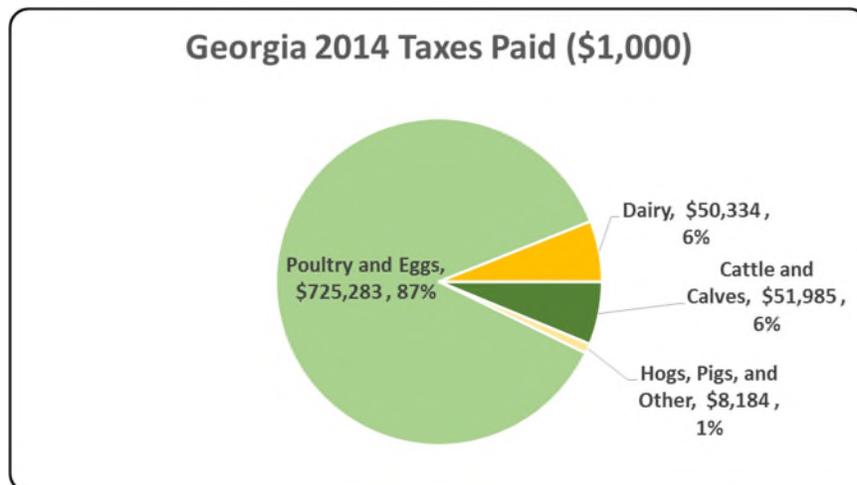
Georgia Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Georgia economy in terms of earnings. Georgia’s animal agriculture contributed about \$3.2 billion to household earnings in 2014.



Georgia Taxes Paid by Animal Agriculture

Georgia’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$835.8 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$131.7 million in property taxes paid by all of Georgia agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



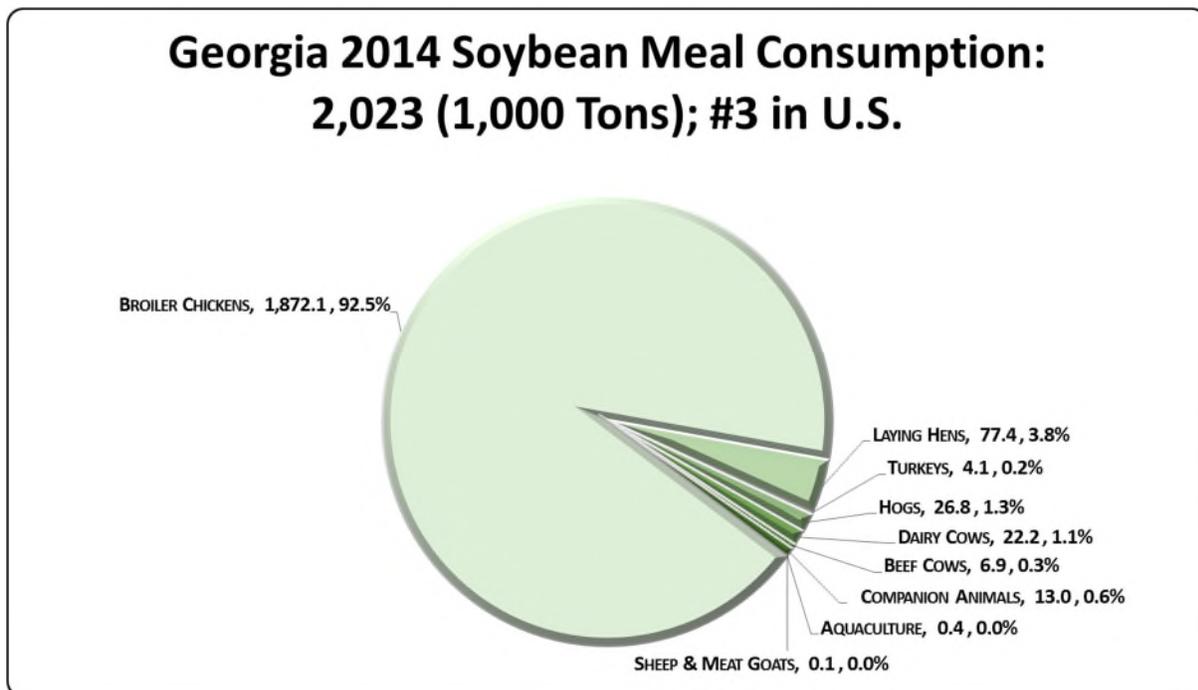
Georgia Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Georgia's animal agriculture consumed almost 2.0 million tons of soybean meal in 2014, placing the state as #3 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (1.9 million tons)
- Egg-Laying Hens (77.4 thousand tons)
- Hogs (26.8 thousand tons)

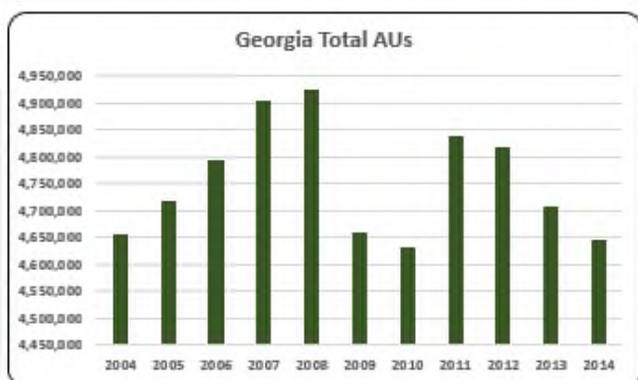
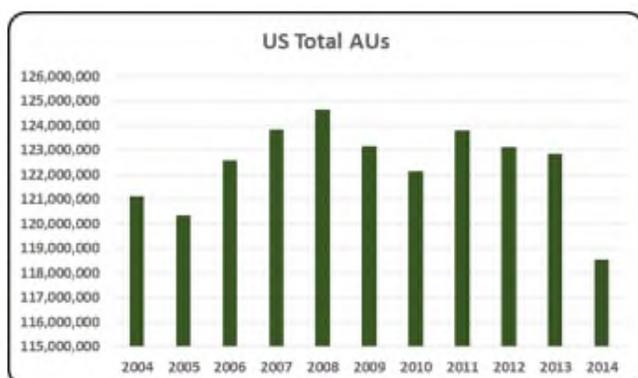


Georgia Animal Unit (AU) Trends

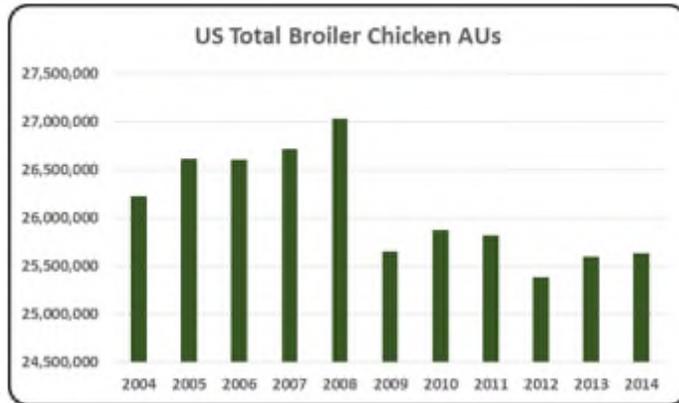
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Georgia. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Georgia and to give perspective on Georgia's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

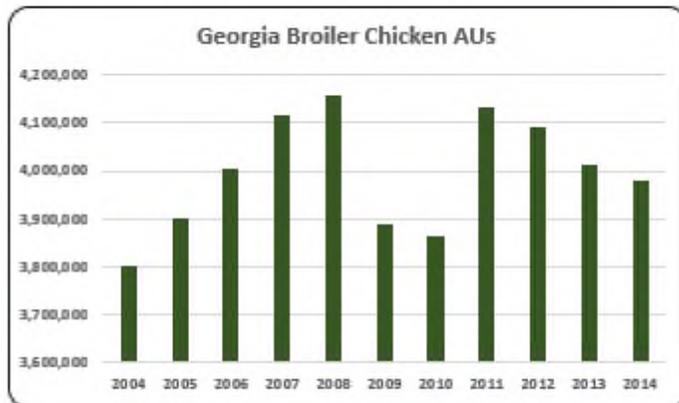
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Georgia, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (3,979.9 thousand AUs), Beef Cows (389.9 thousand AUs), and Dairy Cows (112.0 thousand AUs). Total animal units in Georgia during 2014 were 4,646.6 thousand AUs.



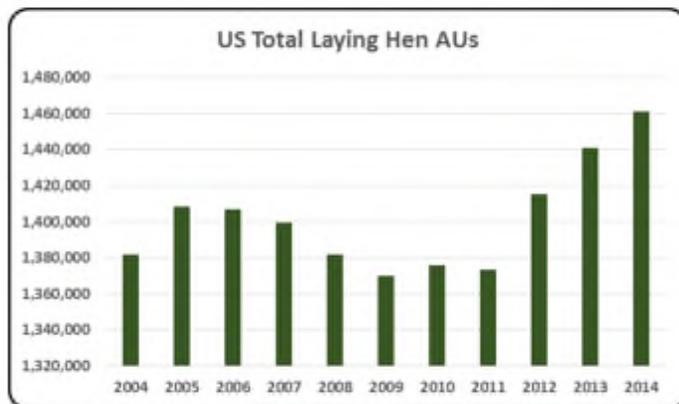
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- 2014 total AUs in Georgia was 4,646.6 thousand comprising about 3.9% of all AUs in the U.S. As a number one broiler producers in the country, Georgia's 2014 broiler AUs represented 15.5% of the U.S. total.



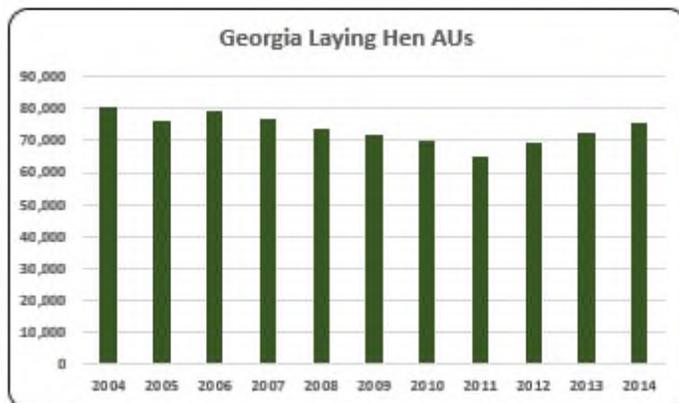
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



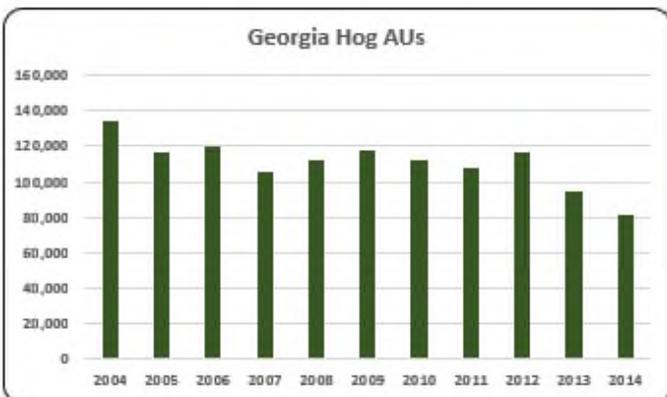
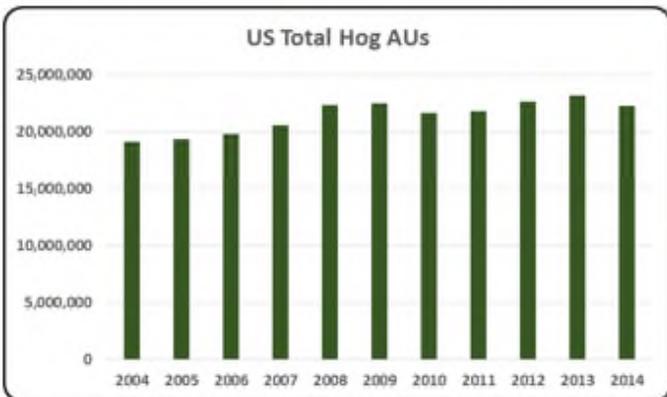
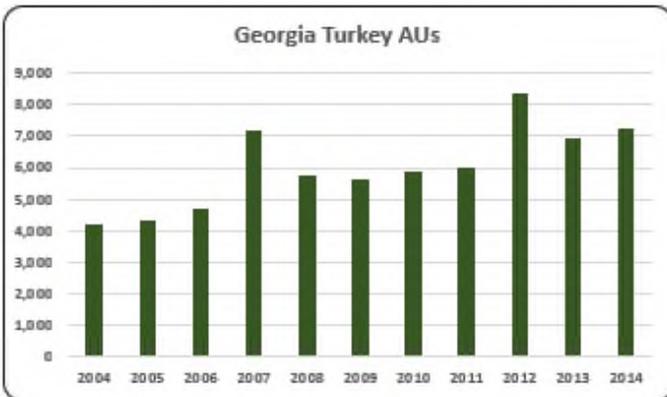
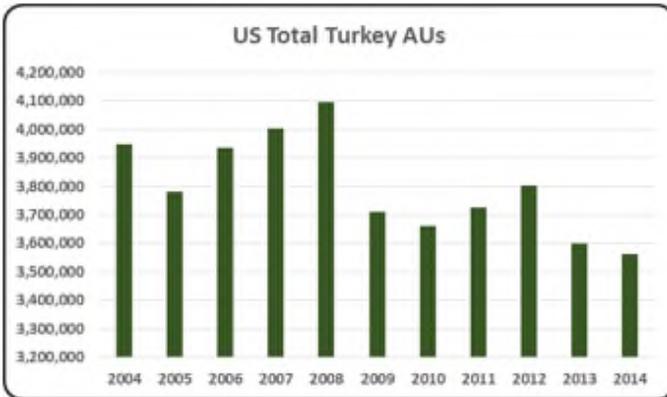
- In 2014, broiler AUs accounted for about 85.7% of all AUs in Georgia. Broiler AUs recovered in 2011 but declined once again for the next three years, and in 2014 broilers AUs were 3.7% below 2011 numbers (4,131.8 thousand).



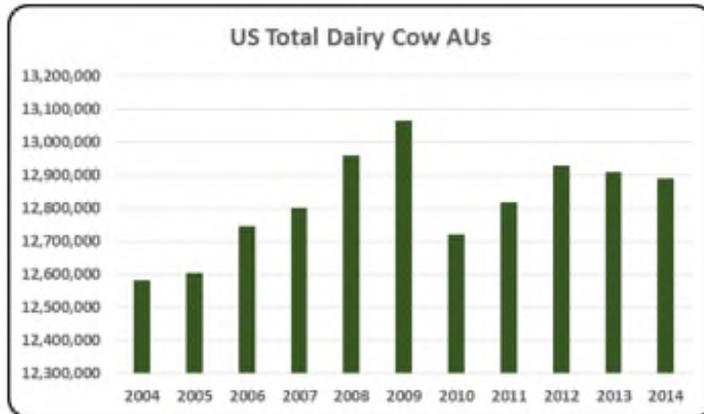
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



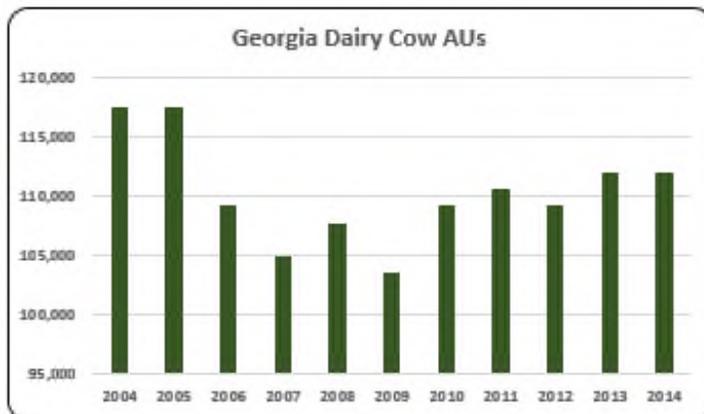
- Layer AUs have climbed since 2011, and in 2014 layer AUs increased 4.7% to 75,754 relative to the previous year and 16% compared to 2011 numbers.



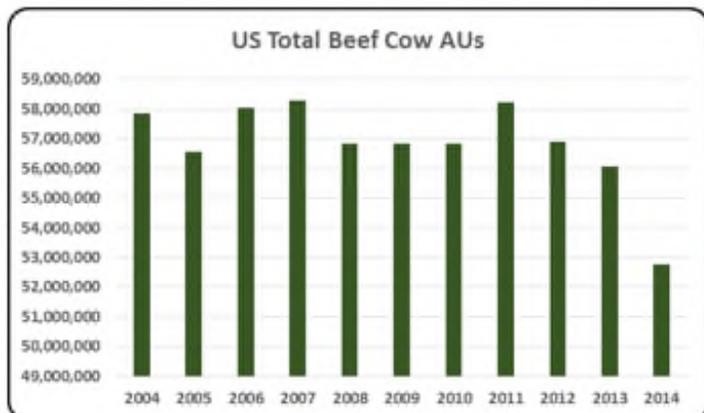
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Georgia’s turkey industry is the smallest of all animal production representing 0.16% (7,272) of all AUs in the state in 2014.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog AUs have varied over the years, but numbers have been declining since 2013 and 2014, hog AUs reached the lowest number (81,750) of the decade, falling 14.1% year-over-year.



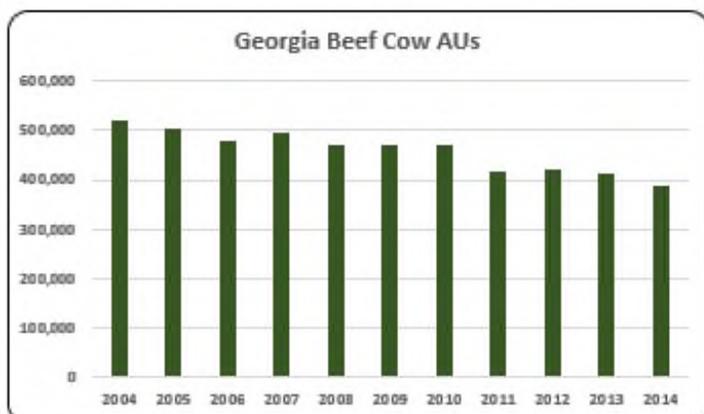
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- There were 112,000 dairy cow AUs in 2014, representing 2.4% of all AUs in the state. Dairy cow AUs were the highest during 2004 and 2005, but since then have ranged from 103,600 in 2009 to 112,000 in 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Even though beef cow production is the second most important animal production in the state, there has been a downward trend with a 25% reduction in the number beef cow AUs from 2004 to 2014.

Georgia Additional Information and Methodology

Animal agriculture is an important part of Georgia's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Georgia, of interest is the degree to which the industry impacts the Georgia economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Georgia animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Georgia's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Georgia which have occurred. As shown in this state report, Georgia has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Georgia. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Georgia Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Georgia's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Georgia, \$1.86 to \$2.769 million in total economic activity, \$0.34 to \$0.502 in household wages and 10 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.1114 | \$ 0.3735 | 10.6 |
| | Hogs, Pigs, and Other | \$ 1.8604 | \$ 0.3395 | 9.6 |
| | Poultry and Eggs | \$ 2.7687 | \$ 0.5020 | 11.9 |
| | Dairy | \$ 2.2599 | \$ 0.4300 | 11.5 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 518,700 | 501,450 | 478,050 | 496,500 | 470,700 | 470,700 | 470,700 | 417,000 | 420,300 | 411,600 | 389,850 |
| | Hog and Pig AUs | 133,950 | 116,925 | 119,475 | 105,450 | 112,545 | 117,300 | 111,900 | 107,700 | 116,700 | 95,175 | 81,750 |
| | Broiler AUs | 3,802,728 | 3,901,167 | 4,002,665 | 4,113,958 | 4,155,154 | 3,889,866 | 3,865,378 | 4,131,825 | 4,092,980 | 4,011,338 | 3,979,928 |
| | Turkey AUs | 4,232 | 4,340 | 4,716 | 7,207 | 5,760 | 5,642 | 5,877 | 5,982 | 8,347 | 6,963 | 7,272 |
| | Egg Layer AUs | 80,492 | 76,324 | 79,164 | 76,736 | 73,504 | 71,520 | 70,012 | 65,080 | 69,613 | 72,344 | 75,754 |
| | Dairy AUs | 117,600 | 117,600 | 109,200 | 105,000 | 107,800 | 103,600 | 109,200 | 110,600 | 109,200 | 112,000 | 112,000 |
| | Total Animal Units | 4,657,702 | 4,717,806 | 4,793,270 | 4,904,850 | 4,925,464 | 4,658,629 | 4,633,067 | 4,838,187 | 4,817,140 | 4,709,420 | 4,646,554 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 353,513 | \$ 315,397 | \$ 282,376 | \$ 261,954 | \$ 253,379 | \$ 249,687 | \$ 272,727 | \$ 336,853 | \$ 382,348 | \$ 382,907 | \$ 528,610 |
| | Hogs and Pigs (\$1,000) | \$ 74,147 | \$ 78,254 | \$ 60,835 | \$ 52,744 | \$ 52,730 | \$ 45,534 | \$ 43,517 | \$ 58,427 | \$ 64,807 | \$ 55,922 | \$ 54,824 |
| | Broilers (\$1,000) | \$ 2,857,580 | \$ 2,903,532 | \$ 2,543,688 | \$ 3,187,848 | \$ 3,435,648 | \$ 3,141,601 | \$ 3,317,461 | \$ 3,408,580 | \$ 3,812,750 | \$ 4,617,570 | \$ 4,808,012 |
| | Turkeys (\$1,000) | \$ 3,926 | \$ 4,163 | \$ 4,921 | \$ 8,311 | \$ 7,780 | \$ 5,218 | \$ 6,990 | \$ 7,840 | \$ 12,105 | \$ 7,972 | \$ 13,347 |
| | Eggs (\$1,000) | \$ 394,120 | \$ 347,680 | \$ 368,736 | \$ 437,491 | \$ 564,244 | \$ 468,599 | \$ 442,065 | \$ 488,812 | \$ 532,576 | \$ 585,797 | \$ 665,866 |
| | Milk (\$1,000) | \$ 237,888 | \$ 223,680 | \$ 202,176 | \$ 283,997 | \$ 283,195 | \$ 204,400 | \$ 256,680 | \$ 319,000 | \$ 304,669 | \$ 338,688 | \$ 444,576 |
| | Other | \$ 4,254 | \$ 7,502 | \$ 10,750 | \$ 13,998 | \$ 17,245 | \$ 20,493 | \$ 23,741 | \$ 26,989 | \$ 30,236 | \$ 33,484 | \$ 36,732 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 4,254 | \$ 7,502 | \$ 10,750 | \$ 13,998 | \$ 17,245 | \$ 20,493 | \$ 23,741 | \$ 26,989 | \$ 30,236 | \$ 33,484 | \$ 36,732 |
| | Total (\$1,000) | \$ 3,925,429 | \$ 3,880,208 | \$ 3,473,481 | \$ 4,246,343 | \$ 4,614,222 | \$ 4,135,532 | \$ 4,363,181 | \$ 4,646,501 | \$ 5,139,492 | \$ 6,022,340 | \$ 6,551,967 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 15,967 | 18,799 | 15,796 | 12,858 | |
| | Cattle feedlots (112112) | 399 | 317 | 313 | - | |
| | Dairy cattle and milk production (11212) | 569 | 527 | 487 | 232 | |
| | Hog and pig farming (1122) | 760 | 493 | 384 | 247 | |
| | Poultry and egg production (1123) | 3,257 | 3,632 | 3,860 | 4,158 | |
| | Sheep and goat farming (1124) | 424 | 1,010 | 1,544 | 1,912 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,364 | 6,197 | 6,301 | 4,027 | |
| Value of Sales (\$1,000) | Cattle and Calves | 234,379 | 240,070 | 342,392 | 403,172 | |
| | Hogs and Pigs | 109,855 | 65,384 | 68,369 | 56,386 | |
| | Poultry and Eggs | 2,602,734 | 2,780,214 | 4,246,765 | 4,773,837 | |
| | Milk and Other Dairy Products | 214,060 | 212,720 | 264,423 | 299,548 | |
| | Aquaculture | 2,943 | 5,310 | 14,075 | 26,858 | |
| | Other (calculated) | 23,301 | 28,458 | 34,572 | 16,560 | |
| | Total | 3,187,272 | 3,332,156 | 4,970,596 | 5,576,361 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 10,408 | 12,342 | 10,114 | 10,995 | |
| | | \$1,000 | 396,933 | 372,108 | 871,341 | 927,465 |
| | Breeding livestock purchased | (Farms) n/a | 3,460 | 4,907 | 5,728 | |
| | | \$1,000 | n/a | 27,615 | 43,265 | 99,642 |
| | Other livestock and poultry purchased | (Farms) n/a | 7,172 | 6,399 | 6,714 | |
| | | \$1,000 | n/a | 344,493 | 828,076 | 827,823 |
| Feed purchased | (Farms) | 21,119 | 32,119 | 26,287 | 26,118 | |
| | \$1,000 | 1,427,778 | 1,365,162 | 2,121,379 | 2,913,851 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,116,107 | \$ 197,436 | 5,623 | \$ 51,985 |
| | Hogs, Pigs, and Other | \$ 170,330 | \$ 31,083 | 876 | \$ 8,184 |
| | Poultry and Eggs | \$ 15,192,481 | \$ 2,754,587 | 65,346 | \$ 725,283 |
| | Dairy | \$ 1,004,697 | \$ 191,168 | 5,102 | \$ 50,334 |
| | Total | \$ 17,483,615 | \$ 3,174,274 | 76,948 | \$ 835,786 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 180,684 | \$ 31,962 | 910 | \$ 8,416 |
| | Hogs, Pigs, and Other | \$ (12,464) | \$ (2,274) | (64) | \$ (599) |
| | Poultry and Eggs | \$ 3,896,009 | \$ 706,395 | 16,757 | \$ 185,994 |
| | Dairy | \$ 330,955 | \$ 62,972 | 1,681 | \$ 16,581 |
| | Total | \$ 4,395,184 | \$ 799,055 | 19,284 | \$ 210,391 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.1114 | \$ 0.3735 | 10.6 | |
| | Hogs, Pigs, and Other | \$ 1.8604 | \$ 0.3395 | 9.6 | |
| | Poultry and Eggs | \$ 2.7687 | \$ 0.5020 | 11.9 | |
| | Dairy | \$ 2.2599 | \$ 0.4300 | 11.5 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 6.0% |
| | Total | | | | 26.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: HAWAII

Hawaii Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Hawaii's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Hawaii. The success of Hawaii's animal agriculture in turn has a small impact on the rest of the state and regional economies. For example, in the state of Hawaii during 2014 animal agriculture contributed:

- \$258.0 million in economic output
- 1,614 jobs
- \$43.5 million in earnings
- \$12.4 million in income taxes paid at local, state, and federal levels
- \$11.6 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Hawaii increased economic output by over \$107.7 million, boosted household earnings by \$18.0 million, contributed 622 additional jobs and paid \$5.1 million in additional tax revenues.

Hawaii's animal agriculture consumed about 4,600 tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Aquaculture (1,400 tons)
- Hogs (1,100 tons)
- Companion Animals (1,000 tons)

This report examines animal agriculture in Hawaii over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Hawaii, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of Hawaii.

Hawaii Economic Impact of Animal Agriculture

Animal agriculture is a small part of Hawaii's economy. In 2014, Hawaii's animal agriculture contributed the following to the economy:

- About \$258.0 million in economic output
- \$43.5 million in household earnings
- 1,614 jobs
- \$12.4 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade Hawaii's animal agriculture has:

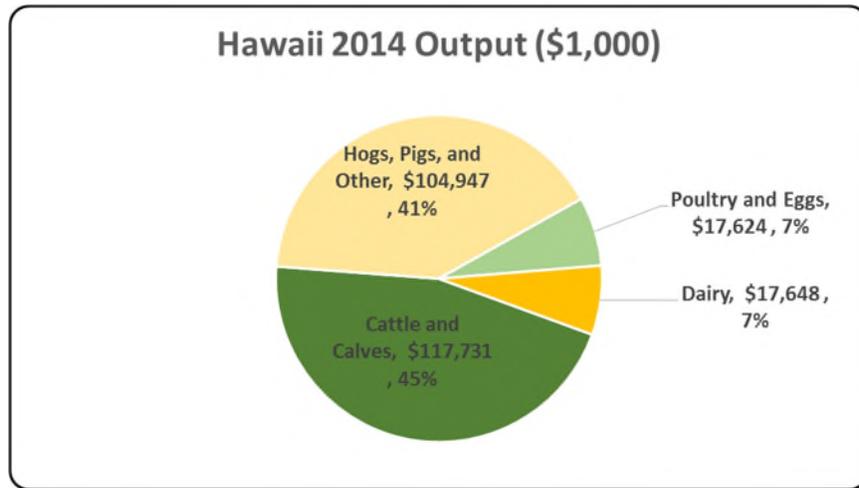
- Increased economic output by \$107.7 million
- Boosted household earnings by \$18.0 million
- Added 622 jobs
- Paid an additional \$5.1 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|------------|------------------|--------------------|
| Output (\$1,000) | \$ 257,951 | \$ 107,671 | 71.65% |
| Earnings (\$1,000) | \$ 43,536 | \$ 17,966 | 70.26% |
| Employment (Jobs) | 1,614 | 622 | 62.69% |
| Income Taxes Paid (\$1,000) | \$ 12,442 | \$ 5,135 | 70.26% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 11,633 | | |

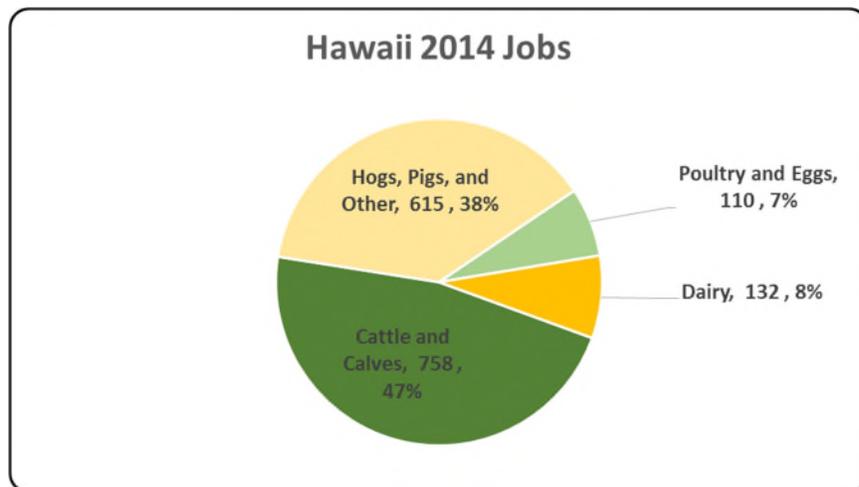
Hawaii Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Hawaii economy. Animal agriculture’s impact on Hawaii total economic output is about \$258.0 million.



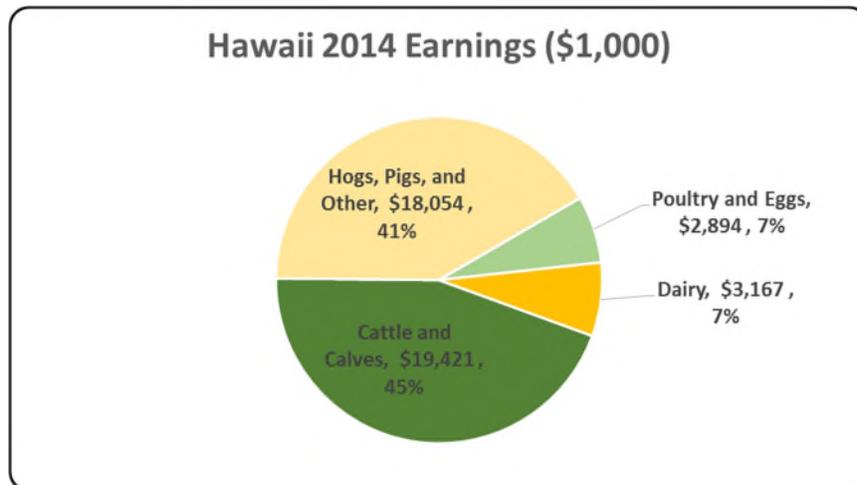
Hawaii Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Hawaii in terms of animal agriculture jobs. As shown, animal agriculture contributes about 1,614 jobs within and outside of animal agriculture.



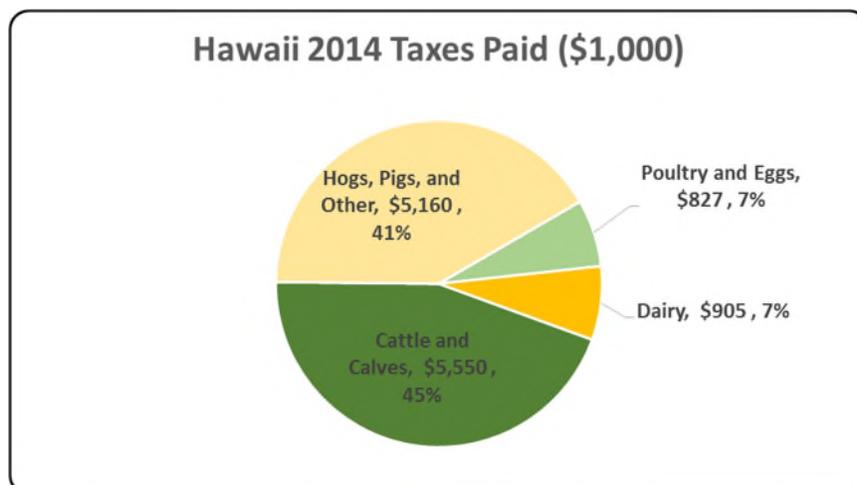
Hawaii Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Hawaii economy in terms of earnings. Hawaii’s animal agriculture contributed about \$43.5 million to household earnings in 2014.



Hawaii Taxes Paid by Animal Agriculture

Hawaii’s animal agriculture is also a source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$12.4 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$11.6 million in property taxes paid by all of Hawaii agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



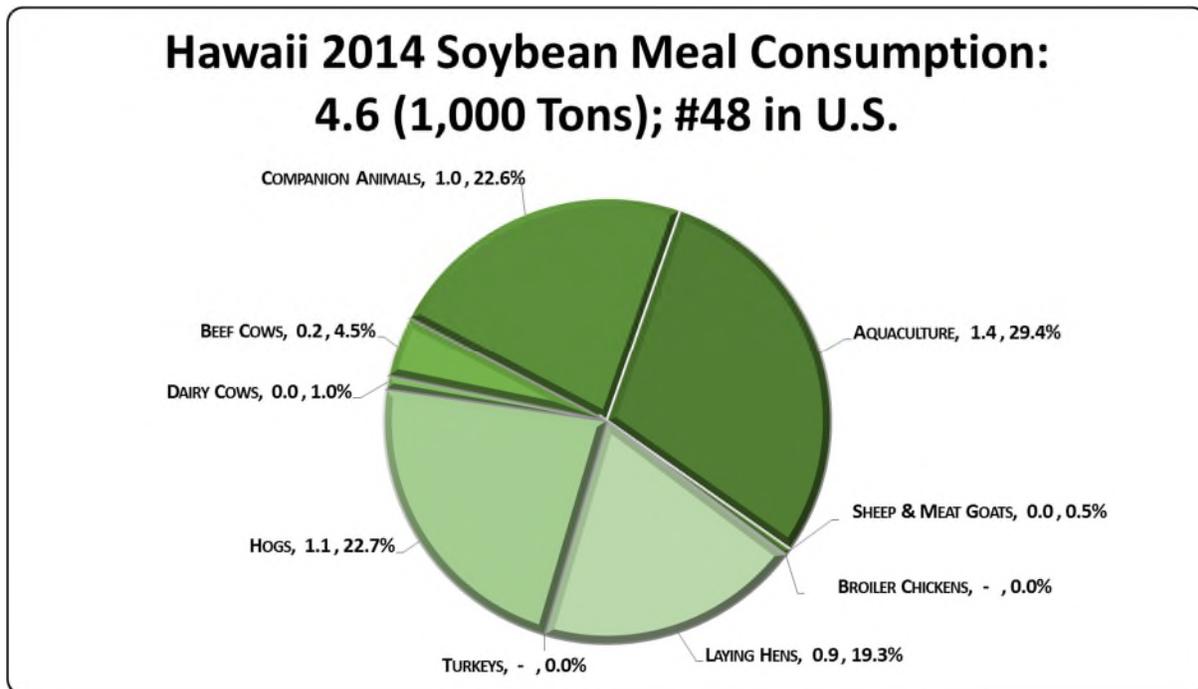
Hawaii Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Hawaii's animal agriculture consumed almost 4,600 tons of soybean meal in 2014, placing the state as #48 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Aquaculture (1,400 tons)
- Hogs (1,100 tons)
- Companion Animals (1,000 tons)

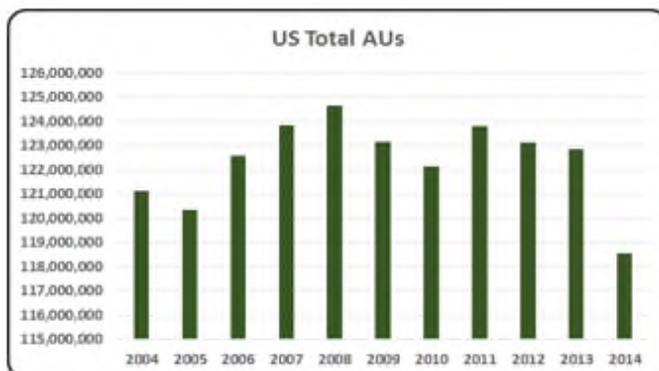


Hawaii Animal Unit (AU) Trends

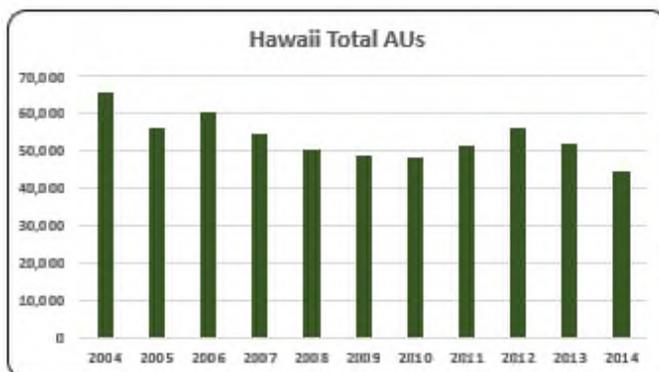
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Hawaii. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Hawaii and to give perspective on Hawaii's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

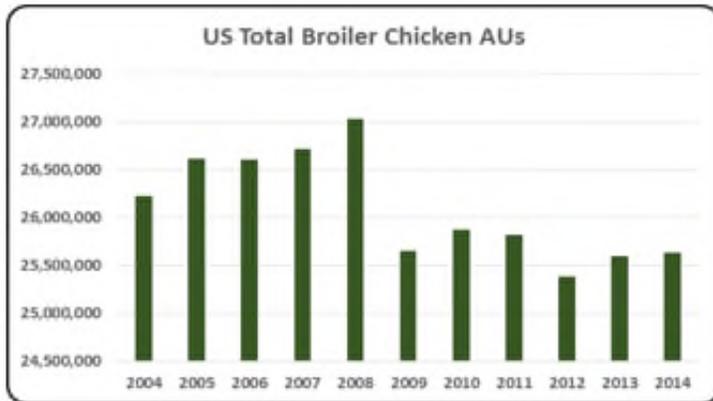
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Hawaii, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (34.1 thousand AUs), Broilers (4.0 thousand AUs), and Dairy Cows (3.1 thousand AUs). Total animal units in Hawaii during 2014 were 44.4 thousand AUs.



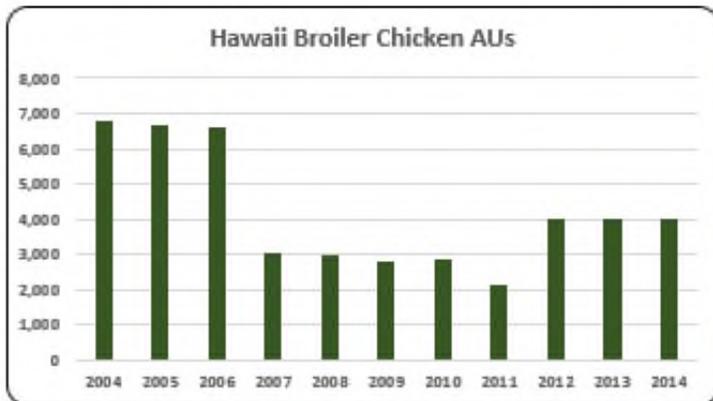
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



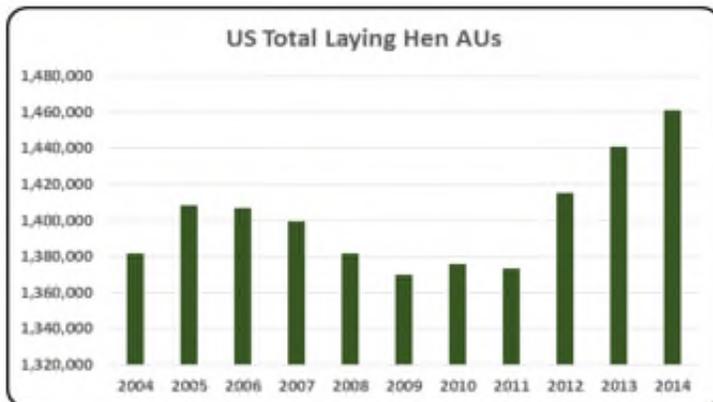
- Overall AUs in Hawaii were small for all species included in this study from 2004 to 2014 and there was a downward tendency during this period for all AUs. Hawaii AUs in 2014 represented 0.04% of the U.S. total.



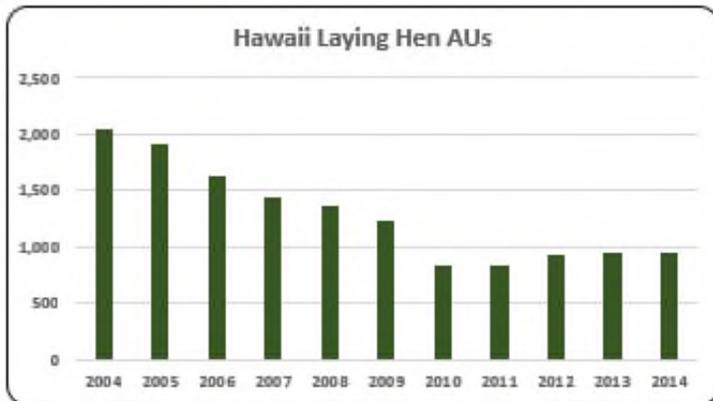
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



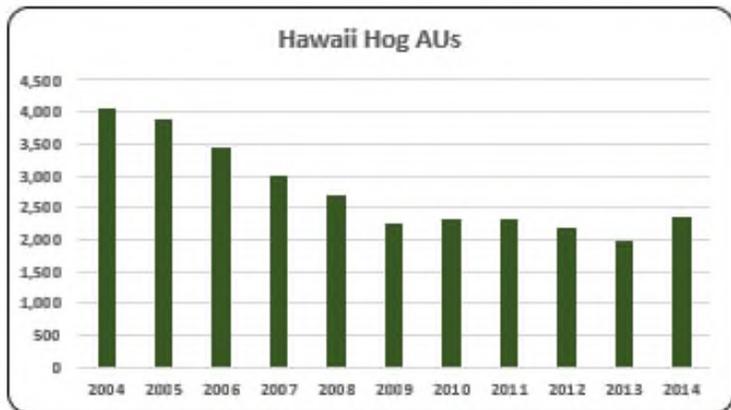
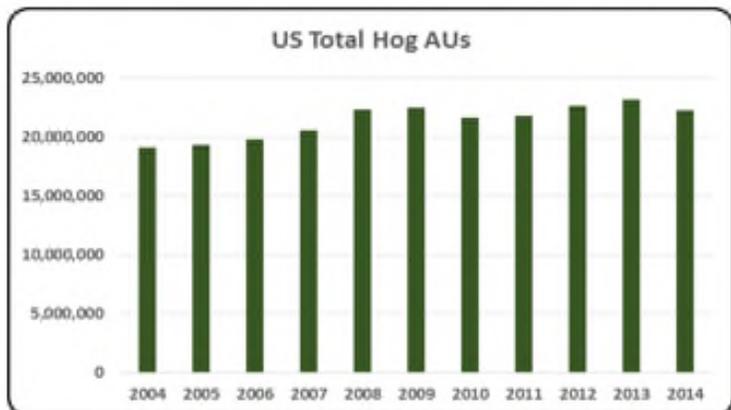
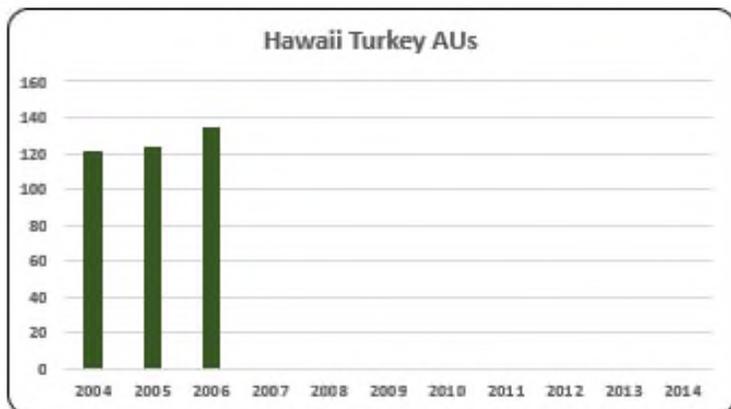
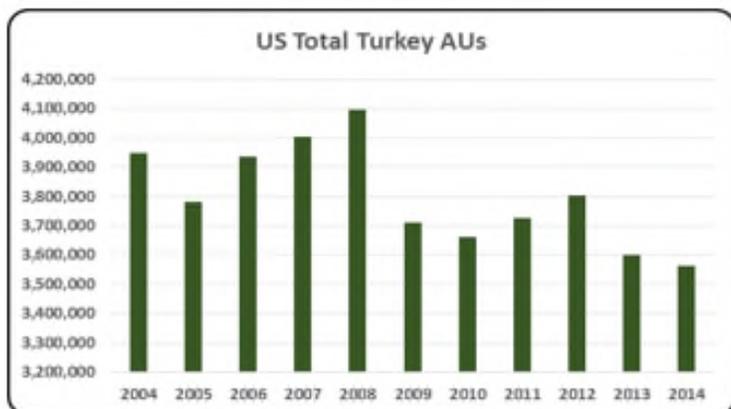
- There were 3,977 broiler AUs in 2014 in Hawaii. Broiler production was the second largest animal production in the state from 2004 to 2014.



- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



- Layer AUs in Hawaii followed a descending trend from the highest numbers in 2004 (2,048) to the lowest numbers in 2010 (832). Layer AUs have raised since the 2010 levels; however, layer AUs in 2014 were 53% below the numbers in 2004.

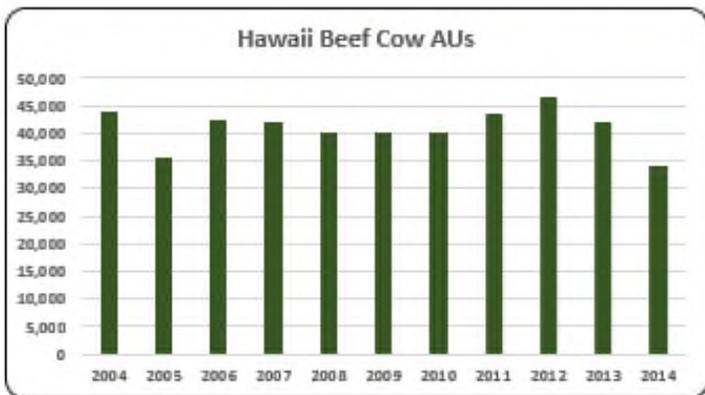
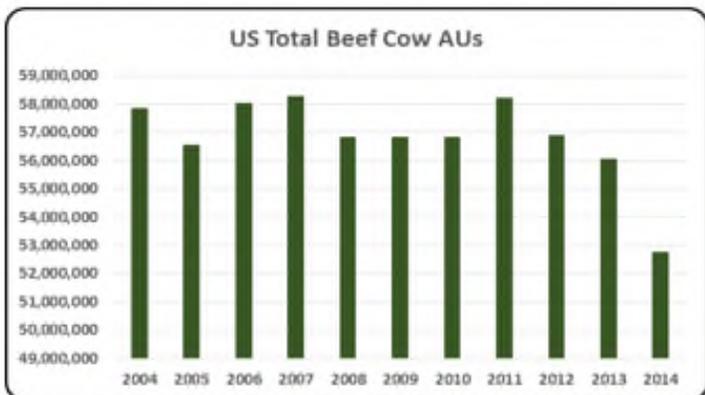
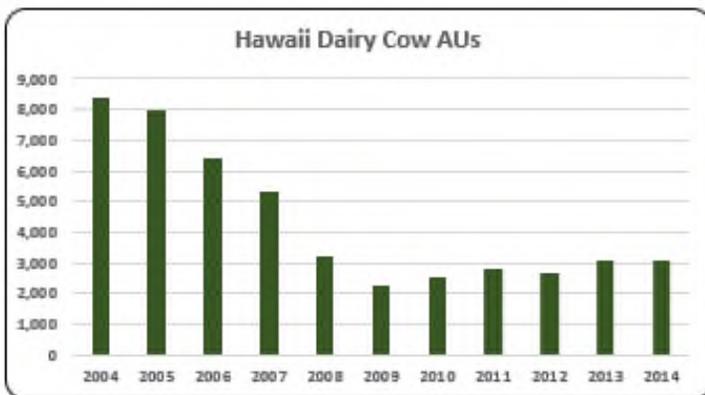
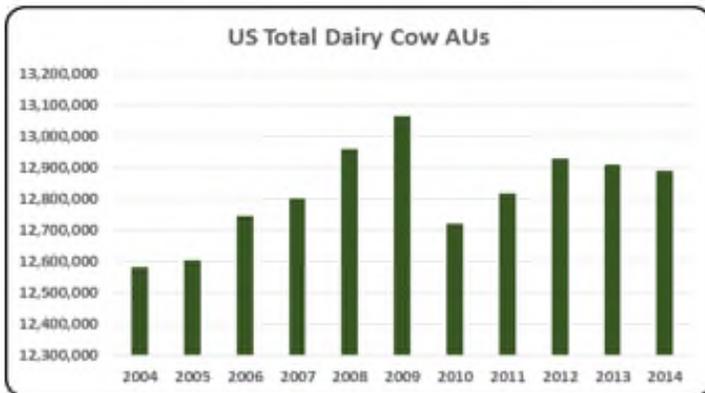


- From 2004 to 2014, the U.S. accounted for 50% of the world's turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

- Turkey production in Hawaii has practically disappeared since 2006.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

- 2014 hog production increased 20.6% to 2,370 compared to the previous year, but overall hog AUs have fallen from a record number in 2004 (4,050) to the lowest number (1,965) in 2013.



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.

- Dairy AUs in Hawaii declined from 2005 reaching the lowest number in 2009 (2,240). Numbers have been rebuilding since then but remained well below dairy cow AUs in 2004 (8,400). In 2014 dairy AUs 3,080.

- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.

- About 77% (34,050) of all AUs in Hawaii were beef cow AUs in 2014. Numbers have varied during the 2004 to 2014 period and consistently declining since the 2012 record number of 46,650 beef cow AUs.

Hawaii Additional Information and Methodology

Animal agriculture is a small part of Hawaii's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Hawaii, of interest is the degree to which the industry impacts the Hawaii economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Hawaii animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Hawaii's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Hawaii which have occurred. As shown in this state report, Hawaii has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Hawaii. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Hawaii Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Hawaii's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Hawaii, \$1.429 to \$1.814 million in total economic activity, \$0.235 to \$0.299 in household wages and 9 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.8144 | \$ 0.2993 | 11.7 |
| | Hogs, Pigs, and Other | \$ 1.5492 | \$ 0.2665 | 9.1 |
| | Poultry and Eggs | \$ 1.4285 | \$ 0.2346 | 9.0 |
| | Dairy | \$ 1.6673 | \$ 0.2992 | 12.4 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| Animal Units (AUs) | Beef Cattle AUs | 44,100 | 35,550 | 42,450 | 42,000 | 40,050 | 40,050 | 40,050 | 43,500 | 46,650 | 42,150 | 34,050 |
| | Hog and Pig AUs | 4,050 | 3,900 | 3,450 | 3,000 | 2,700 | 2,265 | 2,325 | 2,325 | 2,190 | 1,965 | 2,370 |
| | Broiler AUs | 6,794 | 6,651 | 6,606 | 3,049 | 3,001 | 2,791 | 2,828 | 2,131 | 4,013 | 3,999 | 3,977 |
| | Turkey AUs | 121 | 124 | 135 | - | - | - | - | - | - | - | - |
| | Egg Layer AUs | 2,048 | 1,916 | 1,636 | 1,448 | 1,360 | 1,228 | 832 | 837 | 927 | 941 | 956 |
| | Dairy AUs | 8,400 | 7,980 | 6,440 | 5,320 | 3,220 | 2,240 | 2,520 | 2,800 | 2,660 | 3,080 | 3,080 |
| | Total Animal Units | 65,513 | 56,121 | 60,717 | 54,817 | 50,331 | 48,574 | 48,555 | 51,593 | 56,440 | 52,135 | 44,433 |
| | | | | | | | | | | | | |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 23,216 | \$ 25,932 | \$ 26,022 | \$ 24,700 | \$ 24,898 | \$ 29,891 | \$ 28,499 | \$ 46,848 | \$ 49,601 | \$ 48,877 | \$ 64,887 |
| | Hogs and Pigs (\$1,000) | \$ 4,588 | \$ 4,493 | \$ 3,854 | \$ 3,605 | \$ 3,299 | \$ 3,216 | \$ 3,935 | \$ 2,789 | \$ 2,941 | \$ 2,831 | \$ 3,465 |
| | Broilers (\$1,000) | \$ 5,714 | \$ 5,413 | \$ 4,183 | \$ 2,294 | \$ 2,361 | \$ 2,045 | \$ 2,152 | \$ 1,896 | \$ 3,998 | \$ 4,871 | \$ 5,109 |
| | Turkeys (\$1,000) | \$ 112 | \$ 119 | \$ 141 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Eggs (\$1,000) | \$ 10,670 | \$ 8,979 | \$ 8,192 | \$ 7,428 | \$ 8,678 | \$ 8,759 | \$ 8,128 | \$ 4,913 | \$ 5,510 | \$ 6,225 | \$ 7,228 |
| | Milk (\$1,000) | \$ 20,689 | \$ 18,792 | \$ 14,820 | \$ 10,011 | \$ 5,643 | \$ 7,562 | \$ 8,855 | \$ 9,617 | \$ 9,713 | \$ 10,148 | \$ 10,585 |
| | Other | \$ 8,148 | \$ 13,761 | \$ 19,374 | \$ 24,987 | \$ 30,600 | \$ 36,213 | \$ 41,826 | \$ 47,439 | \$ 53,052 | \$ 58,665 | \$ 64,278 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 8,148 | \$ 13,761 | \$ 19,374 | \$ 24,987 | \$ 30,600 | \$ 36,213 | \$ 41,826 | \$ 47,439 | \$ 53,052 | \$ 58,665 | \$ 64,278 |
| | Total (\$1,000) | \$ 73,137 | \$ 77,489 | \$ 76,585 | \$ 73,025 | \$ 75,479 | \$ 87,686 | \$ 93,395 | \$ 113,502 | \$ 124,815 | \$ 131,616 | \$ 155,553 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|---------------|---------------|---------------|----------------|-------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 561 | 526 | 860 | 976 | |
| | Cattle feedlots (112112) | 22 | 30 | 30 | - | |
| | Dairy cattle and milk production (11212) | 14 | 13 | 6 | 9 | |
| | Hog and pig farming (1122) | 152 | 115 | 116 | 91 | |
| | Poultry and egg production (1123) | 39 | 51 | 107 | 97 | |
| | Sheep and goat farming (1124) | 54 | 65 | 190 | 238 | |
| | Animal aquaculture and other animal production (1125,1129) | 149 | 167 | 359 | 257 | |
| Value of Sales (\$1,000) | Cattle and Calves | 27,895 | 30,719 | 44,011 | 37,825 | |
| | Hogs and Pigs | 6,336 | 4,612 | withheld | - | |
| | Poultry and Eggs | 17,999 | 12,545 | withheld | 6,429 | |
| | Milk and Other Dairy Products | 29,058 | 21,745 | 7,018 | - | |
| | Aquaculture | n/a | 14,005 | 14,057 | 56,450 | |
| | Other (calculated) | 14,236 | 4,441 | 18,625 | 8,119 | |
| | Total | 95,524 | 88,067 | 83,711 | 108,823 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 479 | 329 | 547 | 741 | |
| | | \$1,000 | 6,471 | 6,025 | 3,343 | 3,880 |
| | Breeding livestock purchased | (Farms) n/a | 179 | 267 | 354 | |
| | | \$1,000 | n/a | 873 | 1,135 | 1,509 |
| | Other livestock and poultry purchased | (Farms) n/a | 193 | 345 | 491 | |
| | | \$1,000 | n/a | 5,152 | 2,208 | 2,371 |
| Feed purchased | (Farms) 845 | 1,267 | 1,939 | 2,028 | | |
| | \$1,000 | 35,749 | 27,997 | 24,678 | 43,811 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 117,731 | \$ 19,421 | 758 | \$ 5,550 |
| | Hogs, Pigs, and Other | \$ 104,947 | \$ 18,054 | 615 | \$ 5,160 |
| | Poultry and Eggs | \$ 17,624 | \$ 2,894 | 110 | \$ 827 |
| | Dairy | \$ 17,648 | \$ 3,167 | 132 | \$ 905 |
| | Total | \$ 257,951 | \$ 43,536 | 1,614 | \$ 12,442 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 64,941 | \$ 10,713 | 418 | \$ 3,062 |
| | Hogs, Pigs, and Other | \$ 80,220 | \$ 13,800 | 470 | \$ 3,944 |
| | Poultry and Eggs | \$ (11,908) | \$ (1,956) | (75) | \$ (559) |
| | Dairy | \$ (25,582) | \$ (4,591) | (191) | \$ (1,312) |
| | Total | \$ 107,671 | \$ 17,966 | 622 | \$ 5,135 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 1.8144 | \$ 0.2993 | 11.7 | |
| | Hogs, Pigs, and Other | \$ 1.5492 | \$ 0.2665 | 9.1 | |
| | Poultry and Eggs | \$ 1.4285 | \$ 0.2346 | 9.0 | |
| | Dairy | \$ 1.6673 | \$ 0.2992 | 12.4 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 8.3% | |
| | Total | | | 28.6% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: IDAHO

Idaho Executive Summary

The use of soybean meal as a key feed ingredient is a moderate part of Idaho's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture success in Idaho. The success of Idaho animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Idaho during 2014 animal agriculture contributed:

- \$11.8 billion in economic output
- 59,108 jobs
- \$2.0 billion in earnings
- \$563.0 million in income taxes paid at local, state, and federal levels
- \$78.9 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Idaho increased economic output by over \$5 billion, boosted household earnings by \$864.0 million, contributed 25,132 additional jobs and paid \$239.6 million in additional tax revenues.

Idaho's animal agriculture consumed about 108.4 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (73.1 thousand tons)
- Beef Cows (10.4 thousand tons)
- Turkeys (7.0 thousand tons)

This report examines animal agriculture in Idaho over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Idaho, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Idaho and beyond.

Idaho Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Idaho's economy. In 2014, Idaho's animal agriculture contributed the following to the economy:

- About \$11.8 billion in economic output
- \$2.0 billion in household earnings
- 59,108 jobs
- \$563.0 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Idaho's animal agriculture has:

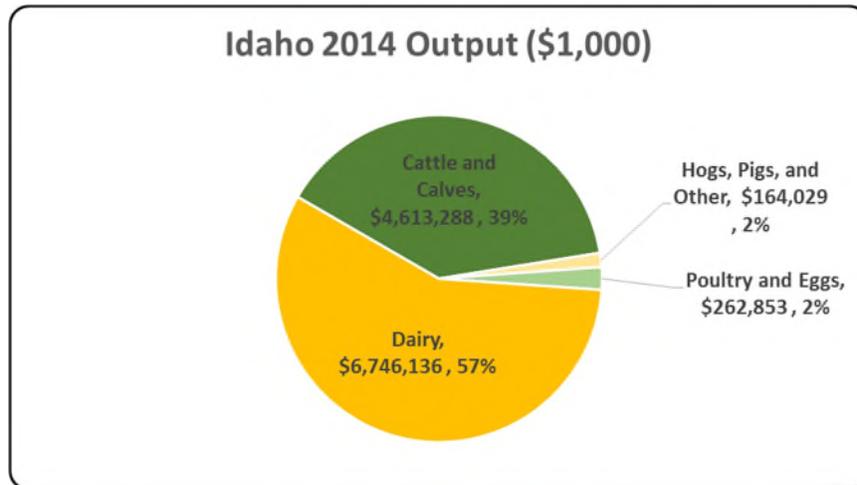
- Increased economic output by \$5.0 billion
- Boosted household earnings by \$864.0 million
- Added 25,132 jobs
- Paid an additional \$239.6 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 11,786,306 | \$ 4,996,955 | 73.60% |
| Earnings (\$1,000) | \$ 2,030,434 | \$ 863,954 | 74.07% |
| Employment (Jobs) | 59,108 | 25,132 | 73.97% |
| Income Taxes Paid (\$1,000) | \$ 563,039 | \$ 239,574 | 74.07% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 78,925 | | |

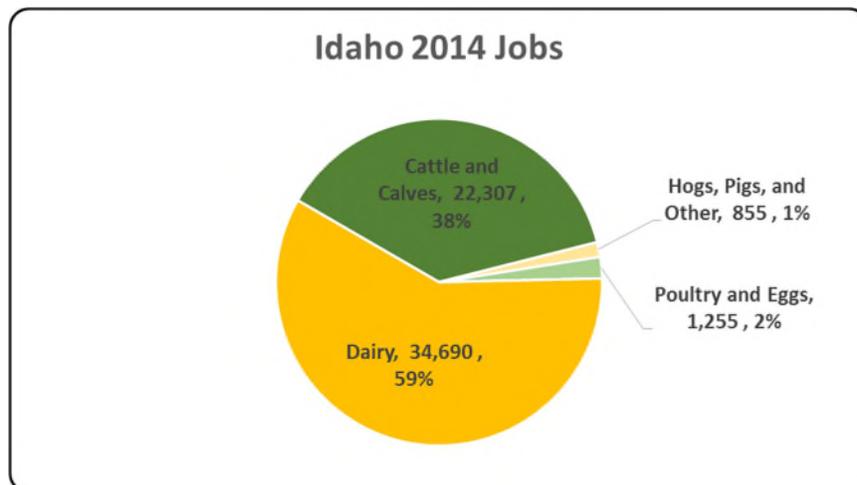
Idaho Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Idaho economy. Animal agriculture’s impact on Idaho total economic output is about \$11.8 billion.



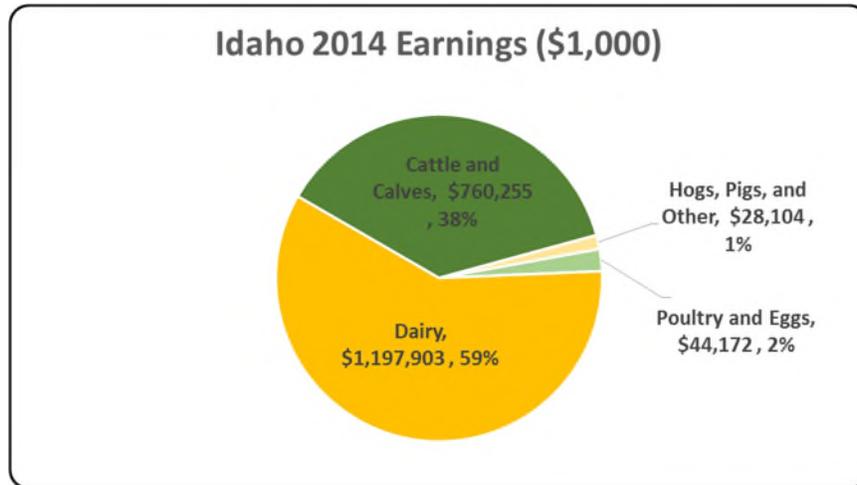
Idaho Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Idaho in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Idaho total jobs, contributing 59,108 jobs within and outside of animal agriculture.



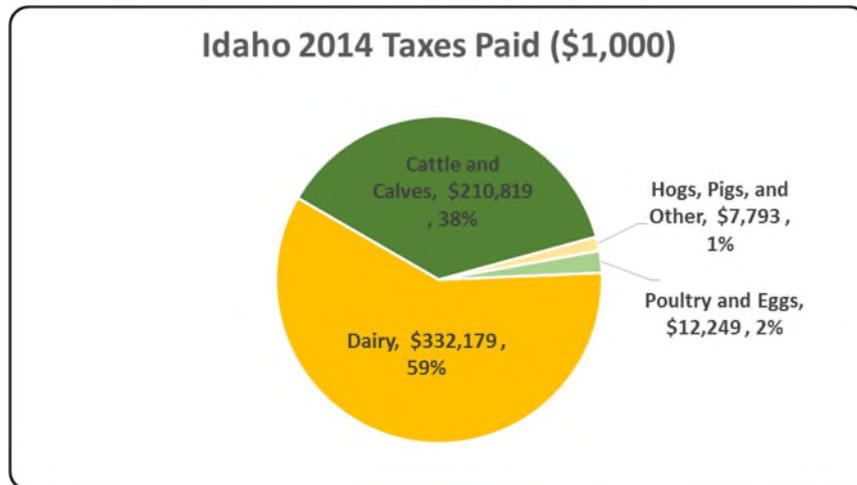
Idaho Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Idaho economy in terms of earnings. Idaho’s animal agriculture contributed about \$2.0 billion to household earnings in 2014.



Idaho Taxes Paid by Animal Agriculture

Idaho’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$563.0 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$78.9 million in property taxes paid by all of Idaho agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



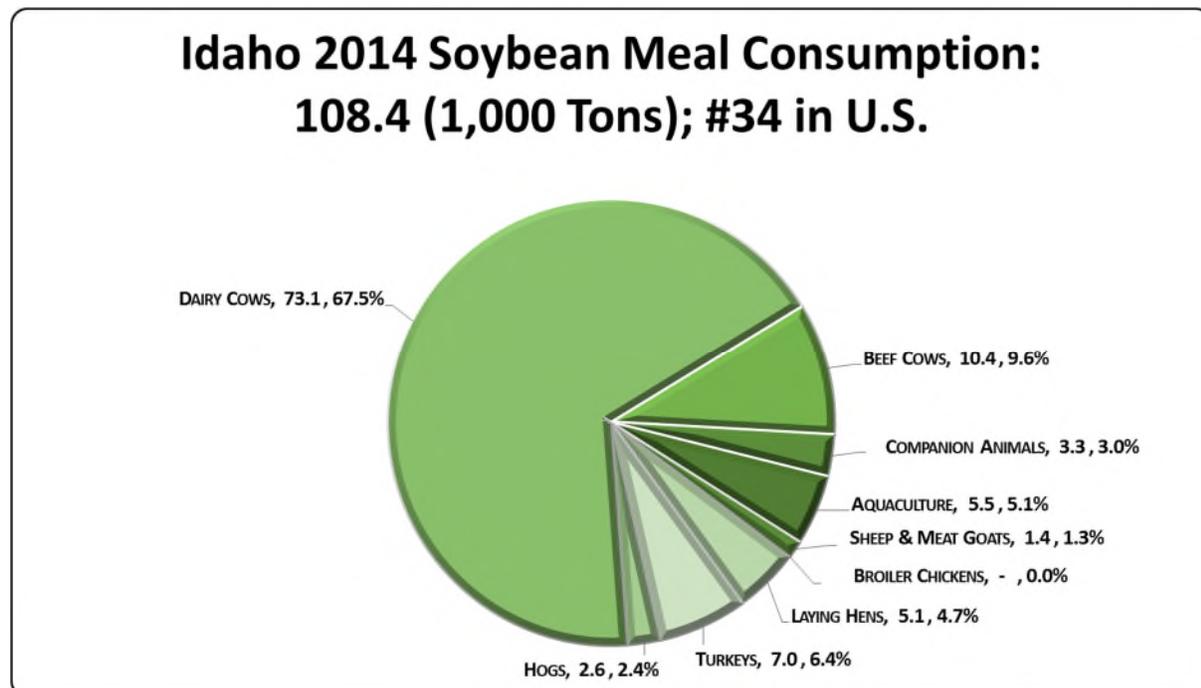
Idaho Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Idaho's animal agriculture consumed almost 108.4 thousand tons of soybean meal in 2014, placing the state as #34 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (73.1 thousand tons)
- Beef Cows (10.4 thousand tons)
- Turkeys (7.0 thousand tons)

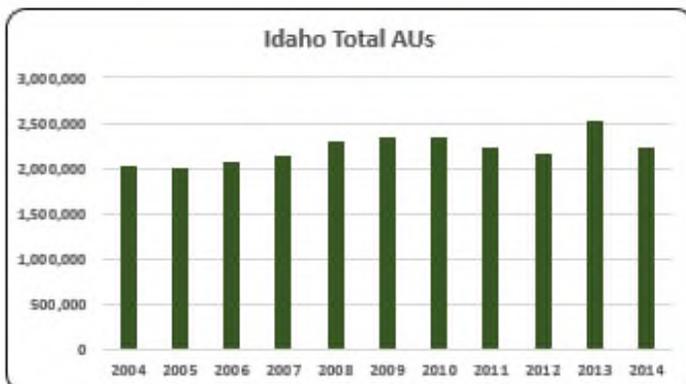
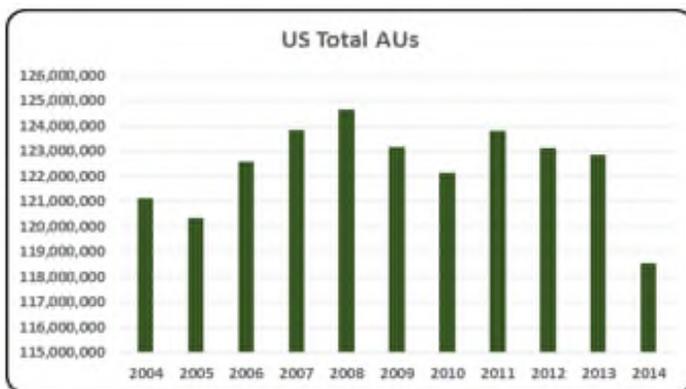


Idaho Animal Unit (AU) Trends

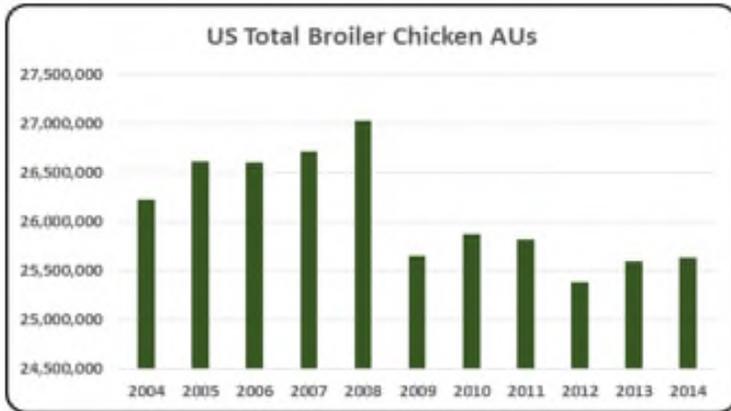
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Idaho. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Idaho and to give perspective on Idaho’s contribution to the nation’s animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

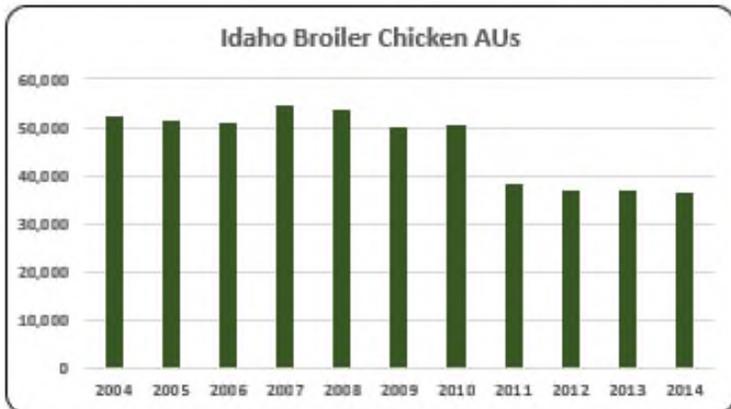
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Idaho, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (1,370.4 thousand AUs), Dairy Cows (791.0 thousand AUs), and Broilers (36.5 thousand AUs). Total animal units in Idaho during 2014 were 2,230.5 thousand AUs.



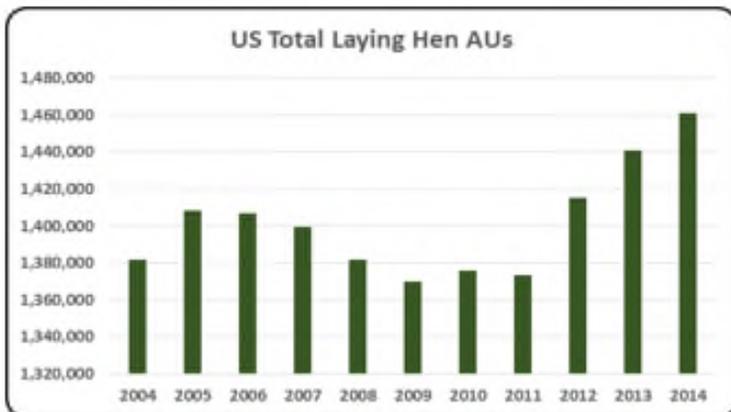
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- There were 2,230.5 thousand AUs in Idaho in 2014 representing 1.88%. Beef cow production is the largest animal production in Idaho with 61.44% of all AUs in the state in 2014.



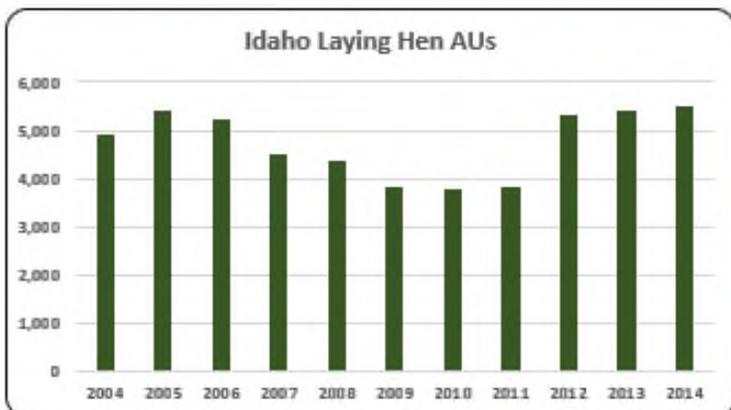
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



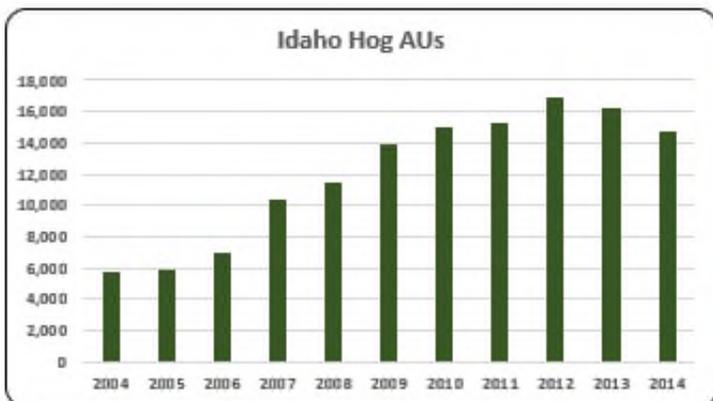
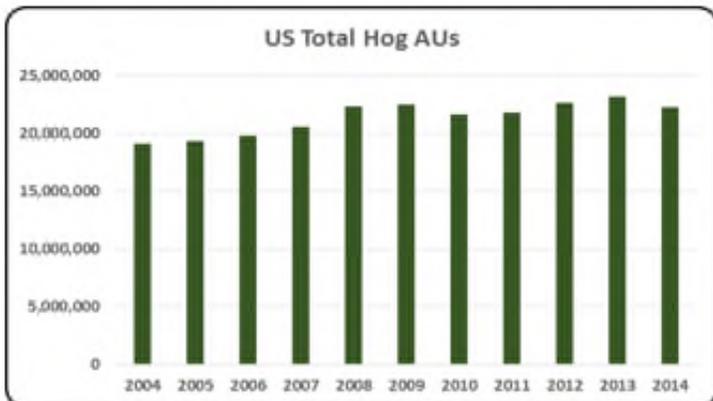
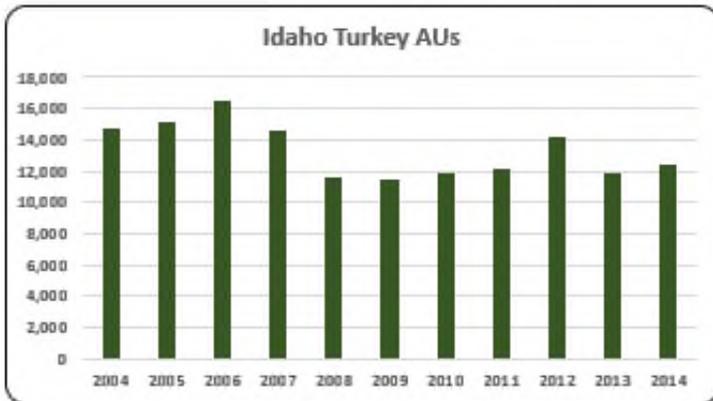
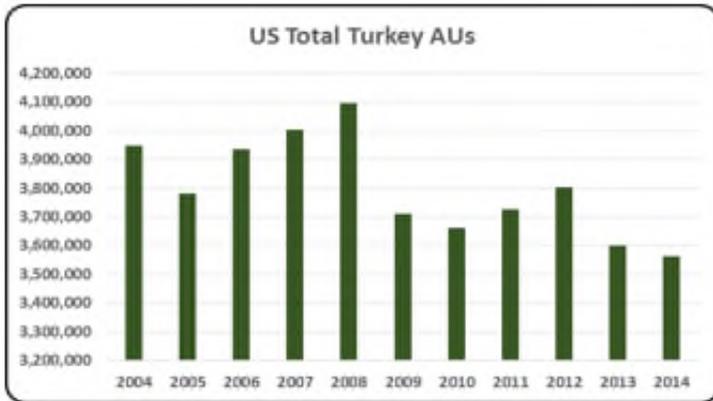
- Over 1.5% (36,513) of all AUs in Idaho were in the broiler industry. In general, broiler production in Idaho has declined over this time frame.



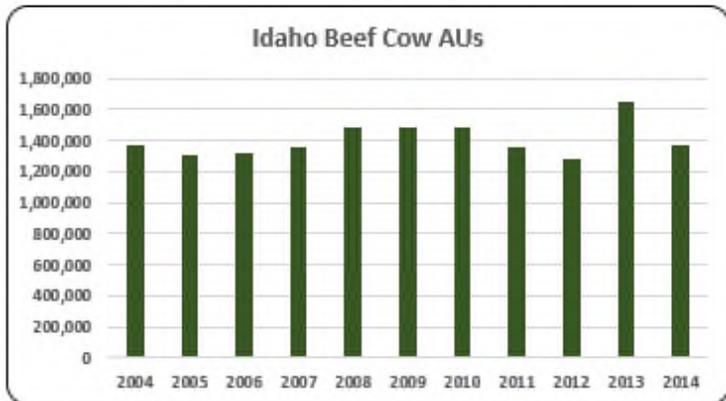
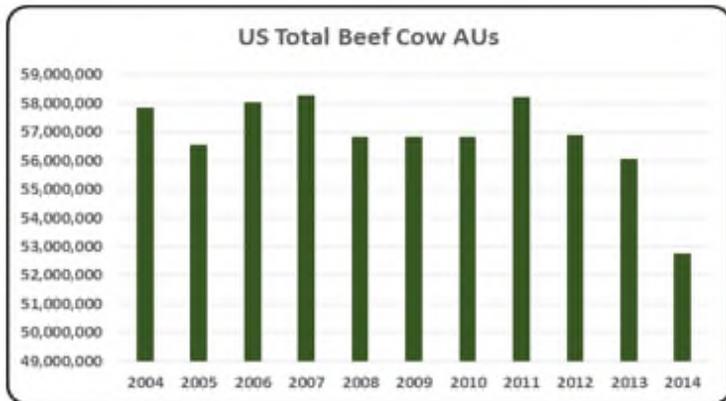
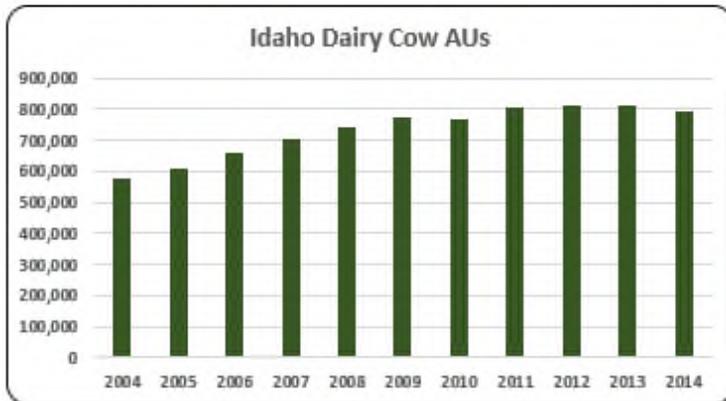
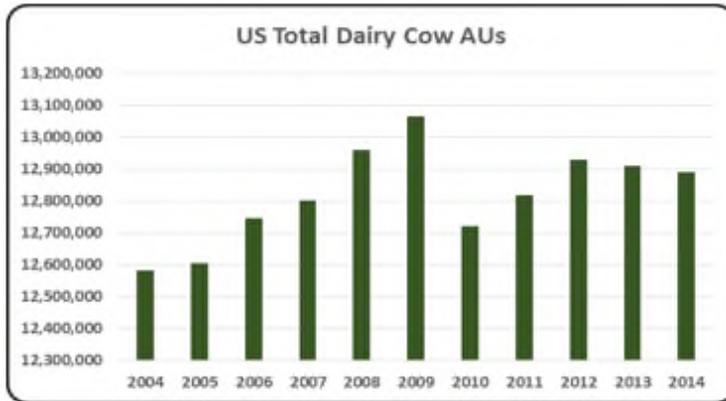
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



- Layer production in Idaho is the smallest of all animal production in the state representing 0.25% (5,494) of all AUs.



- From 2004 to 2014, the U.S. accounted for 50% of the world's turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Less than 1% (12,371) of all AUs in Idaho were turkey AUs in 2014. Turkey AUs rose 4.4% year-over-year but was 13% below the turkey AUs in 2012.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hogs AUs decreased 9.5% to 14,697 in 2014. However, hog numbers have been increasing since 2004. Hog AUs in 2014 represented only 0.66% of all AUs in Idaho.



- From 2004 to 2014 dairy cow AUs averaged 12.8

million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.

- In 2014 35.5% of all AUs of the state were dairy cow AUs. In 2014 dairy cow AUs decreased 2.6% to 791,000, but overall the trend in the dairy cow industry has been positive. In 2014, 6.14% of all dairy cow AUs in the U.S. were in Idaho.
- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.
- There were 1,370.4 thousand beef cow AUs in Idaho in 2014 representing 61.44%. Beef cow AUs in 2014 were 16.6% below the record numbers the previous year (1,642.5 thousand).

Idaho Additional Information and Methodology

Animal agriculture is an important part of Idaho's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Idaho, of interest is the degree to which the industry impacts the Idaho economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Idaho animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Idaho's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Idaho which have occurred. As shown in this state report, Idaho has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Idaho. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Idaho Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Idaho's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Idaho, \$1.888 to \$2.665 million in total economic activity, \$0.324 to \$0.439 in household wages and 10 to 13 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.6651 | \$ 0.4392 | 12.9 |
| | Hogs, Pigs, and Other | \$ 1.8881 | \$ 0.3235 | 9.8 |
| | Poultry and Eggs | \$ 2.3648 | \$ 0.3974 | 11.3 |
| | Dairy | \$ 2.1051 | \$ 0.3738 | 10.8 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,370,550 | 1,309,350 | 1,317,000 | 1,353,000 | 1,483,500 | 1,483,500 | 1,483,500 | 1,355,100 | 1,279,050 | 1,642,500 | 1,370,400 |
| | Hog and Pig AUs | 5,700 | 5,880 | 6,915 | 10,335 | 11,430 | 13,935 | 14,949 | 15,245 | 16,888 | 16,241 | 14,697 |
| | Broiler AUs | 52,352 | 51,250 | 50,904 | 54,445 | 53,596 | 49,832 | 50,502 | 38,054 | 36,850 | 36,721 | 36,513 |
| | Turkey AUs | 14,750 | 15,128 | 16,438 | 14,570 | 11,646 | 11,408 | 11,882 | 12,094 | 14,200 | 11,846 | 12,371 |
| | Egg Layer AUs | 4,914 | 5,412 | 5,222 | 4,483 | 4,355 | 3,809 | 3,784 | 3,806 | 5,325 | 5,408 | 5,494 |
| | Dairy AUs | 576,800 | 609,000 | 662,200 | 702,800 | 742,000 | 775,600 | 770,000 | 803,600 | 813,400 | 812,000 | 791,000 |
| | Total Animal Units | 2,025,066 | 1,996,019 | 2,058,679 | 2,139,633 | 2,306,527 | 2,338,083 | 2,334,617 | 2,227,899 | 2,165,713 | 2,524,716 | 2,230,475 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 847,228 | \$ 867,997 | \$ 858,146 | \$ 917,671 | \$ 917,195 | \$ 806,950 | \$ 1,020,475 | \$ 1,113,672 | \$ 1,240,020 | \$ 1,384,324 | \$ 1,731,000 |
| | Hogs and Pigs (\$1,000) | \$ 4,649 | \$ 4,541 | \$ 5,351 | \$ 8,319 | \$ 9,513 | \$ 10,366 | \$ 13,982 | \$ 17,589 | \$ 19,411 | \$ 17,768 | \$ 18,486 |
| | Broilers (\$1,000) | \$ 44,032 | \$ 41,709 | \$ 32,232 | \$ 40,958 | \$ 42,153 | \$ 36,513 | \$ 38,431 | \$ 33,860 | \$ 36,709 | \$ 44,720 | \$ 46,913 |
| | Turkeys (\$1,000) | \$ 13,686 | \$ 14,512 | \$ 17,152 | \$ 16,803 | \$ 15,730 | \$ 10,549 | \$ 14,133 | \$ 15,851 | \$ 20,595 | \$ 13,562 | \$ 22,708 |
| | Eggs (\$1,000) | \$ 14,479 | \$ 11,492 | \$ 10,844 | \$ 13,354 | \$ 32,952 | \$ 23,453 | \$ 25,745 | \$ 28,227 | \$ 31,656 | \$ 35,765 | \$ 41,531 |
| | Milk (\$1,000) | \$ 1,363,950 | \$ 1,422,540 | \$ 1,286,790 | \$ 2,055,722 | \$ 2,105,865 | \$ 1,433,700 | \$ 1,903,177 | \$ 2,438,184 | \$ 2,426,882 | \$ 2,578,752 | \$ 3,204,663 |
| | Other | \$ 57,600 | \$ 58,179 | \$ 54,510 | \$ 57,164 | \$ 58,830 | \$ 59,418 | \$ 67,764 | \$ 64,394 | \$ 65,725 | \$ 67,057 | \$ 68,389 |
| | Sheep and Lambs (\$1,000) | \$ 21,148 | \$ 20,494 | \$ 15,592 | \$ 17,012 | \$ 17,445 | \$ 16,800 | \$ 23,913 | \$ 19,309 | \$ 19,408 | \$ 19,506 | \$ 19,605 |
| | Aquaculture (\$1,000) | \$ 36,452 | \$ 37,685 | \$ 38,918 | \$ 40,152 | \$ 41,385 | \$ 42,618 | \$ 43,851 | \$ 45,085 | \$ 46,318 | \$ 47,551 | \$ 48,784 |
| | Total (\$1,000) | \$ 2,345,624 | \$ 2,420,971 | \$ 2,265,025 | \$ 3,109,991 | \$ 3,182,237 | \$ 2,380,949 | \$ 3,083,707 | \$ 3,711,777 | \$ 3,840,998 | \$ 4,141,949 | \$ 5,133,690 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 7,697 | 7,027 | 7,712 | 7,505 | |
| | Cattle feedlots (112112) | 443 | 686 | 517 | 150 | |
| | Dairy cattle and milk production (11212) | 926 | 748 | 677 | 589 | |
| | Hog and pig farming (1122) | 180 | 340 | 250 | 217 | |
| | Poultry and egg production (1123) | 84 | 143 | 267 | 345 | |
| | Sheep and goat farming (1124) | 465 | 653 | 835 | 815 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,153 | 5,345 | 3,468 | 3,112 | |
| Value of Sales (\$1,000) | Cattle and Calves | 907,428 | 1,149,407 | 1,383,742 | 1,808,929 | |
| | Hogs and Pigs | 5,188 | 3,260 | 6,757 | withheld | |
| | Poultry and Eggs | 15,111 | 12,636 | 12,673 | 49,733 | |
| | Milk and Other Dairy Products | 556,225 | 869,526 | 1,843,788 | 2,333,364 | |
| | Aquaculture | 35,919 | 39,840 | 56,219 | 52,582 | |
| | Other (calculated) | 51,655 | 46,421 | 60,797 | 75,765 | |
| | Total | 1,571,526 | 2,121,090 | 3,363,976 | 4,320,373 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 7,820 | 7,350 | 6,598 | 7,669 | |
| | | \$1,000 | 469,600 | 616,224 | 584,795 | 633,046 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 3,871 | 3,473 | 4,155 | |
| | | \$1,000 | <i>n/a</i> | 93,697 | 128,710 | 102,481 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 4,439 | 4,074 | 4,718 | |
| | | \$1,000 | <i>n/a</i> | 522,527 | 456,085 | 530,564 |
| Feed purchased | (Farms) | 11,438 | 14,692 | 13,075 | 14,615 | |
| | \$1,000 | 450,829 | 646,250 | 1,137,906 | 1,921,092 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 4,613,288 | \$ 760,255 | 22,307 | \$ 210,819 |
| | Hogs, Pigs, and Other | \$ 164,029 | \$ 28,104 | 855 | \$ 7,793 |
| | Poultry and Eggs | \$ 262,853 | \$ 44,172 | 1,255 | \$ 12,249 |
| | Dairy | \$ 6,746,136 | \$ 1,197,903 | 34,690 | \$ 332,179 |
| | Total | \$ 11,786,306 | \$ 2,030,434 | 59,108 | \$ 563,039 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 1,783,551 | \$ 293,923 | 8,624 | \$ 81,505 |
| | Hogs, Pigs, and Other | \$ 16,734 | \$ 2,867 | 87 | \$ 795 |
| | Poultry and Eggs | \$ 48,886 | \$ 8,215 | 233 | \$ 2,278 |
| | Dairy | \$ 3,147,785 | \$ 558,948 | 16,186 | \$ 154,996 |
| | Total | \$ 4,996,955 | \$ 863,954 | 25,132 | \$ 239,574 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.6651 | \$ 0.4392 | 12.9 | |
| | Hogs, Pigs, and Other | \$ 1.8881 | \$ 0.3235 | 9.8 | |
| | Poultry and Eggs | \$ 2.3648 | \$ 0.3974 | 11.3 | |
| | Dairy | \$ 2.1051 | \$ 0.3738 | 10.8 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 7.4% |
| | Total | | | | 27.7% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: ILLINOIS

Illinois Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Illinois's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Illinois. The success of Illinois animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Illinois during 2014 animal agriculture contributed:

- \$6.6 billion in economic output
- 28,184 jobs
- \$1.2 billion in earnings
- \$300.7 million in income taxes paid at local, state, and federal levels
- \$321.3 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Illinois increased economic output by over \$1.4 billion, boosted household earnings by \$255.8 million, contributed 6,059 additional jobs and paid \$64.8 million in additional tax revenues.

Illinois's animal agriculture consumed about 875.7 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (650.2 thousand tons)
- Broilers (72.4 thousand tons)
- Dairy Cows (72.1 thousand tons)

This report examines animal agriculture in Illinois over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Illinois, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a contributor to the economic well-being of the people of Illinois and beyond.

Illinois Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Illinois's economy. In 2014, Illinois's animal agriculture contributed the following to the economy:

- About \$6.6 billion in economic output
- \$1.2 billion in household earnings
- 28,184 jobs
- \$300.7 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Illinois's animal agriculture has:

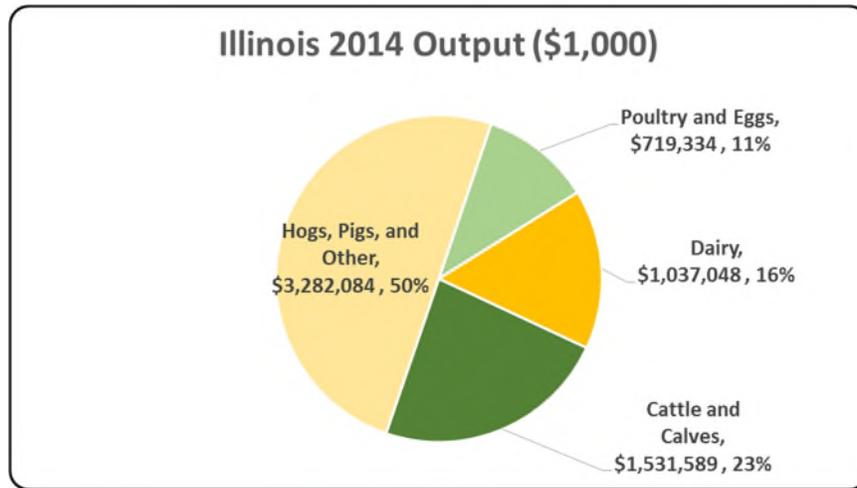
- Increased economic output by \$1.4 billion
- Boosted household earnings by \$255.8 million
- Added 6,059 jobs
- Paid an additional \$64.8 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 6,570,055 | \$ 1,417,101 | 27.50% |
| Earnings (\$1,000) | \$ 1,187,211 | \$ 255,792 | 27.46% |
| Employment (Jobs) | 28,184 | 6,059 | 27.39% |
| Income Taxes Paid (\$1,000) | \$ 300,720 | \$ 64,792 | 27.46% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 321,273 | | |

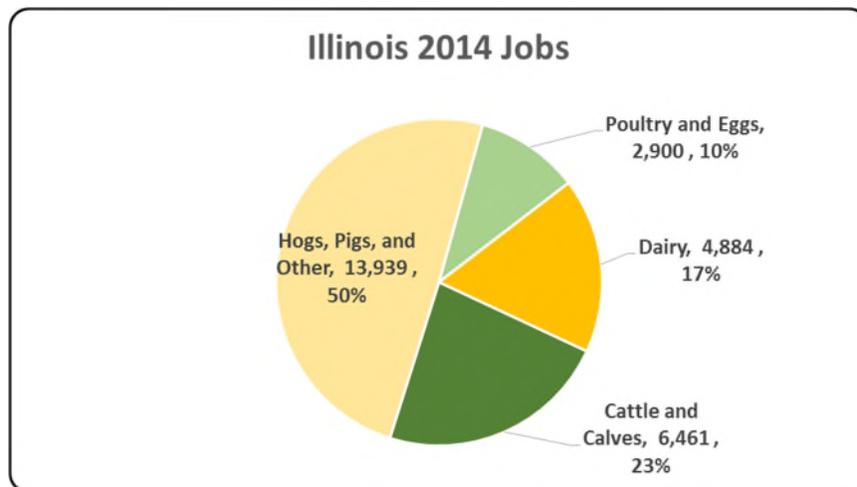
Illinois Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Illinois economy. Animal agriculture’s impact on Illinois total economic output is about \$6.6 billion.



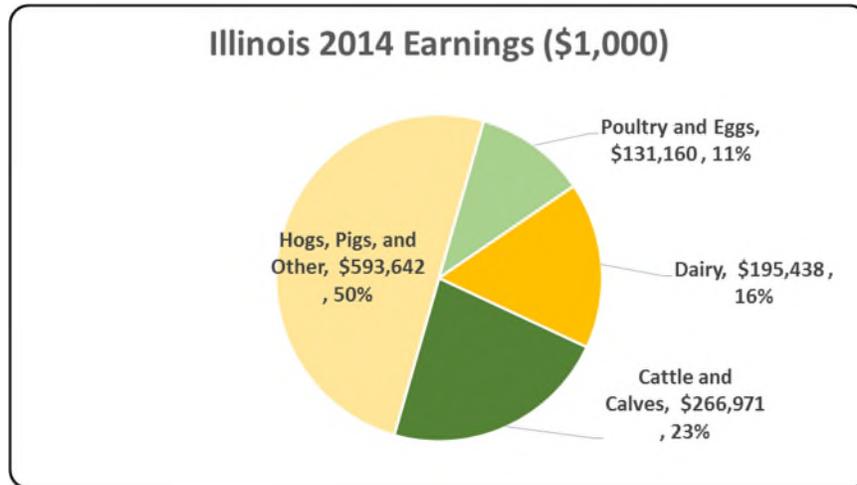
Illinois Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Illinois in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Illinois total jobs, contributing 28,184 jobs within and outside of animal agriculture.



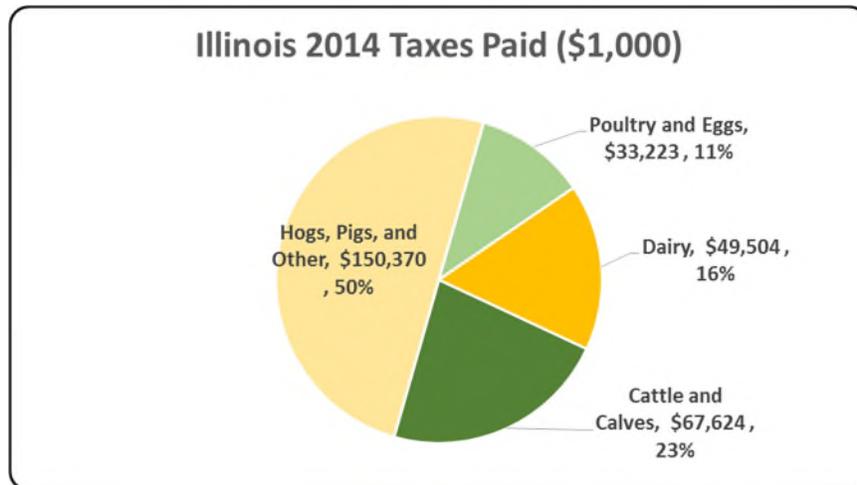
Illinois Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Illinois economy in terms of earnings. Illinois’s animal agriculture contributed about \$1.2 billion to household earnings in 2014.



Illinois Taxes Paid by Animal Agriculture

Illinois’s animal agriculture is also a source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$300.7 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$321.3 million in property taxes paid by all of Illinois agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



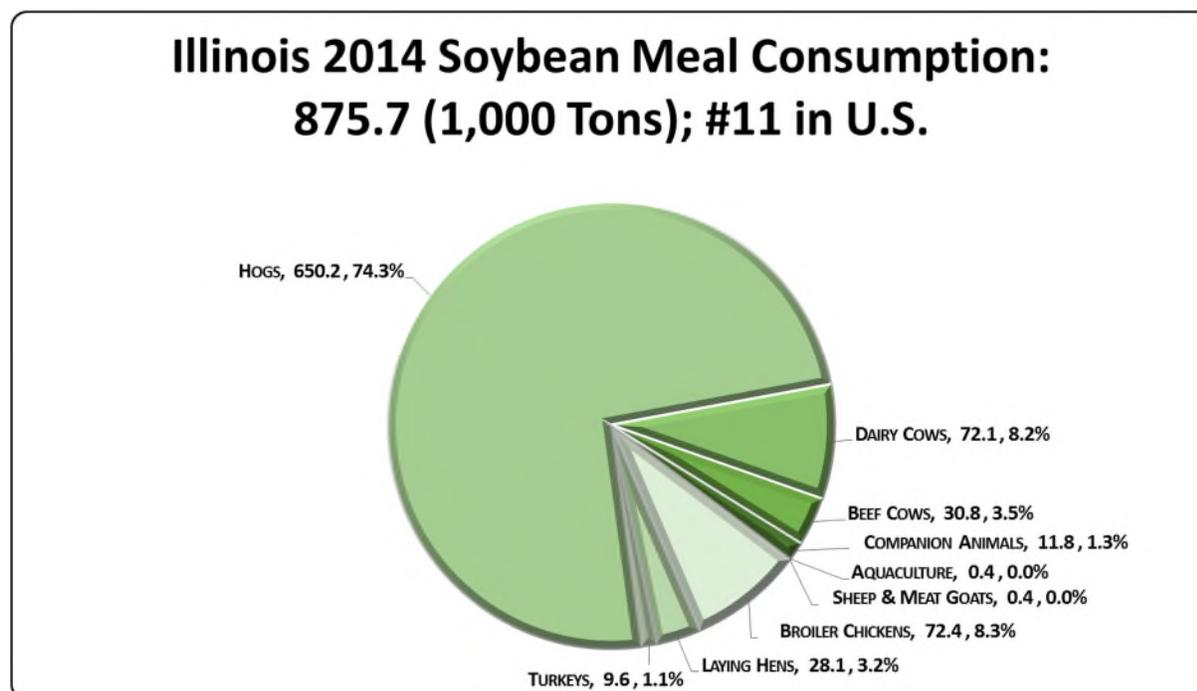
Illinois Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Illinois's animal agriculture consumed almost 875.7 thousand tons of soybean meal in 2014, placing the state as #11 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (650.2 thousand tons)
- Broilers (72.4 thousand tons)
- Dairy Cows (72.1 thousand tons)

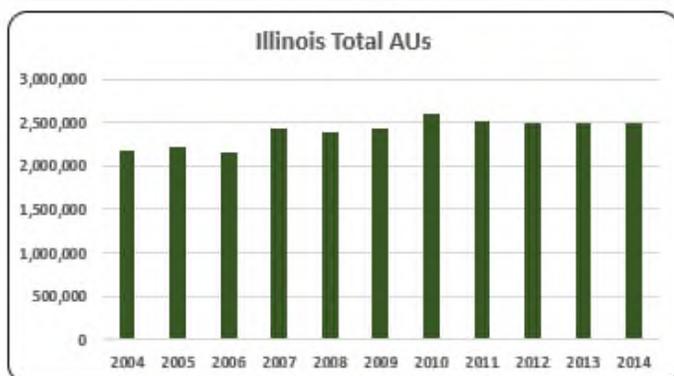
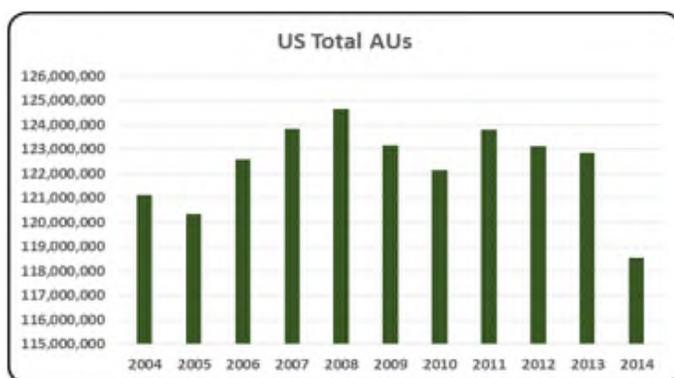


Illinois Animal Unit (AU) Trends

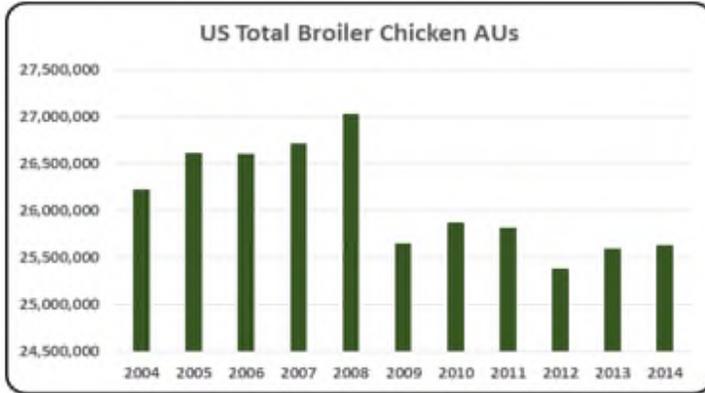
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Illinois. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Illinois and to give perspective on Illinois's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

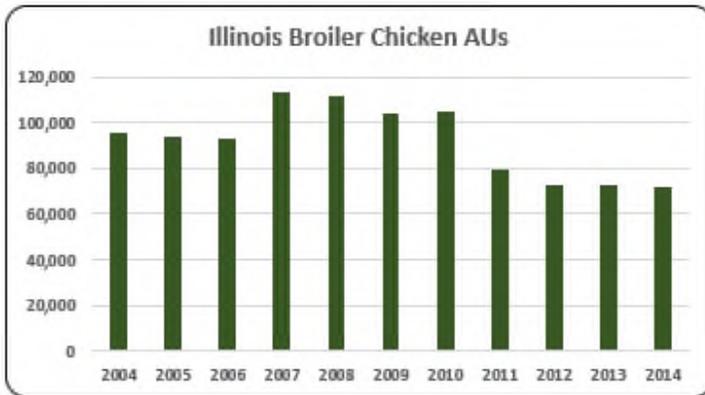
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Illinois, the largest three segments of animal agriculture in terms of AUs during 2014 were: Hogs (1,790.3 thousand AUs), Beef Cows (469.7 thousand AUs), and Dairy Cows (133.0 thousand AUs). Total animal units in Illinois during 2014 were 2,501.7 thousand AUs.



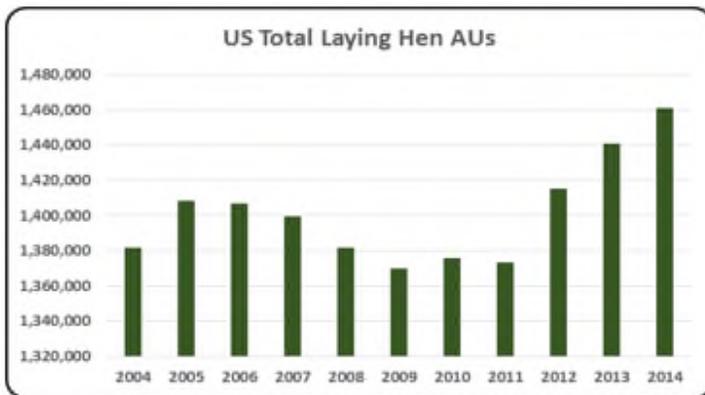
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- The number of AUs in Illinois in 2014 reached 2,501.7 thousand comprising 2.11% of all AUs in the U.S. On average, there were 2,399.7 between 2004 and 2014.



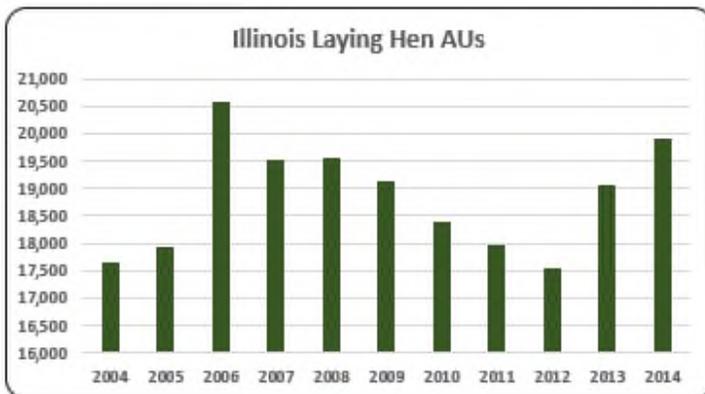
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



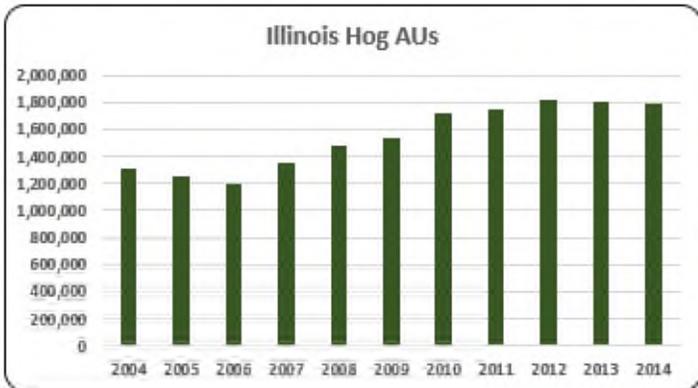
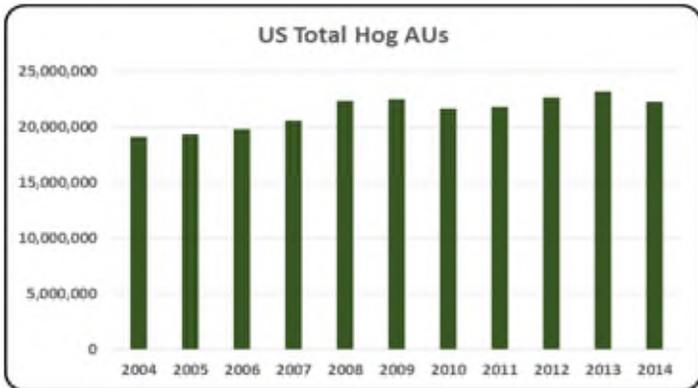
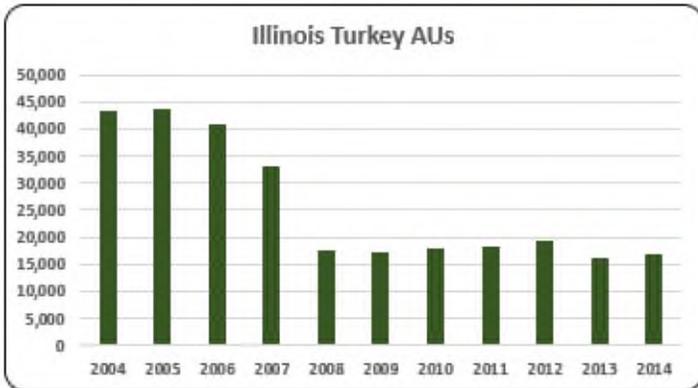
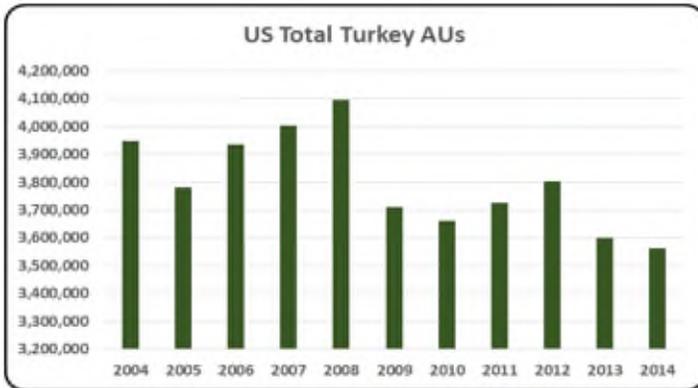
- There were 71,941 broiler AUs in Illinois in 2014 representing about 3% of all AUs in the state of Illinois. Overall numbers have been decreasing since 2010 (105,044).



- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



- There were 19,904 layer AUs in Illinois in 2014 or 0.80% of all AUs in the state. Layer AUs rose 4.5% in 2014 compared to the previous year reaching the second largest turkey AUs during the 2004-2014 period.

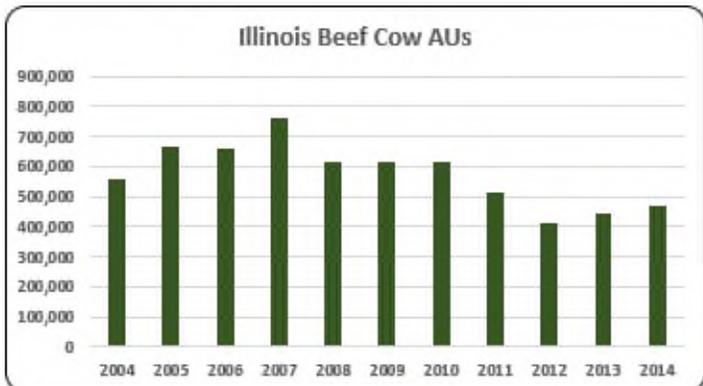
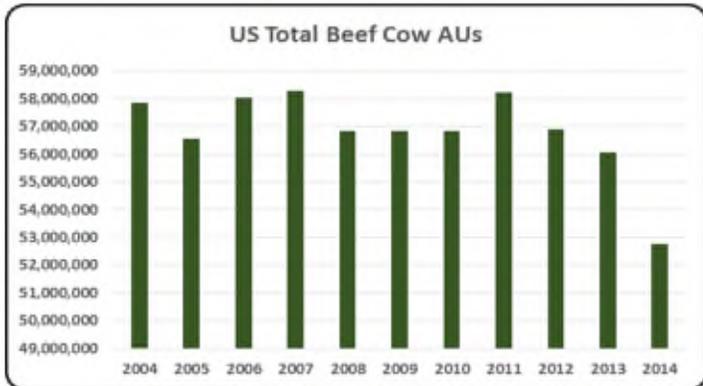
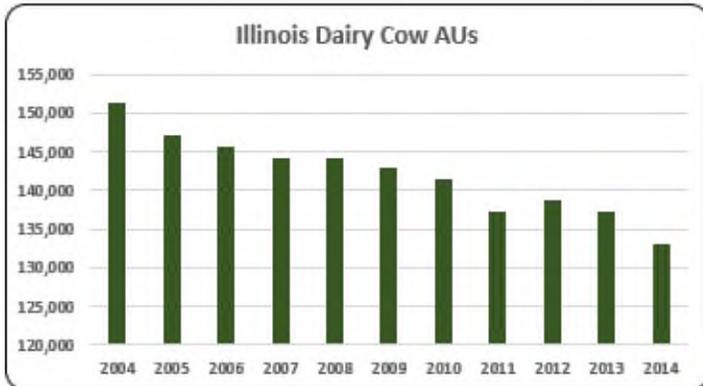
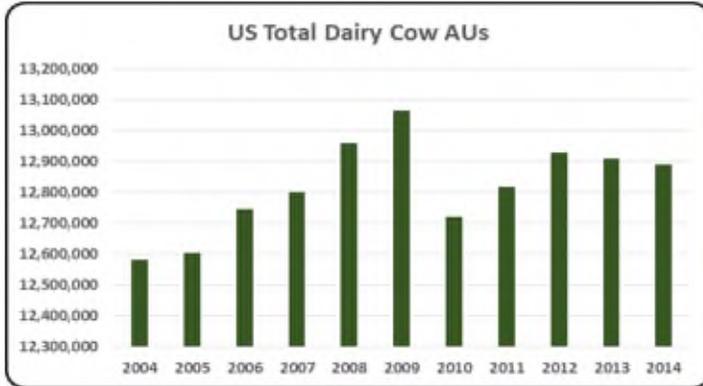


- From 2004 to 2014, the U.S. accounted for 50% of the world's turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

- The turkey industry in Illinois declined from 2006 (40,723 turkey AUs) to 2009 (17,295 turkey AUs). There were 16,999 turkey AUs in 2014.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

- About 72% (1,790.3 thousand) of all AUs in the state of Illinois were hog AUs in 2014 which represented at the same time 8.1% of all hog AUs in the U.S. (22,251.3 thousand). Hog AUs decreased 1.1% relative to the previous year, however, hog production has experienced an upward trend since 2007.



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.

- Illinois had an average of 142,036 dairy cow AUs from 2004 to 2014. Numbers have consistently decreased from 151,200 in 2004 to 133,000 in 2014, which was the lowest during this period.

- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.

- The second largest animal production in Illinois is beef cow production with 469,650 AUs in 2014. Beef cow AUs increased 5.9% year-over-year but overall numbers have been decreasing since 2007 (763,800). In 2014, beef cow AUs represented 0.89% of all beef cow AUs in the U.S.

Illinois Additional Information and Methodology

Animal agriculture is an important part of Illinois's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Illinois, of interest is the degree to which the industry impacts the Illinois economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Illinois animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Illinois's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Illinois which have occurred. As shown in this state report, Illinois has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Illinois. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Illinois Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Illinois's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Illinois, \$2.031 to \$2.902 million in total economic activity, \$0.355 to \$0.529 in household wages and 9 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.0389 | \$ 0.3554 | 8.6 |
| | Hogs, Pigs, and Other | \$ 2.0307 | \$ 0.3673 | 8.6 |
| | Poultry and Eggs | \$ 2.9018 | \$ 0.5291 | 11.7 |
| | Dairy | \$ 2.2695 | \$ 0.4277 | 10.7 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 554,700 | 663,150 | 661,650 | 763,800 | 612,600 | 612,600 | 612,600 | 512,280 | 413,100 | 443,400 | 469,650 |
| | Hog and Pig AUs | 1,312,200 | 1,246,650 | 1,198,050 | 1,357,350 | 1,473,750 | 1,541,100 | 1,713,900 | 1,744,650 | 1,822,500 | 1,810,350 | 1,790,250 |
| | Broiler AUs | 95,512 | 93,501 | 92,870 | 113,246 | 111,480 | 103,650 | 105,044 | 79,152 | 72,605 | 72,351 | 71,941 |
| | Turkey AUs | 43,500 | 43,730 | 40,723 | 33,218 | 17,657 | 17,295 | 18,015 | 18,337 | 19,512 | 16,276 | 16,999 |
| | Egg Layer AUs | 17,668 | 17,944 | 20,584 | 19,504 | 19,564 | 19,128 | 18,400 | 17,952 | 17,547 | 19,046 | 19,904 |
| | Dairy AUs | 151,200 | 147,000 | 145,600 | 144,200 | 144,200 | 142,800 | 141,400 | 137,200 | 138,600 | 137,200 | 133,000 |
| | Total Animal Units | 2,174,780 | 2,211,975 | 2,159,477 | 2,431,318 | 2,379,251 | 2,436,574 | 2,609,359 | 2,509,570 | 2,483,864 | 2,498,623 | 2,501,744 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 489,612 | \$ 522,161 | \$ 527,581 | \$ 587,362 | \$ 500,092 | \$ 421,683 | \$ 489,657 | \$ 521,986 | \$ 539,376 | \$ 570,135 | \$ 751,184 |
| | Hogs and Pigs (\$1,000) | \$ 937,613 | \$ 901,842 | \$ 781,381 | \$ 785,810 | \$ 910,385 | \$ 901,768 | \$ 1,115,896 | \$ 1,322,243 | \$ 1,360,537 | \$ 1,455,041 | \$ 1,610,615 |
| | Broilers (\$1,000) | \$ 80,334 | \$ 76,095 | \$ 58,805 | \$ 85,193 | \$ 87,678 | \$ 75,947 | \$ 79,938 | \$ 70,429 | \$ 72,327 | \$ 88,113 | \$ 92,433 |
| | Turkeys (\$1,000) | \$ 37,514 | \$ 39,904 | \$ 43,416 | \$ 42,997 | \$ 23,848 | \$ 15,994 | \$ 21,427 | \$ 24,032 | \$ 28,298 | \$ 18,635 | \$ 31,201 |
| | Eggs (\$1,000) | \$ 51,478 | \$ 38,058 | \$ 45,876 | \$ 87,034 | \$ 109,290 | \$ 71,103 | \$ 73,893 | \$ 82,016 | \$ 88,598 | \$ 92,194 | \$ 124,258 |
| | Milk (\$1,000) | \$ 310,546 | \$ 297,616 | \$ 279,603 | \$ 377,649 | \$ 371,224 | \$ 247,646 | \$ 314,640 | \$ 380,940 | \$ 362,392 | \$ 378,810 | \$ 456,950 |
| | Other | \$ 6,554 | \$ 7,199 | \$ 5,564 | \$ 5,536 | \$ 5,472 | \$ 6,032 | \$ 6,660 | \$ 5,844 | \$ 5,769 | \$ 5,693 | \$ 5,618 |
| | Sheep and Lambs (\$1,000) | \$ 3,339 | \$ 4,023 | \$ 2,427 | \$ 2,439 | \$ 2,414 | \$ 3,013 | \$ 3,681 | \$ 2,904 | \$ 2,868 | \$ 2,832 | \$ 2,796 |
| | Aquaculture (\$1,000) | \$ 3,215 | \$ 3,176 | \$ 3,137 | \$ 3,097 | \$ 3,058 | \$ 3,019 | \$ 2,979 | \$ 2,940 | \$ 2,900 | \$ 2,861 | \$ 2,822 |
| | Total (\$1,000) | \$ 1,913,651 | \$ 1,882,875 | \$ 1,742,226 | \$ 1,971,581 | \$ 2,007,989 | \$ 1,740,173 | \$ 2,102,111 | \$ 2,407,490 | \$ 2,457,297 | \$ 2,608,621 | \$ 3,072,259 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|------------------|------------------|------------------|------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 7,391 | 6,178 | 7,296 | 6,600 | |
| | Cattle feedlots (112112) | 1,990 | 2,217 | 1,133 | 662 | |
| | Dairy cattle and milk production (11212) | 1,452 | 1,226 | 900 | 742 | |
| | Hog and pig farming (1122) | 3,369 | 1,693 | 1,259 | 871 | |
| | Poultry and egg production (1123) | 301 | 334 | 938 | 603 | |
| | Sheep and goat farming (1124) | 611 | 645 | 1,078 | 1,090 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,567 | 3,295 | 4,186 | 4,150 | |
| Value of Sales (\$1,000) | Cattle and Calves | 584,737 | 624,976 | 808,487 | 984,466 | |
| | Hogs and Pigs | 1,067,018 | 844,360 | 1,105,271 | 1,519,514 | |
| | Poultry and Eggs | 98,025 | 83,807 | 163,507 | 136,876 | |
| | Milk and Other Dairy Products | 252,838 | 226,761 | 340,336 | 347,339 | |
| | Aquaculture | 2,871 | 2,282 | 4,011 | 5,425 | |
| | Other (calculated) | 26,424 | 22,511 | 31,080 | 24,054 | |
| | Total | 2,031,913 | 1,804,697 | 2,452,692 | 3,017,674 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 15,984 | 12,734 | 11,350 | 12,350 |
| | | \$1,000 | 334,161 | 411,546 | 588,949 | 689,855 |
| | Breeding livestock purchased | (Farms) | n/a | 6,918 | 6,443 | 6,746 |
| | | \$1,000 | n/a | 40,328 | 57,009 | 81,200 |
| | Other livestock and poultry purchased | (Farms) | n/a | 7,362 | 6,404 | 7,350 |
| | | \$1,000 | n/a | 371,218 | 531,940 | 608,656 |
| | Feed purchased | (Farms) | 27,101 | 24,652 | 23,374 | 24,338 |
| | | \$1,000 | 567,098 | 528,144 | 705,155 | 1,246,112 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,531,589 | \$ 266,971 | 6,461 | \$ 67,624 |
| | Hogs, Pigs, and Other | \$ 3,282,084 | \$ 593,642 | 13,939 | \$ 150,370 |
| | Poultry and Eggs | \$ 719,334 | \$ 131,160 | 2,900 | \$ 33,223 |
| | Dairy | \$ 1,037,048 | \$ 195,438 | 4,884 | \$ 49,504 |
| | Total | \$ 6,570,055 | \$ 1,187,211 | 28,184 | \$ 300,720 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 280,523 | \$ 48,898 | 1,183 | \$ 12,386 |
| | Hogs, Pigs, and Other | \$ 879,232 | \$ 159,030 | 3,734 | \$ 40,282 |
| | Poultry and Eggs | \$ 103,559 | \$ 18,882 | 418 | \$ 4,783 |
| | Dairy | \$ 153,788 | \$ 28,982 | 724 | \$ 7,341 |
| | Total | \$ 1,417,101 | \$ 255,792 | 6,059 | \$ 64,792 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.0389 | \$ 0.3554 | 8.6 | |
| | Hogs, Pigs, and Other | \$ 2.0307 | \$ 0.3673 | 8.6 | |
| | Poultry and Eggs | \$ 2.9018 | \$ 0.5291 | 11.7 | |
| | Dairy | \$ 2.2695 | \$ 0.4277 | 10.7 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 5.0% |
| | Total | | | | 25.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: INDIANA

Indiana Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Indiana's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Indiana. The success of Indiana animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Indiana during 2014 animal agriculture contributed:

- \$9.4 billion in economic output
- 48,865 jobs
- \$1.6 billion in earnings
- \$382.0 million in income taxes paid at local, state, and federal levels
- \$260.7 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Indiana increased economic output by over \$3.6 billion, boosted household earnings by \$618.0 million, contributed 18,617 additional jobs and paid \$146.7 million in additional tax revenues.

Indiana's animal agriculture consumed about 990.4 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (413.8 thousand tons)
- Egg-Laying Hens (169.5 thousand tons)
- Turkeys (161.0 thousand tons)

This report examines animal agriculture in Indiana over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Indiana, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Indiana and beyond.

Indiana Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Indiana's economy. In 2014, Indiana's animal agriculture contributed the following to the economy:

- About \$9.4 billion in economic output
- \$1.6 billion in household earnings
- 48,865 jobs
- \$382.0 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Indiana's animal agriculture has:

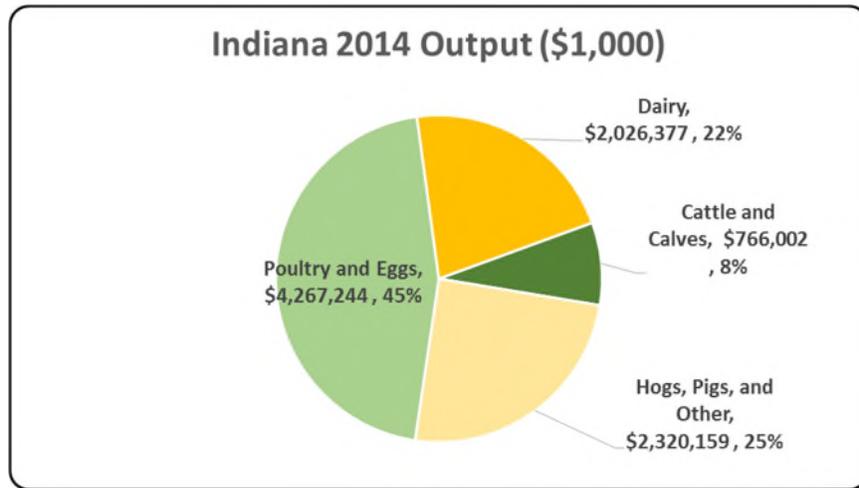
- Increased economic output by \$3.6 billion
- Boosted household earnings by \$618.0 million
- Added 18,617 jobs
- Paid an additional \$146.7 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 9,379,781 | \$ 3,605,502 | 62.44% |
| Earnings (\$1,000) | \$ 1,609,785 | \$ 617,995 | 62.31% |
| Employment (Jobs) | 48,865 | 18,617 | 61.55% |
| Income Taxes Paid (\$1,000) | \$ 382,002 | \$ 146,650 | 62.31% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 260,733 | | |

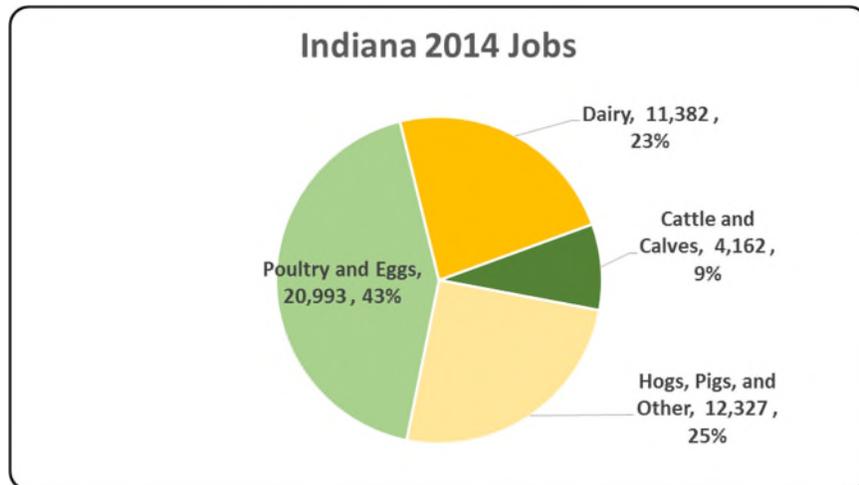
Indiana Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Indiana economy. Animal agriculture’s impact on Indiana total economic output is about \$9.4 billion.



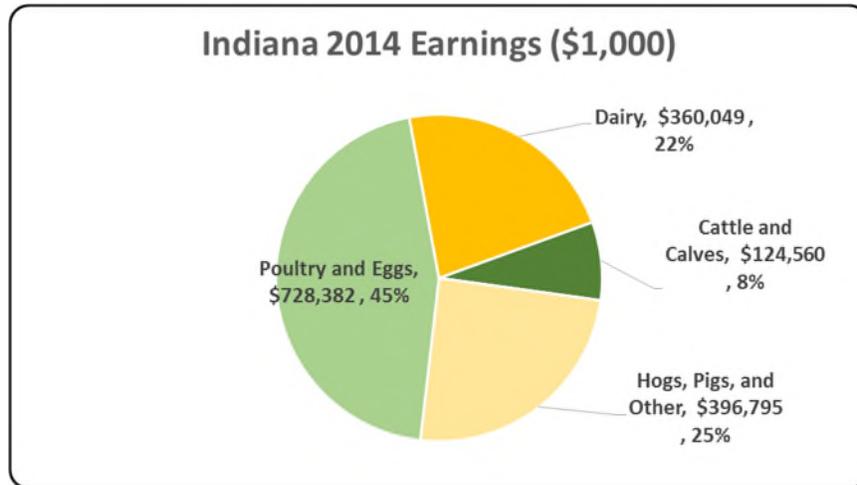
Indiana Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Indiana in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Indiana total jobs, contributing 48,865 jobs within and outside of animal agriculture.



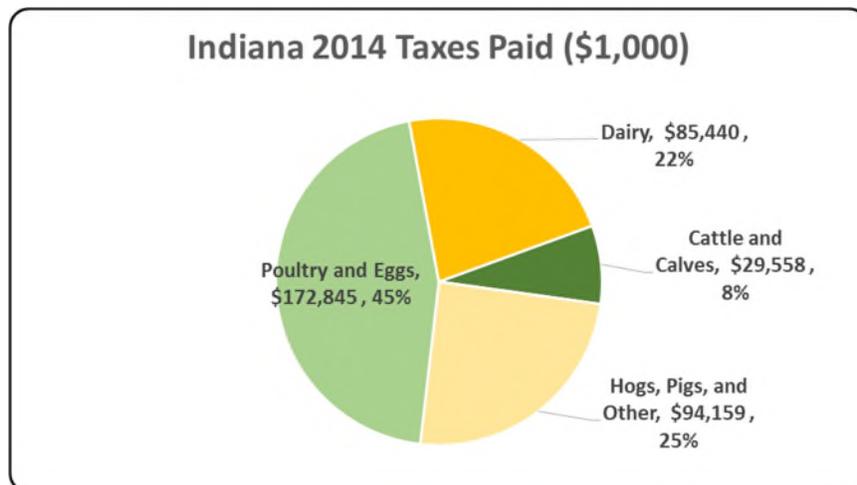
Indiana Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Indiana economy in terms of earnings. Indiana’s animal agriculture contributed about \$1.6 billion to household earnings in 2014.



Indiana Taxes Paid by Animal Agriculture

Indiana’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$382.0 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$260.7 million in property taxes paid by all of Indiana agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



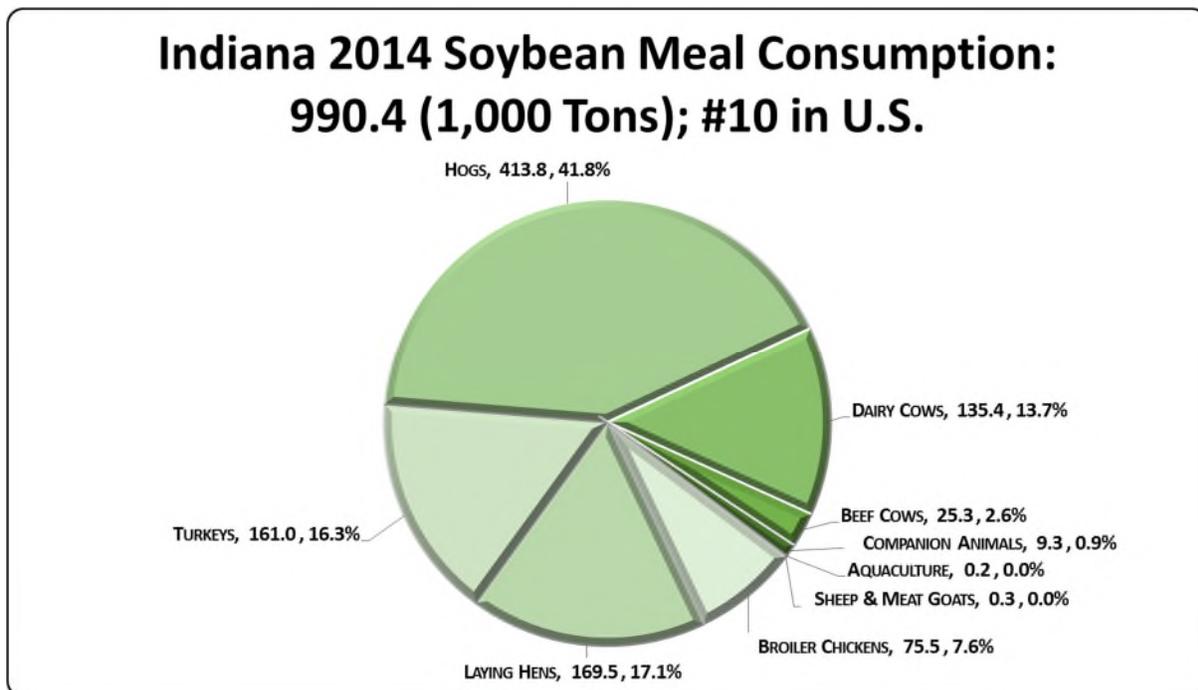
Indiana Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Indiana's animal agriculture consumed almost 990.4 thousand tons of soybean meal in 2014, placing the state as #10 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (413.8 thousand tons)
- Egg-Laying Hens (169.5 thousand tons)
- Turkeys (161.0 thousand tons)

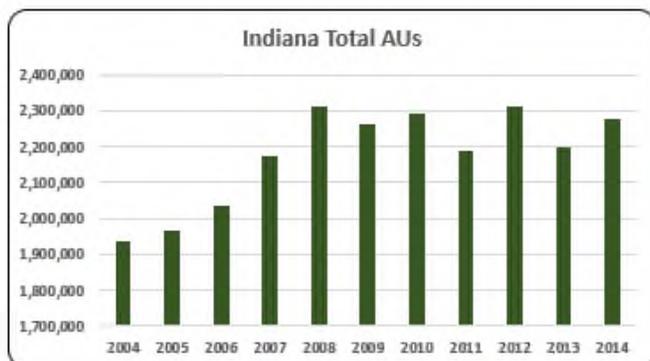
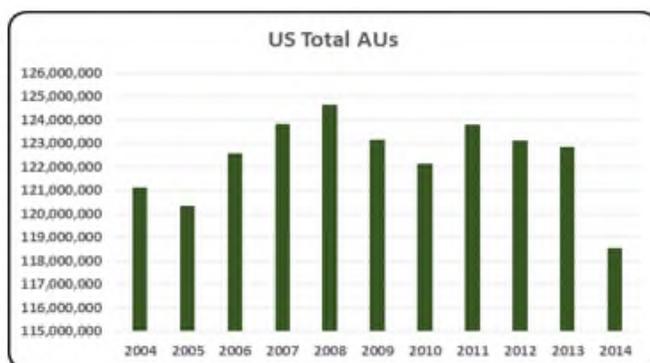


Indiana Animal Unit (AU) Trends

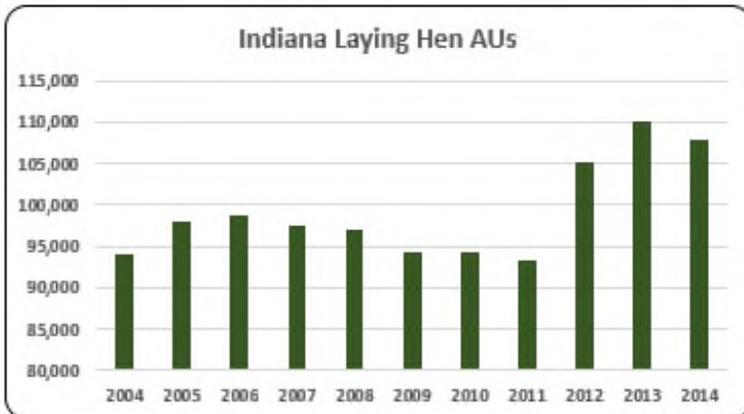
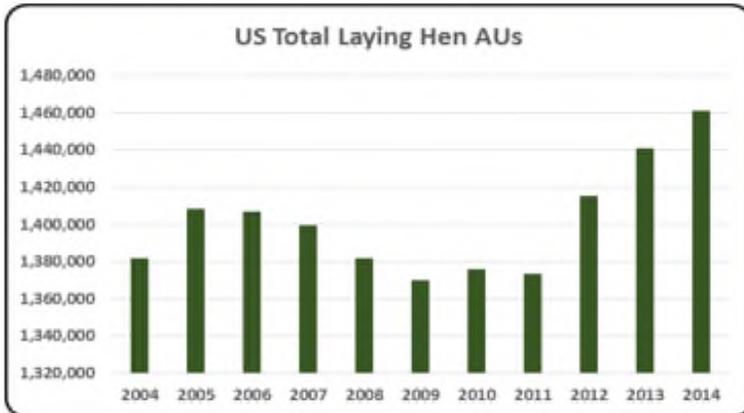
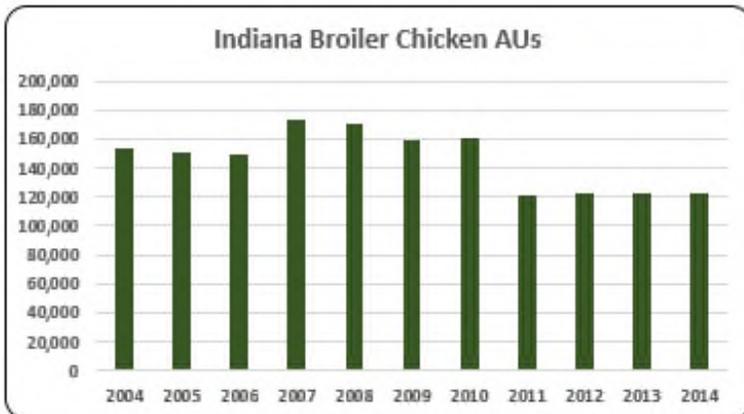
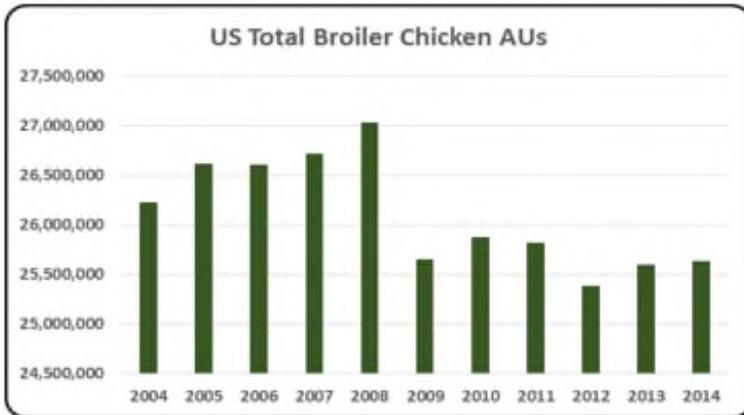
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Indiana. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Indiana and to give perspective on Indiana's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

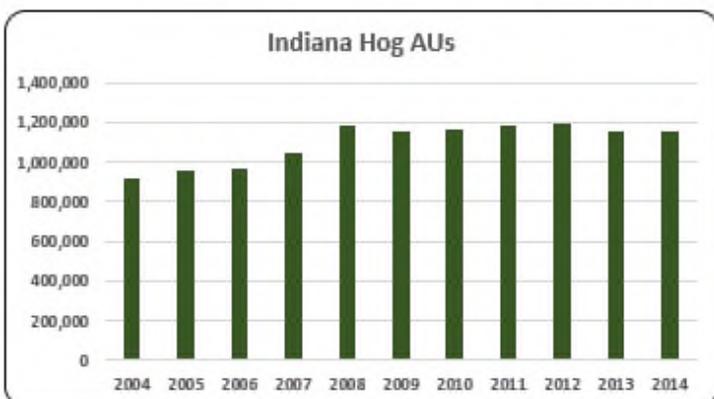
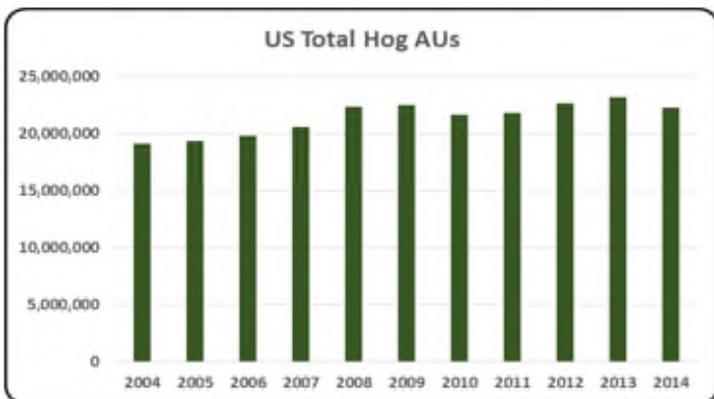
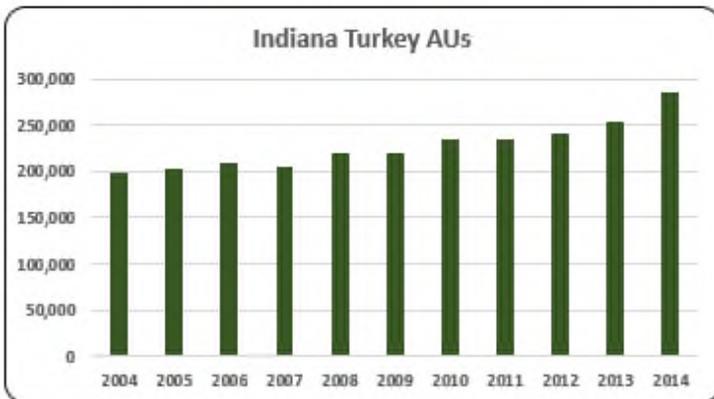
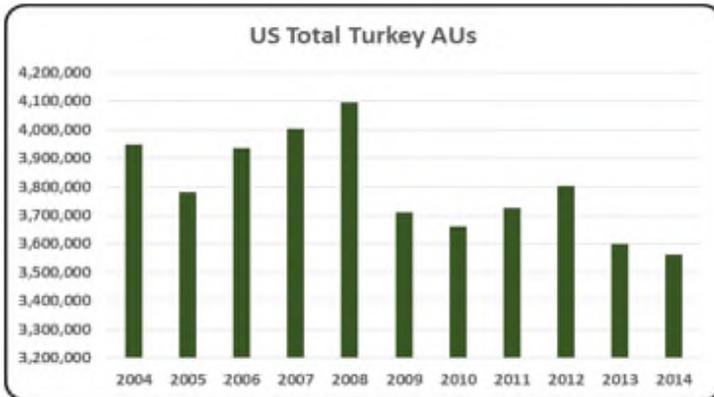
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Indiana, the largest three segments of animal agriculture in terms of AUs during 2014 were: Hogs (1,151.1 thousand AUs), Beef Cows (360.0 thousand AUs), and Turkeys (284.9 thousand AUs). Total animal units in Indiana during 2014 were 2,275 thousand AUs.



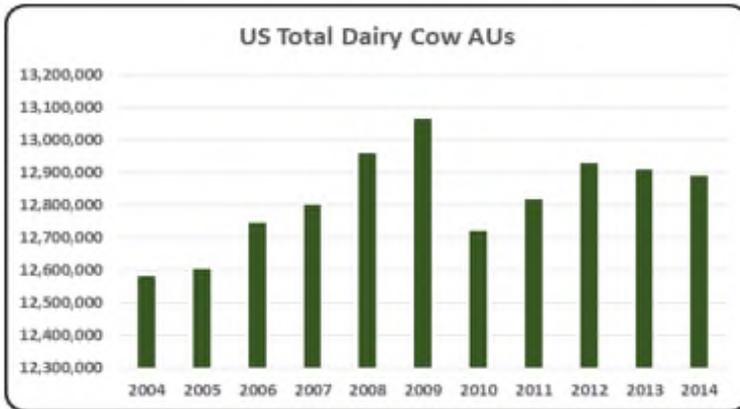
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- In 2014 there were 2,275.0 thousand AUs in the state of Indiana and 50.6% (1,151.1) were hog AUs. In general, from 2004 to 2014, there has been an upward trend in the number of AUs in Indiana.



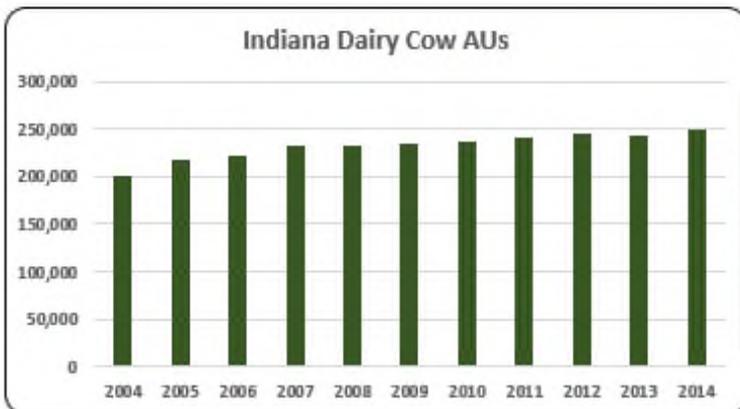
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler AUs were 121,829 in 2014 and experienced a reduction of -0.6% from a year earlier.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layers AUs have increased since 2012. In 2014 layer AUs (107,971) represented 7.4 % of all layers AUs in the U.S.



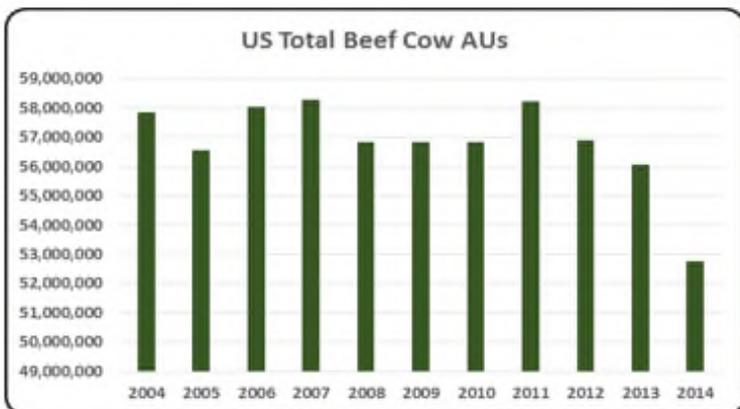
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey AUs in 2014 (284,908) increased 12.4% year-over-year. Those numbers represented 8.0% of all turkey AUs in the U.S.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- In 2014 over 5% (1,151.1 thousand) of all hog AUs in the U.S. were in Indiana. From 2004 (914,850) to 2008 (1,187.4 thousand) hog AUs increased 30%. From 2009 to 2014 hog AUs have averaged about 1,166.0 thousand.



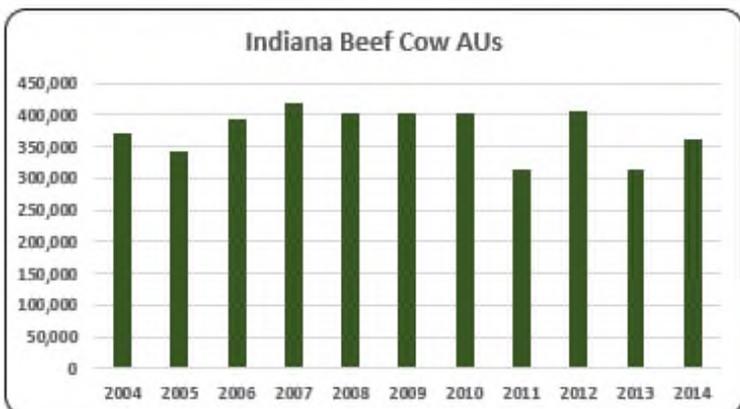
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- From 2004 to 2014, on average, there were 232,018 dairy cow AUs. This animal production has gradually increased throughout the decade.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production is the second most important animal production in Indiana. There were 360,000 beef cow AUs in 2014.

Indiana Additional Information and Methodology

Animal agriculture is an important part of Indiana's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Indiana, of interest is the degree to which the industry impacts the Indiana economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Indiana animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Indiana's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Indiana which have occurred. As shown in this state report, Indiana has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Indiana. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Indiana Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Indiana's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Indiana, \$1.926 to \$3.081 million in total economic activity, \$0.327 to \$0.526 in household wages and 10 to 15 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.0091 | \$ 0.3267 | 10.9 |
| | Hogs, Pigs, and Other | \$ 1.9255 | \$ 0.3293 | 10.2 |
| | Poultry and Eggs | \$ 3.0810 | \$ 0.5259 | 15.2 |
| | Dairy | \$ 2.1426 | \$ 0.3807 | 12.0 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 372,150 | 343,650 | 391,800 | 417,150 | 403,800 | 403,800 | 403,800 | 314,250 | 406,350 | 313,500 | 360,000 |
| | Hog and Pig AUs | 914,850 | 953,100 | 964,050 | 1,046,850 | 1,187,400 | 1,151,700 | 1,162,950 | 1,184,400 | 1,192,050 | 1,153,800 | 1,151,100 |
| | Broiler AUs | 153,858 | 150,619 | 149,602 | 173,789 | 171,079 | 159,063 | 161,202 | 121,468 | 122,954 | 122,525 | 121,829 |
| | Turkey AUs | 199,500 | 202,061 | 208,141 | 205,349 | 218,908 | 219,798 | 234,058 | 233,709 | 241,028 | 253,450 | 284,908 |
| | Egg Layer AUs | 94,004 | 98,092 | 98,620 | 97,404 | 96,988 | 94,156 | 94,384 | 93,172 | 105,047 | 110,119 | 107,971 |
| | Dairy AUs | 200,200 | 217,000 | 221,200 | 232,400 | 232,400 | 233,800 | 236,600 | 240,800 | 245,000 | 243,600 | 249,200 |
| | Total Animal Units | 1,934,562 | 1,964,523 | 2,033,413 | 2,172,942 | 2,310,575 | 2,262,317 | 2,292,995 | 2,187,798 | 2,312,429 | 2,196,995 | 2,275,008 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 189,713 | \$ 209,091 | \$ 227,138 | \$ 221,007 | \$ 183,082 | \$ 200,726 | \$ 215,539 | \$ 206,130 | \$ 289,984 | \$ 275,856 | \$ 381,266 |
| | Hogs and Pigs (\$1,000) | \$ 678,718 | \$ 703,129 | \$ 643,469 | \$ 712,960 | \$ 818,183 | \$ 722,435 | \$ 900,624 | \$ 1,081,867 | \$ 1,081,041 | \$ 1,056,695 | \$ 1,199,250 |
| | Broilers (\$1,000) | \$ 129,408 | \$ 122,581 | \$ 94,728 | \$ 130,738 | \$ 134,552 | \$ 116,550 | \$ 122,673 | \$ 108,082 | \$ 122,484 | \$ 149,216 | \$ 156,532 |
| | Turkeys (\$1,000) | \$ 172,049 | \$ 192,960 | \$ 235,773 | \$ 269,606 | \$ 306,269 | \$ 271,500 | \$ 350,384 | \$ 393,923 | \$ 442,550 | \$ 441,061 | \$ 554,411 |
| | Eggs (\$1,000) | \$ 291,841 | \$ 192,327 | \$ 229,297 | \$ 422,640 | \$ 535,571 | \$ 353,020 | \$ 373,592 | \$ 420,152 | \$ 474,014 | \$ 545,130 | \$ 674,076 |
| | Milk (\$1,000) | \$ 505,509 | \$ 506,560 | \$ 435,841 | \$ 664,087 | \$ 644,252 | \$ 453,322 | \$ 590,968 | \$ 746,130 | \$ 716,632 | \$ 796,640 | \$ 945,756 |
| | Other | \$ 4,375 | \$ 4,413 | \$ 4,138 | \$ 4,260 | \$ 4,239 | \$ 4,791 | \$ 5,641 | \$ 5,216 | \$ 5,382 | \$ 5,548 | \$ 5,714 |
| | Sheep and Lambs (\$1,000) | \$ 2,685 | \$ 2,669 | \$ 2,339 | \$ 2,406 | \$ 2,330 | \$ 2,827 | \$ 3,622 | \$ 3,142 | \$ 3,254 | \$ 3,365 | \$ 3,476 |
| | Aquaculture (\$1,000) | \$ 1,690 | \$ 1,744 | \$ 1,799 | \$ 1,854 | \$ 1,909 | \$ 1,964 | \$ 2,019 | \$ 2,073 | \$ 2,128 | \$ 2,183 | \$ 2,238 |
| | Total (\$1,000) | \$ 1,971,612 | \$ 1,931,061 | \$ 1,870,384 | \$ 2,425,298 | \$ 2,626,148 | \$ 2,122,344 | \$ 2,559,421 | \$ 2,961,500 | \$ 3,132,086 | \$ 3,270,146 | \$ 3,917,005 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 8,831 | 8,248 | 8,676 | 8,394 | |
| | Cattle feedlots (112112) | 1,986 | 2,493 | 1,114 | 319 | |
| | Dairy cattle and milk production (11212) | 1,921 | 1,875 | 1,462 | 1,459 | |
| | Hog and pig farming (1122) | 3,432 | 2,221 | 1,959 | 1,301 | |
| | Poultry and egg production (1123) | 673 | 705 | 1,442 | 1,336 | |
| | Sheep and goat farming (1124) | 663 | 980 | 1,547 | 1,719 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,881 | 6,570 | 5,616 | 6,645 | |
| Value of Sales (\$1,000) | Cattle and Calves | 357,904 | 324,054 | 456,657 | 522,694 | |
| | Hogs and Pigs | 843,326 | 633,112 | 974,290 | 1,273,099 | |
| | Poultry and Eggs | 516,328 | 455,153 | 887,196 | 1,164,199 | |
| | Milk and Other Dairy Products | 262,007 | 333,339 | 583,212 | 659,314 | |
| | Aquaculture | 2,678 | 3,151 | 2,567 | 5,120 | |
| | Other (calculated) | 43,561 | 41,602 | 48,350 | 32,396 | |
| | Total | 2,025,804 | 1,790,411 | 2,952,272 | 3,656,822 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 14,780 | 14,613 | 11,645 | 14,009 | |
| | | \$1,000 | 282,253 | 307,156 | 511,239 | 508,824 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 6,852 | 5,669 | 6,826 | |
| | | \$1,000 | <i>n/a</i> | 39,425 | 57,350 | 84,804 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 9,431 | 7,398 | 9,346 | |
| | | \$1,000 | <i>n/a</i> | 267,731 | 453,890 | 424,019 |
| Feed purchased | (Farms) | 25,765 | 29,682 | 24,908 | 28,754 | |
| | \$1,000 | 818,113 | 660,587 | 1,092,067 | 1,592,005 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 766,002 | \$ 124,560 | 4,162 | \$ 29,558 |
| | Hogs, Pigs, and Other | \$ 2,320,159 | \$ 396,795 | 12,327 | \$ 94,159 |
| | Poultry and Eggs | \$ 4,267,244 | \$ 728,382 | 20,993 | \$ 172,845 |
| | Dairy | \$ 2,026,377 | \$ 360,049 | 11,382 | \$ 85,440 |
| | Total | \$ 9,379,781 | \$ 1,609,785 | 48,865 | \$ 382,002 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 288,328 | \$ 46,885 | 1,567 | \$ 11,126 |
| | Hogs, Pigs, and Other | \$ 671,786 | \$ 114,889 | 3,569 | \$ 27,263 |
| | Poultry and Eggs | \$ 1,976,394 | \$ 337,353 | 9,723 | \$ 80,054 |
| | Dairy | \$ 668,994 | \$ 118,868 | 3,758 | \$ 28,207 |
| | Total | \$ 3,605,502 | \$ 617,995 | 18,617 | \$ 146,650 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.0091 | \$ 0.3267 | 10.9 | |
| | Hogs, Pigs, and Other | \$ 1.9255 | \$ 0.3293 | 10.2 | |
| | Poultry and Eggs | \$ 3.0810 | \$ 0.5259 | 15.2 | |
| | Dairy | \$ 2.1426 | \$ 0.3807 | 12.0 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 3.4% |
| | Total | | | | 23.7% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: IOWA

Iowa Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Iowa's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Iowa. The success of Iowa animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Iowa during 2014 animal agriculture contributed:

- \$30.1 billion in economic output
- 128,621 jobs
- \$5 billion in earnings
- \$1.4 billion in income taxes paid at local, state, and federal levels
- \$437.3 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Iowa increased economic output by over \$13.5 billion, boosted household earnings by \$2.2 billion, contributed 57,872 additional jobs and paid \$632.5 million in additional tax revenues.

Iowa's animal agriculture consumed about 3.1 million tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (2.3 million tons)
- Egg-Laying Hens (368.4 thousand tons)
- Beef Cows (165.6 thousand tons)

This report examines animal agriculture in Iowa over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Iowa, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Iowa and beyond.

Iowa Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Iowa's economy. In 2014, Iowa's animal agriculture contributed the following to the economy:

- About \$30.1 billion in economic output
- \$5.0 billion in household earnings
- 128,621 jobs
- \$1.4 billion in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Iowa's animal agriculture has:

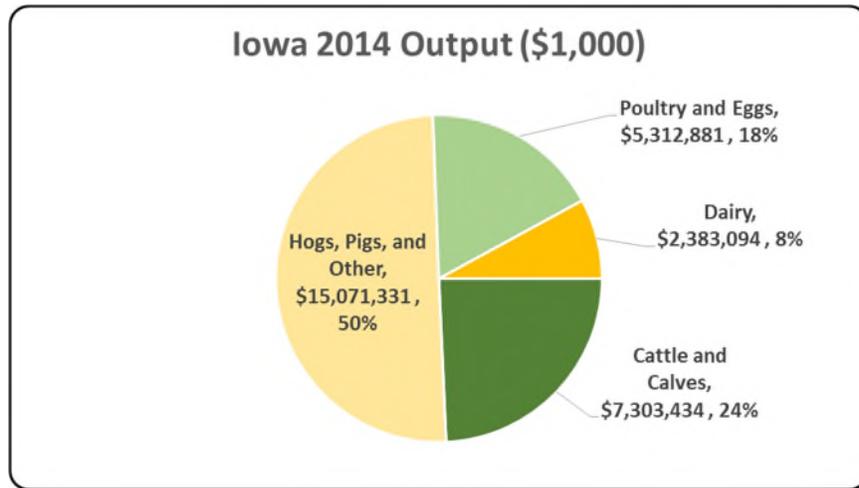
- Increased economic output by \$13.5 billion
- Boosted household earnings by \$2.2 billion
- Added 57,872 jobs
- Paid an additional \$632.5 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 30,070,740 | \$ 13,534,986 | 81.85% |
| Earnings (\$1,000) | \$ 4,974,654 | \$ 2,238,815 | 81.83% |
| Employment (Jobs) | 128,621 | 57,872 | 81.80% |
| Income Taxes Paid (\$1,000) | \$ 1,405,340 | \$ 632,465 | 81.83% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 437,312 | | |

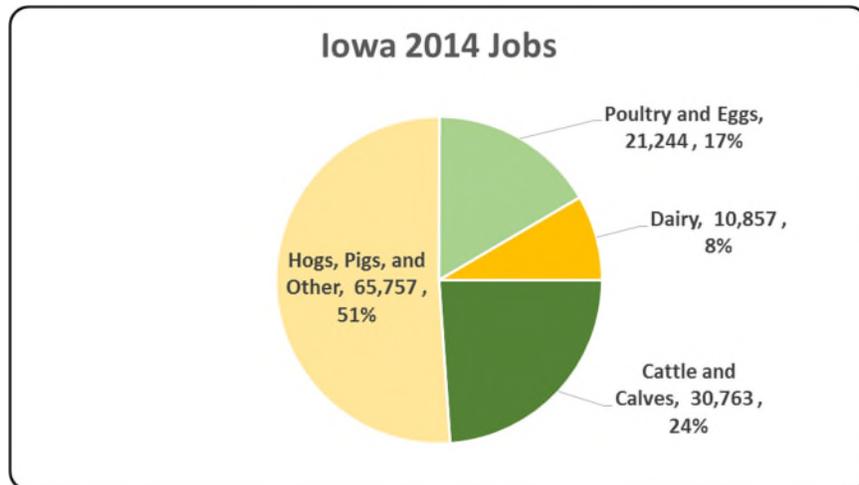
Iowa Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Iowa economy. Animal agriculture’s impact on Iowa total economic output is about \$30.1 billion.



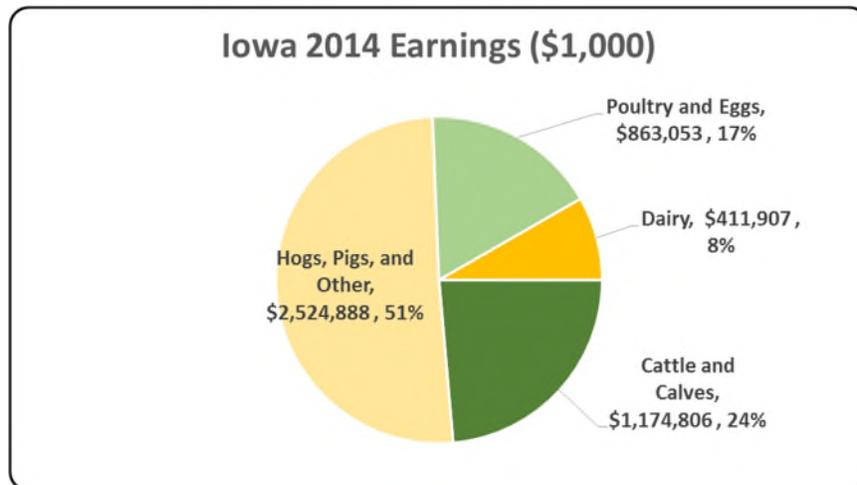
Iowa Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Iowa in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Iowa total jobs, contributing 128,621 jobs within and outside of animal agriculture.



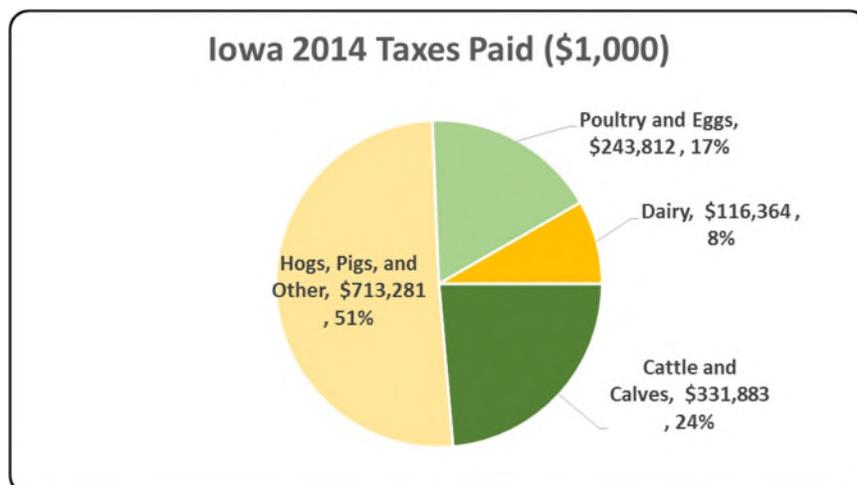
Iowa Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Iowa economy in terms of earnings. Iowa’s animal agriculture contributed about \$5.0 billion to household earnings in 2014.



Iowa Taxes Paid by Animal Agriculture

Iowa’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$1.4 billion in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$437.3 million in property taxes paid by all of Iowa agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



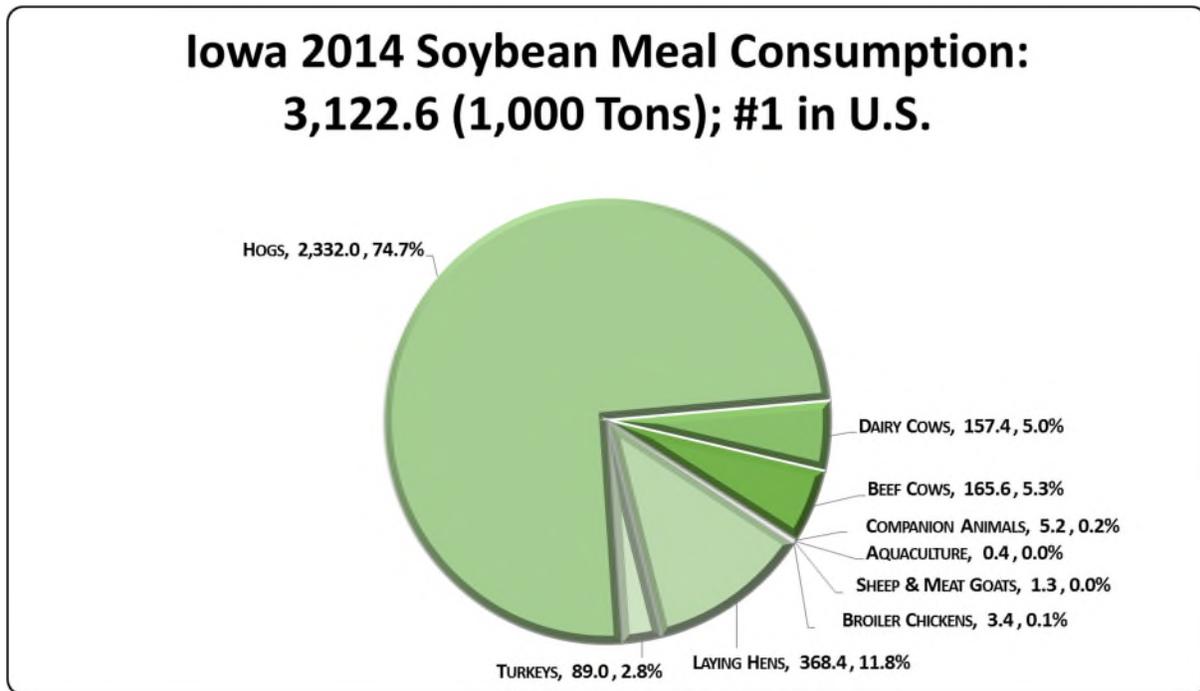
Iowa Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Iowa’s animal agriculture consumed almost 3.1 million tons of soybean meal in 2014, placing the state as #1 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (2.3 million tons)
- Egg-Laying Hens (368.4 thousand tons)
- Beef Cows (165.6 thousand tons)

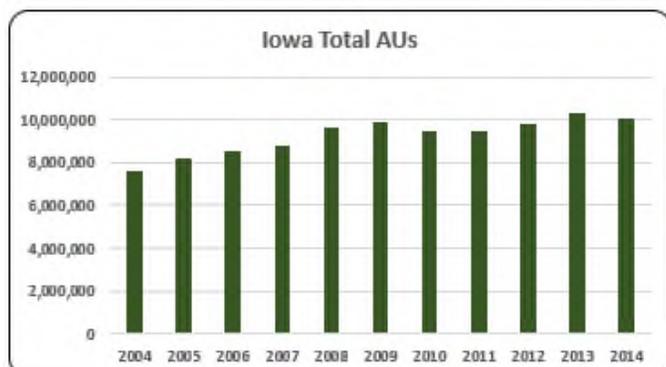
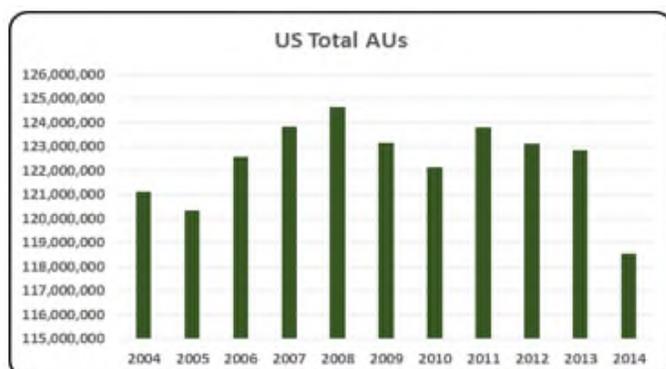


Iowa Animal Unit (AU) Trends

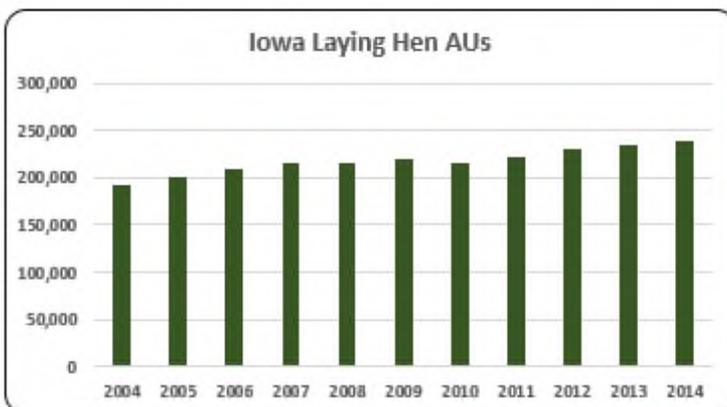
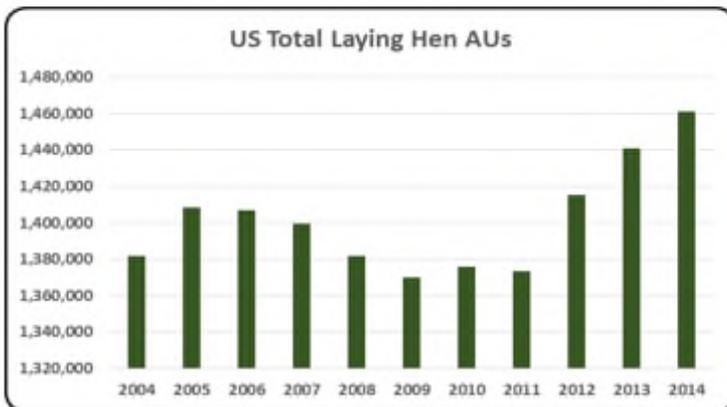
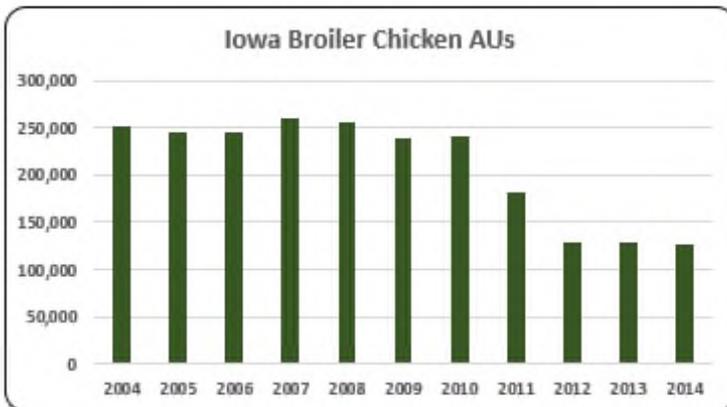
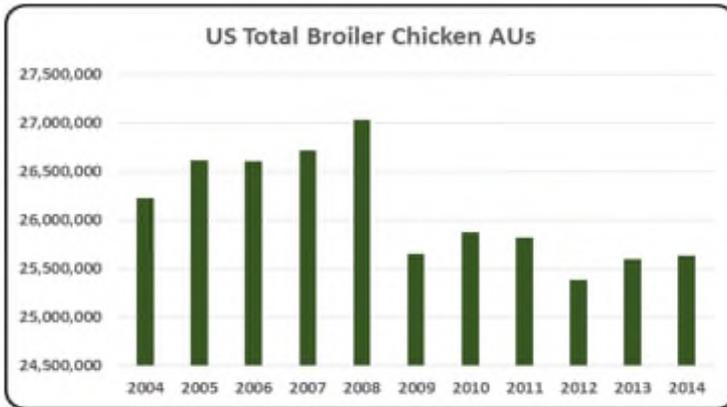
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Iowa. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Iowa and to give perspective on Iowa's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Iowa, the largest three segments of animal agriculture in terms of AUs during 2014 were: Hogs (6,557.7 thousand AUs), Beef Cows (2,694.1 thousand AUs), and Dairy Cows (287.0 thousand AUs). Total animal units in Iowa during 2014 were 10,063.1 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- There were 10,063 thousand AUs in the state of Iowa in 2014 which accounts for 8.5% of all AUs in the U.S.

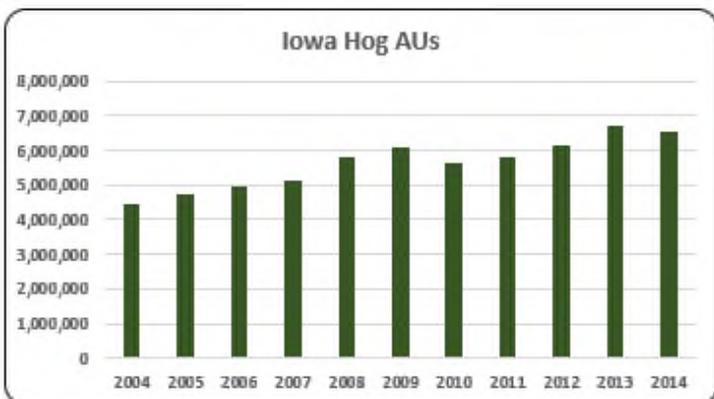
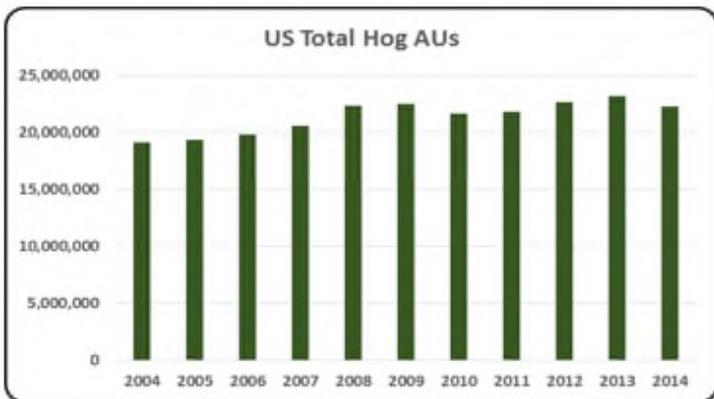
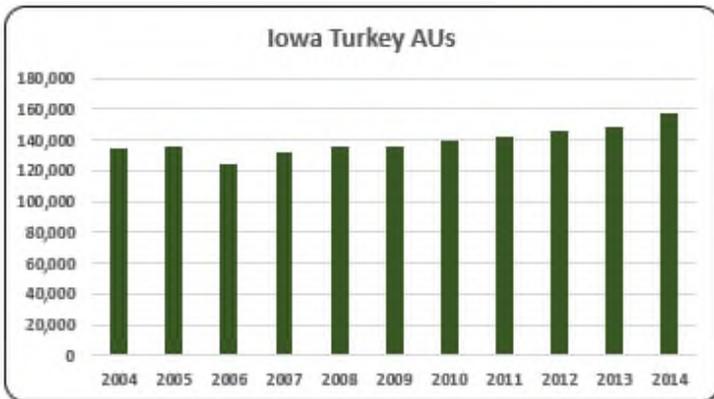
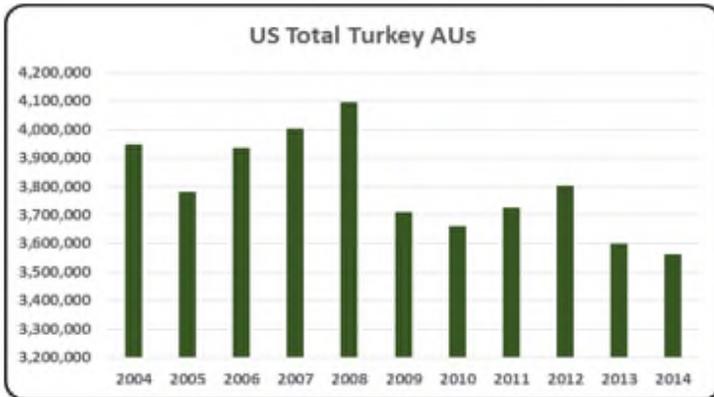


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

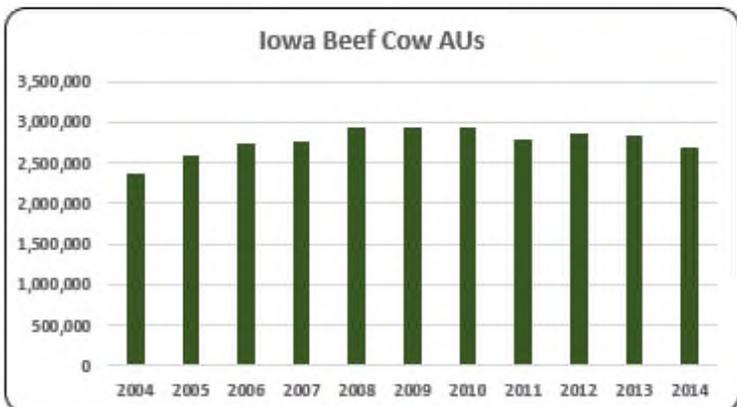
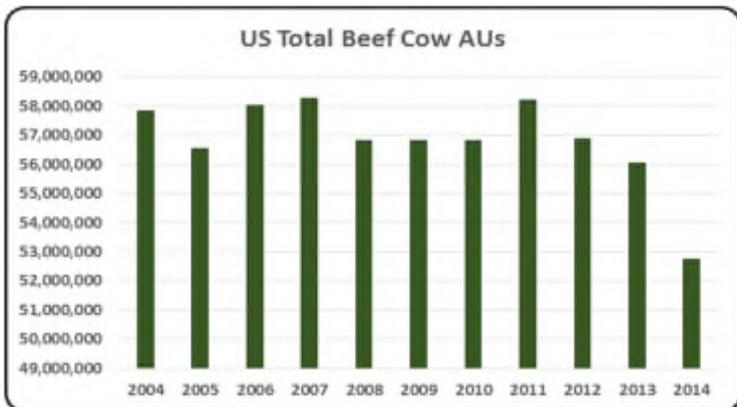
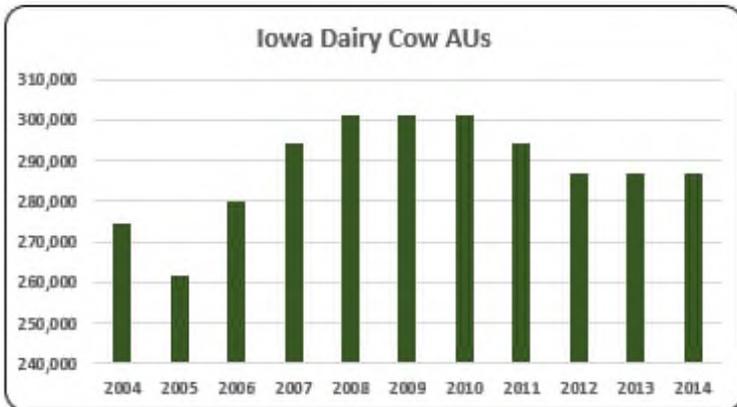
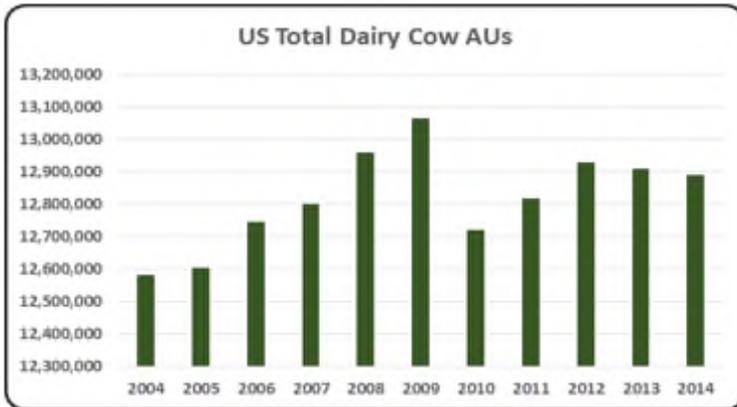
- Broiler production has been decreasing in Iowa from 251,368 AUs in 2004 to 127,252 AUs in 2014.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

- As the number one egg producer in the country, Iowa housed 16.40% (239,576) of all layer AUs in the country in 2014. Layers AUs have increased 25% during the past decade.



- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Over 4% of all turkey AUs in the U.S. in 2014 were in Iowa. In 2014 Iowa’s turkey AUs (157,449) increased 6.1% year-over-year.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Iowa is the number one hog producer in the country with 6,557.7 hog AUs in 2014. About 20.5% of all hog AUs in the U.S. in 2014 were in Iowa. Overall the industry has followed an upward trend from and increased 48% from 2004-2014.



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.

- Iowa's dairy cow AUs averaged 288,018 over the last decade, but numbers have decreased since 2010.

- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.

- Beef cow AUs have increased 14.4% over the last decade. In 2014 there were 2,694.1 beef cow AUs in Iowa.

Iowa Additional Information and Methodology

Animal agriculture is an important part of Iowa's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Iowa, of interest is the degree to which the industry impacts the Iowa economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Iowa animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Iowa's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Iowa which have occurred. As shown in this state report, Iowa has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Iowa. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Iowa Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Iowa's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Iowa, \$1.874 to \$2.815 million in total economic activity, \$0.314 to \$0.457 in household wages and 8 to 11 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.5588 | \$ 0.4116 | 10.8 |
| | Hogs, Pigs, and Other | \$ 1.8743 | \$ 0.3140 | 8.2 |
| | Poultry and Eggs | \$ 2.8151 | \$ 0.4573 | 11.3 |
| | Dairy | \$ 2.0851 | \$ 0.3604 | 9.5 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| Animal Units (AUs) | Beef Cattle AUs | 2,354,700 | 2,576,700 | 2,738,700 | 2,756,700 | 2,924,700 | 2,924,700 | 2,924,700 | 2,785,500 | 2,861,100 | 2,841,900 | 2,694,075 |
| | Hog and Pig AUs | 4,433,850 | 4,758,300 | 4,940,700 | 5,134,950 | 5,820,300 | 6,069,150 | 5,607,000 | 5,823,450 | 6,155,250 | 6,682,800 | 6,557,700 |
| | Broiler AUs | 251,368 | 246,077 | 244,415 | 260,465 | 256,404 | 238,395 | 241,602 | 182,049 | 128,427 | 127,978 | 127,252 |
| | Turkey AUs | 135,000 | 135,713 | 123,678 | 131,363 | 135,874 | 135,542 | 138,972 | 142,416 | 146,077 | 148,450 | 157,449 |
| | Egg Layer AUs | 191,916 | 201,400 | 208,656 | 216,536 | 214,872 | 218,700 | 214,856 | 221,652 | 230,832 | 234,575 | 239,576 |
| | Dairy AUs | 274,400 | 261,800 | 280,000 | 294,000 | 301,000 | 301,000 | 301,000 | 294,000 | 287,000 | 287,000 | 287,000 |
| | Total Animal Units | 7,641,234 | 8,179,989 | 8,536,149 | 8,794,015 | 9,653,149 | 9,887,487 | 9,428,130 | 9,449,067 | 9,808,687 | 10,322,703 | 10,063,052 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 1,311,027 | \$ 1,350,505 | \$ 1,387,461 | \$ 1,445,594 | \$ 1,601,554 | \$ 1,416,653 | \$ 1,692,657 | \$ 1,941,155 | \$ 2,201,647 | \$ 2,273,750 | \$ 2,854,242 |
| | Hogs and Pigs (\$1,000) | \$ 3,264,095 | \$ 3,617,637 | \$ 3,417,443 | \$ 3,632,366 | \$ 4,029,267 | \$ 3,582,445 | \$ 4,503,113 | \$ 5,926,789 | \$ 6,174,367 | \$ 6,890,501 | \$ 8,017,968 |
| | Broilers (\$1,000) | \$ 211,422 | \$ 200,268 | \$ 154,764 | \$ 195,944 | \$ 201,659 | \$ 174,679 | \$ 183,856 | \$ 161,988 | \$ 127,935 | \$ 155,858 | \$ 163,500 |
| | Turkeys (\$1,000) | \$ 136,080 | \$ 131,580 | \$ 123,246 | \$ 143,167 | \$ 201,600 | \$ 213,475 | \$ 233,713 | \$ 253,084 | \$ 274,458 | \$ 290,238 | \$ 320,276 |
| | Eggs (\$1,000) | \$ 491,656 | \$ 335,318 | \$ 406,865 | \$ 824,806 | \$ 1,117,850 | \$ 755,830 | \$ 832,528 | \$ 947,998 | \$ 1,062,683 | \$ 1,166,457 | \$ 1,403,504 |
| | Milk (\$1,000) | \$ 627,713 | \$ 615,825 | \$ 536,380 | \$ 817,098 | \$ 799,015 | \$ 567,732 | \$ 716,430 | \$ 886,215 | \$ 866,496 | \$ 944,435 | \$ 1,142,916 |
| | Other | \$ 27,079 | \$ 31,513 | \$ 26,590 | \$ 28,369 | \$ 26,363 | \$ 23,436 | \$ 27,044 | \$ 24,844 | \$ 24,255 | \$ 23,666 | \$ 23,077 |
| | Sheep and Lambs (\$1,000) | \$ 25,778 | \$ 30,044 | \$ 24,953 | \$ 26,564 | \$ 24,391 | \$ 21,296 | \$ 24,736 | \$ 22,368 | \$ 21,612 | \$ 20,855 | \$ 20,099 |
| | Aquaculture (\$1,000) | \$ 1,301 | \$ 1,469 | \$ 1,637 | \$ 1,805 | \$ 1,972 | \$ 2,140 | \$ 2,308 | \$ 2,476 | \$ 2,643 | \$ 2,811 | \$ 2,979 |
| | Total (\$1,000) | \$ 6,069,072 | \$ 6,282,646 | \$ 6,052,748 | \$ 7,087,343 | \$ 7,977,308 | \$ 6,734,250 | \$ 8,189,341 | \$ 10,142,072 | \$ 10,731,841 | \$ 11,744,904 | \$ 13,925,483 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|------------------|------------------|-------------------|-------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 11,392 | 10,065 | 10,673 | 9,697 | |
| | Cattle feedlots (112112) | 3,914 | 4,259 | 3,119 | 2,129 | |
| | Dairy cattle and milk production (11212) | 2,675 | 2,306 | 1,686 | 1,224 | |
| | Hog and pig farming (1122) | 9,388 | 5,742 | 4,970 | 3,310 | |
| | Poultry and egg production (1123) | 448 | 442 | 775 | 732 | |
| | Sheep and goat farming (1124) | 1,251 | 1,098 | 1,434 | 1,621 | |
| | Animal aquaculture and other animal production (1125,1129) | 3,098 | 4,162 | 4,308 | 3,941 | |
| Value of Sales (\$1,000) | Cattle and Calves | 1,886,416 | 2,119,935 | 3,606,633 | 4,504,373 | |
| | Hogs and Pigs | 3,012,764 | 3,078,455 | 4,827,224 | 6,767,424 | |
| | Poultry and Eggs | 414,587 | 511,949 | 872,263 | 1,291,808 | |
| | Milk and Other Dairy Products | 407,897 | 442,431 | 689,680 | 799,467 | |
| | Aquaculture | 1,628 | 2,308 | 3,507 | 7,690 | |
| | Other (calculated) | 57,197 | 47,284 | 75,204 | 69,206 | |
| | Total | 5,780,489 | 6,202,362 | 10,074,511 | 13,439,968 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 30,572 | 25,756 | 22,679 | 24,040 |
| | | \$1,000 | 1,260,448 | 1,854,227 | 3,290,203 | 3,435,345 |
| | Breeding livestock purchased | (Farms) | n/a | 13,436 | 10,743 | 12,791 |
| | | \$1,000 | n/a | 100,883 | 180,644 | 239,793 |
| | Other livestock and poultry purchased | (Farms) | n/a | 16,372 | 15,086 | 15,123 |
| | | \$1,000 | n/a | 1,753,344 | 3,109,559 | 3,195,553 |
| Feed purchased | (Farms) | 46,733 | 41,037 | 35,808 | 38,194 | |
| | \$1,000 | 1,585,107 | 1,922,817 | 3,058,988 | 5,377,863 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|----------------------|---------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 7,303,434 | \$ 1,174,806 | 30,763 | \$ 331,883 |
| | Hogs, Pigs, and Other | \$ 15,071,331 | \$ 2,524,888 | 65,757 | \$ 713,281 |
| | Poultry and Eggs | \$ 5,312,881 | \$ 863,053 | 21,244 | \$ 243,812 |
| | Dairy | \$ 2,383,094 | \$ 411,907 | 10,857 | \$ 116,364 |
| | Total | \$ 30,070,740 | \$ 4,974,654 | 128,621 | \$ 1,405,340 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 3,099,264 | \$ 498,537 | 13,055 | \$ 140,837 |
| | Hogs, Pigs, and Other | \$ 7,340,569 | \$ 1,229,760 | 32,027 | \$ 347,407 |
| | Poultry and Eggs | \$ 2,352,348 | \$ 382,128 | 9,406 | \$ 107,951 |
| | Dairy | \$ 742,805 | \$ 128,390 | 3,384 | \$ 36,270 |
| | Total | \$ 13,534,986 | \$ 2,238,815 | 57,872 | \$ 632,465 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.5588 | \$ 0.4116 | 10.8 | |
| | Hogs, Pigs, and Other | \$ 1.8743 | \$ 0.3140 | 8.2 | |
| | Poultry and Eggs | \$ 2.8151 | \$ 0.4573 | 11.3 | |
| | Dairy | \$ 2.0851 | \$ 0.3604 | 9.5 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 7.9% |
| | Total | | | | 28.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: KANSAS

Kansas Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Kansas's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Kansas. The success of Kansas animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Kansas during 2014 animal agriculture contributed:

- \$16.3 billion in economic output
- 75,643 jobs
- \$2.6 billion in earnings
- \$653.3 million in income taxes paid at local, state, and federal levels
- \$227.6 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Kansas increased economic output by over \$4.3 billion, boosted household earnings by \$691.3 million, contributed 20,329 additional jobs and paid \$174.4 million in additional tax revenues.

Kansas's animal agriculture consumed about 403.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (184.8 thousand tons)
- Beef Cows (157.4 thousand tons)
- Dairy Cows (44.1 thousand tons)

This report examines animal agriculture in Kansas over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Kansas, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Kansas and beyond.

Kansas Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Kansas's economy. In 2014, Kansas's animal agriculture contributed the following to the economy:

- About \$16.3 billion in economic output
- \$2.6 billion in household earnings
- 75,643 jobs
- \$653.3 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Kansas's animal agriculture has:

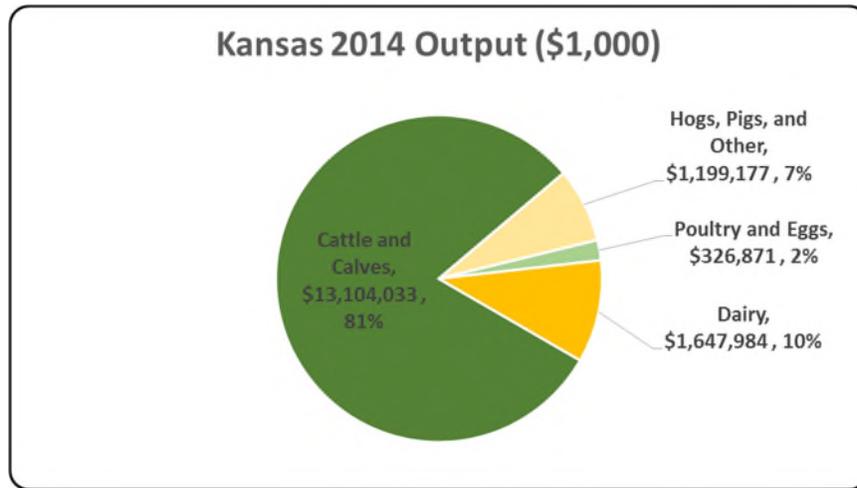
- Increased economic output by \$4.3 billion
- Boosted household earnings by \$691.3 million
- Added 20,329 jobs
- Paid an additional \$174.4 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 16,278,065 | \$ 4,327,931 | 36.22% |
| Earnings (\$1,000) | \$ 2,589,457 | \$ 691,271 | 36.42% |
| Employment (Jobs) | 75,643 | 20,329 | 36.75% |
| Income Taxes Paid (\$1,000) | \$ 653,320 | \$ 174,408 | 36.42% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 227,644 | | |

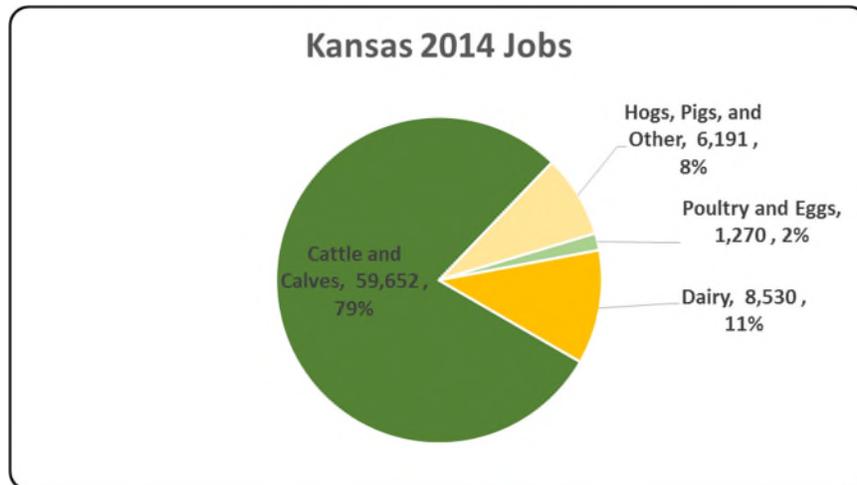
Kansas Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Kansas economy. Animal agriculture’s impact on Kansas total economic output is about \$16.3 billion.



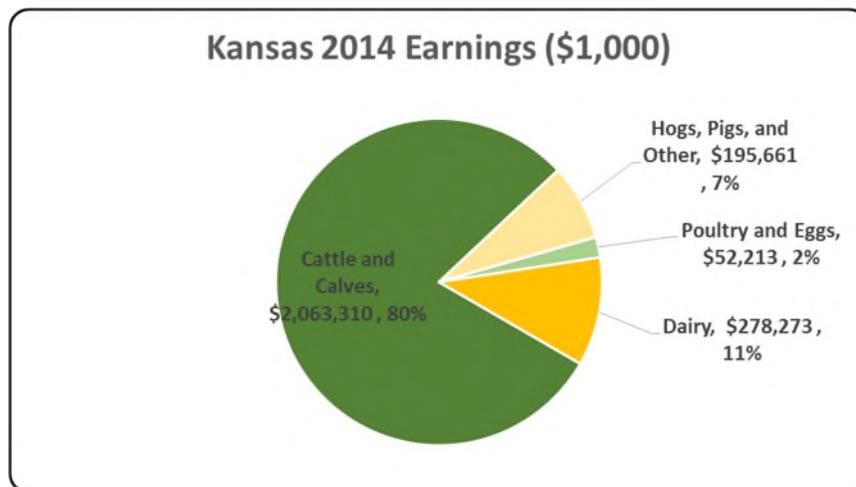
Kansas Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Kansas in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Kansas total jobs, contributing 75,643 jobs within and outside of animal agriculture.



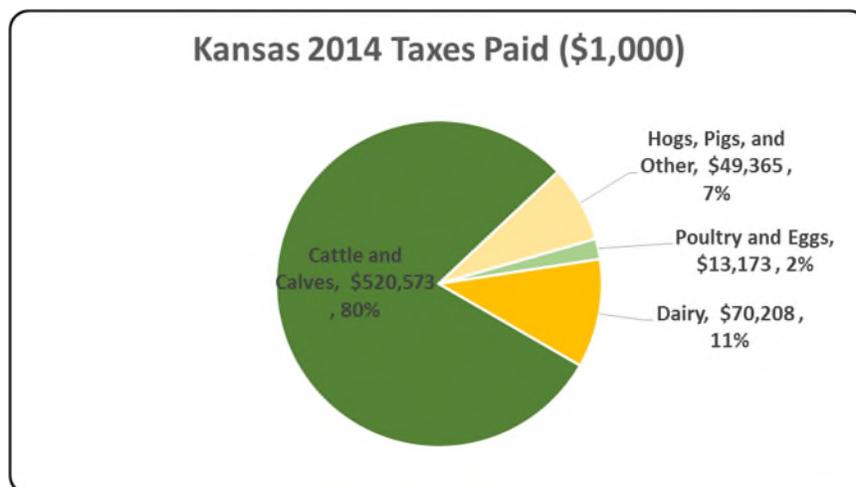
Kansas Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Kansas economy in terms of earnings. Kansas’s animal agriculture contributed about \$2.6 billion to household earnings in 2014.



Kansas Taxes Paid by Animal Agriculture

Kansas’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$653.3 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$227.6 million in property taxes paid by all of Kansas agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



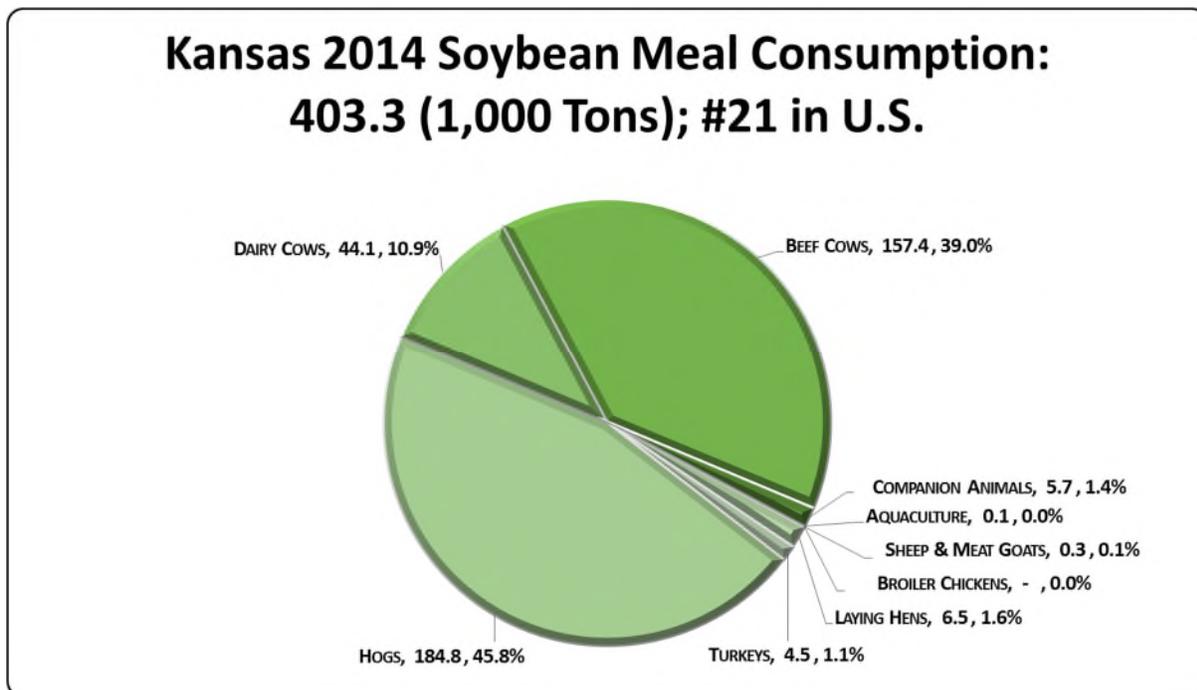
Kansas Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Kansas’s animal agriculture consumed almost 403.3 thousand tons of soybean meal in 2014, placing the state as #21 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (184.8 thousand tons)
- Beef Cows (157.4 thousand tons)
- Dairy Cows (44.1 thousand tons)

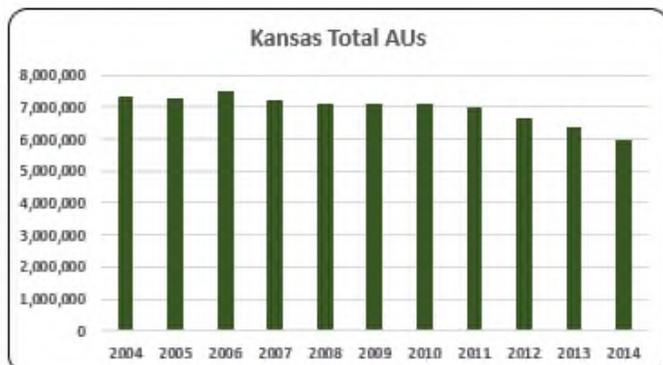
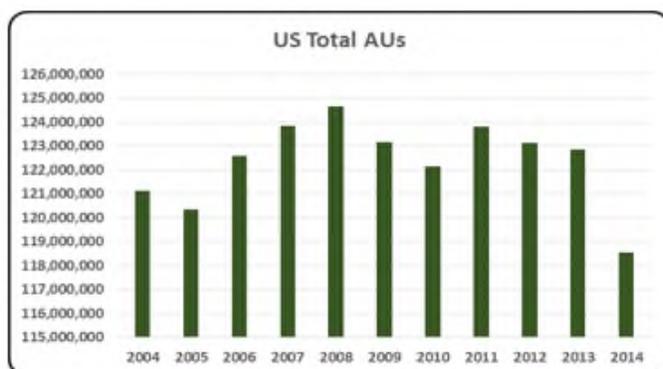


Kansas Animal Unit (AU) Trends

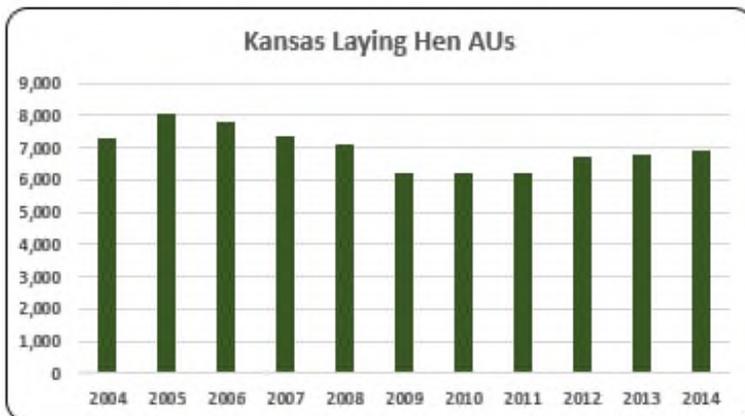
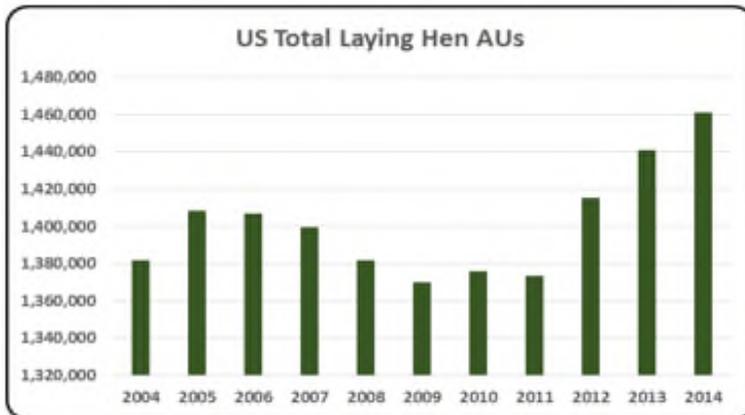
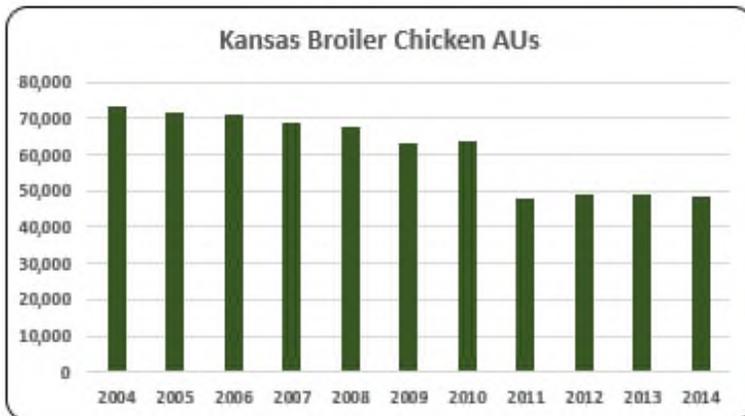
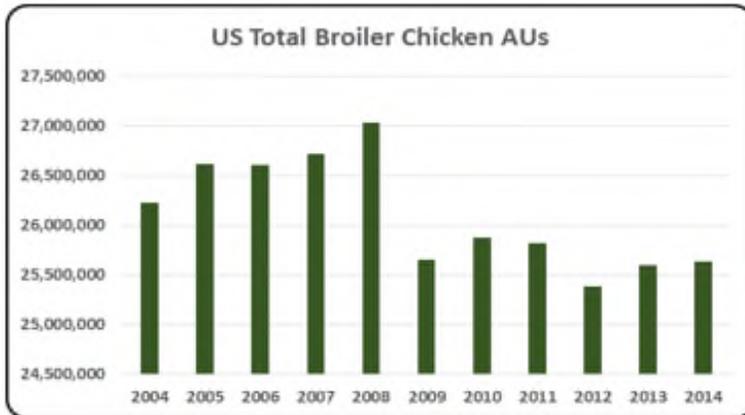
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Kansas. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Kansas and to give perspective on Kansas's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Kansas, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (5,268.2 thousand AUs), Hogs (461.1 thousand AUs), and Dairy Cows (190.4 thousand AUs). Total animal units in Kansas during 2014 were 5,983.2 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- There were on average 6,975.8 thousand AUs in Kansas from 2004 to 2014. AUs have been declining during the decade from the record high of 7,505.3 thousand AUs in 2007 to lowest level of 5,983.2 thousand in 2014.

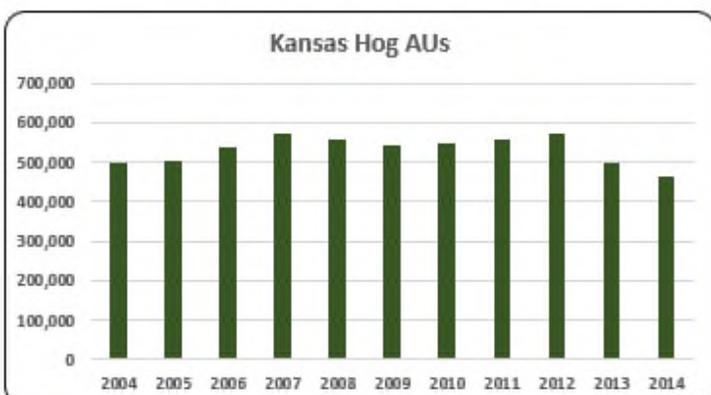
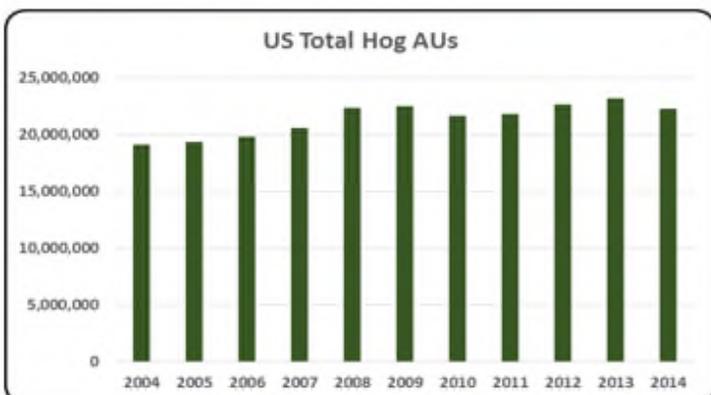
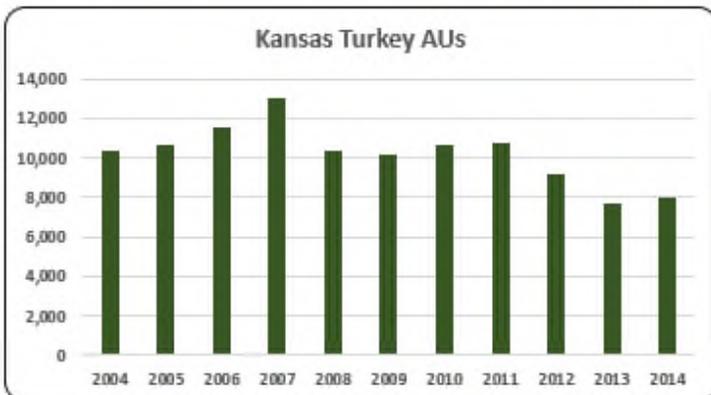
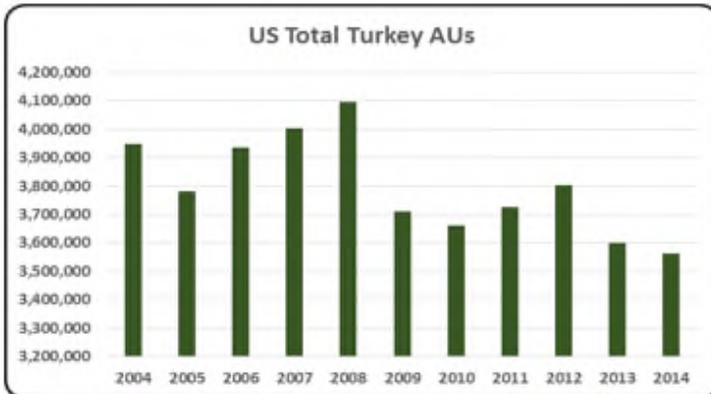


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

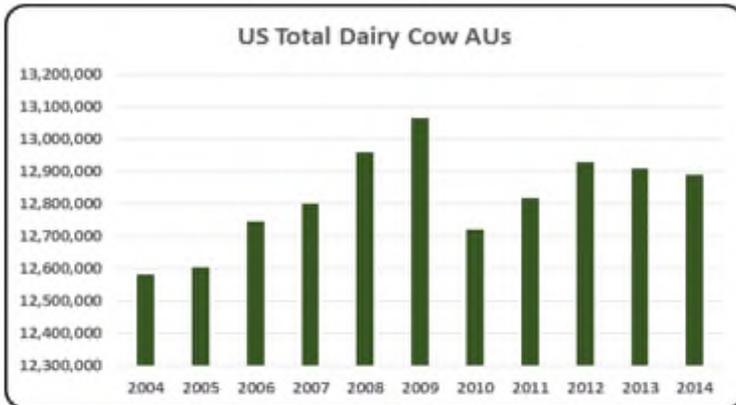
- The broiler production in Kansas has been shrinking since the beginning of the decade, from 73,132 broiler AUs in 2004 to 48,623 AUs in 2014.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

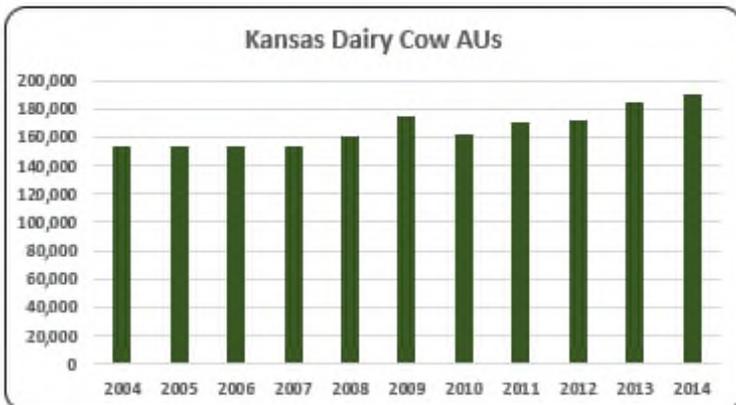
- On average there were 6,969 layer AUs in the state showing an increment of 1.6% from a year earlier.



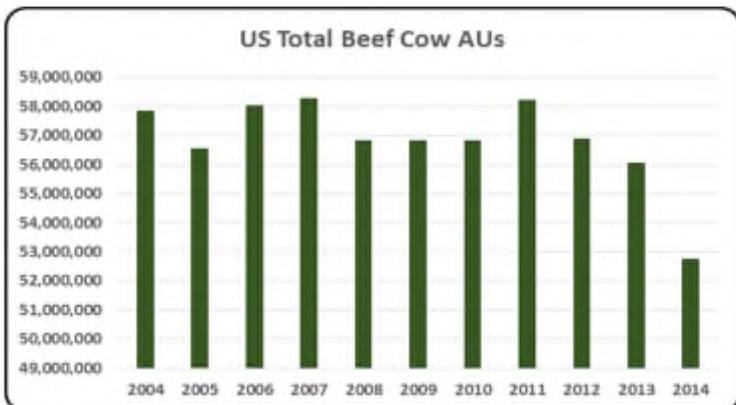
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Despite the decreasing trend in turkey AUs in Kansas, last year turkey AUs grew 4.4% to 8,027.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog AUs in 2014 (461,100) represent about 7.7% of all AUs present in the state. Hog AUs deteriorated since 2012.



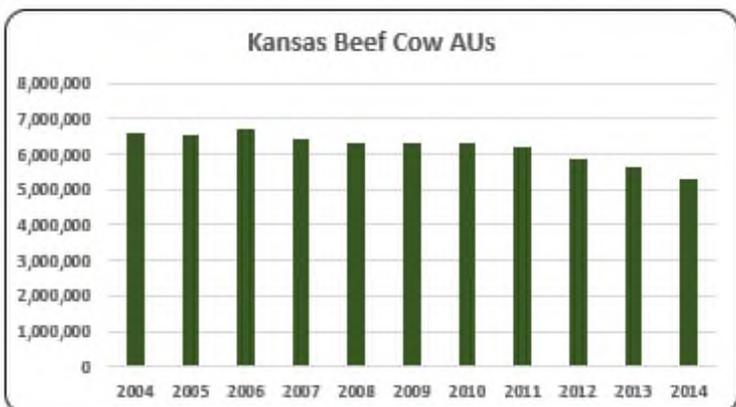
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Among all animal production in Kansas, dairy cow production has shown the most consistent growth during the decade with a 24% increase from 154,000 dairy cow AUs in 2004 to 190,400 dairy cow AUs in 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- About 88.1% of all AUs in Kansas were beef cow AUs in 2014. The beef cow production has experienced a declining trend from a record high of 6,725.5 thousand beef cow AUs in 2006 to record low of 5,268.2 thousand beef cow AUs in 2014.

Kansas Additional Information and Methodology

Animal agriculture is an important part of Kansas's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Kansas, of interest is the degree to which the industry impacts the Kansas economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Kansas animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Kansas's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Kansas which have occurred. As shown in this state report, Kansas has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Kansas. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Kansas Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Kansas's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Kansas, \$1.955 to \$2.796 million in total economic activity, \$0.319 to \$0.440 in household wages and 10 to 13 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.7957 | \$ 0.4402 | 12.7 |
| | Hogs, Pigs, and Other | \$ 1.9551 | \$ 0.3190 | 10.1 |
| | Poultry and Eggs | \$ 2.5248 | \$ 0.4033 | 9.8 |
| | Dairy | \$ 2.2072 | \$ 0.3727 | 11.4 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 6,611,475 | 6,551,475 | 6,725,475 | 6,419,475 | 6,323,475 | 6,323,475 | 6,323,475 | 6,192,150 | 5,832,150 | 5,628,150 | 5,268,150 |
| | Hog and Pig AUs | 499,200 | 500,400 | 535,350 | 569,550 | 555,450 | 544,200 | 546,750 | 558,000 | 572,250 | 497,250 | 461,100 |
| | Broiler AUs | 73,132 | 71,593 | 71,110 | 68,819 | 67,745 | 62,987 | 63,835 | 48,100 | 49,072 | 48,901 | 48,623 |
| | Turkey AUs | 10,398 | 10,664 | 11,587 | 13,003 | 10,394 | 10,181 | 10,605 | 10,794 | 9,214 | 7,686 | 8,027 |
| | Egg Layer AUs | 7,311 | 8,052 | 7,770 | 7,334 | 7,124 | 6,231 | 6,190 | 6,226 | 6,700 | 6,804 | 6,912 |
| | Dairy AUs | 154,000 | 154,000 | 154,000 | 154,000 | 161,000 | 175,000 | 162,400 | 170,800 | 172,200 | 184,800 | 190,400 |
| | Total Animal Units | 7,355,516 | 7,296,184 | 7,505,292 | 7,232,181 | 7,125,189 | 7,122,075 | 7,113,254 | 6,986,070 | 6,641,586 | 6,373,591 | 5,983,213 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 2,795,597 | \$ 2,973,468 | \$ 2,971,488 | \$ 3,328,059 | \$ 3,320,511 | \$ 2,964,814 | \$ 3,444,301 | \$ 4,224,540 | \$ 4,216,036 | \$ 4,167,701 | \$ 4,687,210 |
| | Hogs and Pigs (\$1,000) | \$ 355,685 | \$ 364,804 | \$ 341,113 | \$ 361,160 | \$ 350,741 | \$ 325,010 | \$ 438,565 | \$ 599,038 | \$ 568,278 | \$ 567,739 | \$ 607,795 |
| | Broilers (\$1,000) | \$ 61,511 | \$ 58,266 | \$ 45,027 | \$ 51,771 | \$ 53,281 | \$ 46,153 | \$ 48,577 | \$ 42,799 | \$ 48,884 | \$ 59,554 | \$ 62,474 |
| | Turkeys (\$1,000) | \$ 9,648 | \$ 10,230 | \$ 12,091 | \$ 14,996 | \$ 14,038 | \$ 9,415 | \$ 12,613 | \$ 14,146 | \$ 13,363 | \$ 8,800 | \$ 14,734 |
| | Eggs (\$1,000) | \$ 31,229 | \$ 18,905 | \$ 20,959 | \$ 34,403 | \$ 41,461 | \$ 29,509 | \$ 32,393 | \$ 35,517 | \$ 39,831 | \$ 45,001 | \$ 52,256 |
| | Milk (\$1,000) | \$ 341,264 | \$ 330,020 | \$ 297,815 | \$ 422,091 | \$ 456,435 | \$ 348,320 | \$ 431,981 | \$ 542,850 | \$ 519,080 | \$ 592,264 | \$ 746,640 |
| | Other | \$ 6,464 | \$ 6,384 | \$ 5,656 | \$ 5,960 | \$ 5,319 | \$ 5,820 | \$ 6,375 | \$ 5,749 | \$ 5,687 | \$ 5,625 | \$ 5,564 |
| | Sheep and Lambs (\$1,000) | \$ 6,151 | \$ 6,042 | \$ 5,285 | \$ 5,560 | \$ 4,891 | \$ 5,363 | \$ 5,889 | \$ 5,235 | \$ 5,144 | \$ 5,053 | \$ 4,963 |
| | Aquaculture (\$1,000) | \$ 313 | \$ 342 | \$ 371 | \$ 400 | \$ 428 | \$ 457 | \$ 486 | \$ 515 | \$ 543 | \$ 572 | \$ 601 |
| | Total (\$1,000) | \$ 3,601,397 | \$ 3,762,076 | \$ 3,694,148 | \$ 4,218,439 | \$ 4,241,787 | \$ 3,729,040 | \$ 4,414,805 | \$ 5,464,639 | \$ 5,411,160 | \$ 5,446,684 | \$ 6,176,672 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 |
|--------------------------|--|--------------------|-----------|-----------|------------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 19,839 | 20,314 | 18,708 | 15,991 |
| | Cattle feedlots (112112) | 1,331 | 1,506 | 894 | 492 |
| | Dairy cattle and milk production (11212) | 764 | 608 | 523 | 398 |
| | Hog and pig farming (1122) | 1,098 | 634 | 618 | 348 |
| | Poultry and egg production (1123) | 256 | 299 | 691 | 385 |
| | Sheep and goat farming (1124) | 437 | 497 | 782 | 946 |
| | Animal aquaculture and other animal production (1125,1129) | 1,894 | 3,110 | 3,493 | 3,484 |
| Value of Sales (\$1,000) | Cattle and Calves | 5,437,006 | 5,715,204 | 8,542,872 | 10,153,087 |
| | Hogs and Pigs | 297,492 | 297,505 | 506,448 | 697,020 |
| | Poultry and Eggs | 48,014 | withheld | 69,807 | 88,403 |
| | Milk and Other Dairy Products | 155,047 | 248,542 | 376,511 | 482,765 |
| | Aquaculture | withheld | 745 | 2,228 | 4,997 |
| | Other (calculated) | 23,063 | 65,801 | 28,105 | 33,581 |
| | Total | 5,960,622 | 6,327,797 | 9,525,971 | 11,459,853 |
| Input Purchases | Livestock and poultry purchased | (Farms) 19,518 | 16,103 | 15,145 | 16,190 |
| | | \$1,000 2,687,621 | 3,554,091 | 5,192,954 | 5,440,898 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 9,506 | 9,558 | 10,480 |
| | | \$1,000 <i>n/a</i> | 60,943 | 150,517 | 206,584 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 8,750 | 7,797 | 8,352 |
| | | \$1,000 <i>n/a</i> | 3,493,148 | 5,042,438 | 5,234,314 |
| Feed purchased | (Farms) 32,955 | 33,531 | 29,672 | 32,131 | |
| | \$1,000 1,506,407 | 1,410,837 | 2,237,287 | 4,207,051 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 13,104,033 | \$ 2,063,310 | 59,652 | \$ 520,573 |
| | Hogs, Pigs, and Other | \$ 1,199,177 | \$ 195,661 | 6,191 | \$ 49,365 |
| | Poultry and Eggs | \$ 326,871 | \$ 52,213 | 1,270 | \$ 13,173 |
| | Dairy | \$ 1,647,984 | \$ 278,273 | 8,530 | \$ 70,208 |
| | Total | \$ 16,278,065 | \$ 2,589,457 | 75,643 | \$ 653,320 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 3,309,190 | \$ 521,052 | 15,064 | \$ 131,461 |
| | Hogs, Pigs, and Other | \$ 311,840 | \$ 50,881 | 1,610 | \$ 12,837 |
| | Poultry and Eggs | \$ 2,901 | \$ 463 | 11 | \$ 117 |
| | Dairy | \$ 704,000 | \$ 118,875 | 3,644 | \$ 29,992 |
| | Total | \$ 4,327,931 | \$ 691,271 | 20,329 | \$ 174,408 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 2.7957 | \$ 0.4402 | 12.7 | |
| | Hogs, Pigs, and Other | \$ 1.9551 | \$ 0.3190 | 10.1 | |
| | Poultry and Eggs | \$ 2.5248 | \$ 0.4033 | 9.8 | |
| | Dairy | \$ 2.2072 | \$ 0.3727 | 11.4 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 4.9% | |
| | Total | | | 25.2% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: KENTUCKY

Kentucky Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Kentucky's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Kentucky. The success of Kentucky animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Kentucky during 2014 animal agriculture contributed:

- \$7.7 billion in economic output
- 38,850 jobs
- \$1.3 billion in earnings
- \$339.3 million in income taxes paid at local, state, and federal levels
- \$113.7 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Kentucky increased economic output by over \$1.6 billion, boosted household earnings by \$267.4 million, contributed 7,951 additional jobs and paid \$69.9 million in additional tax revenues.

Kentucky's animal agriculture consumed about 467.4 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (362.9 thousand tons)
- Hogs (39.7 thousand tons)
- Dairy Cows (18.0 thousand tons)

This report examines animal agriculture in Kentucky over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Kentucky, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Kentucky and beyond.

Kentucky Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Kentucky's economy. In 2014, Kentucky's animal agriculture contributed the following to the economy:

- About \$7.7 billion in economic output
- \$1.3 billion in household earnings
- 38,850 jobs
- \$339.3 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Kentucky's animal agriculture has:

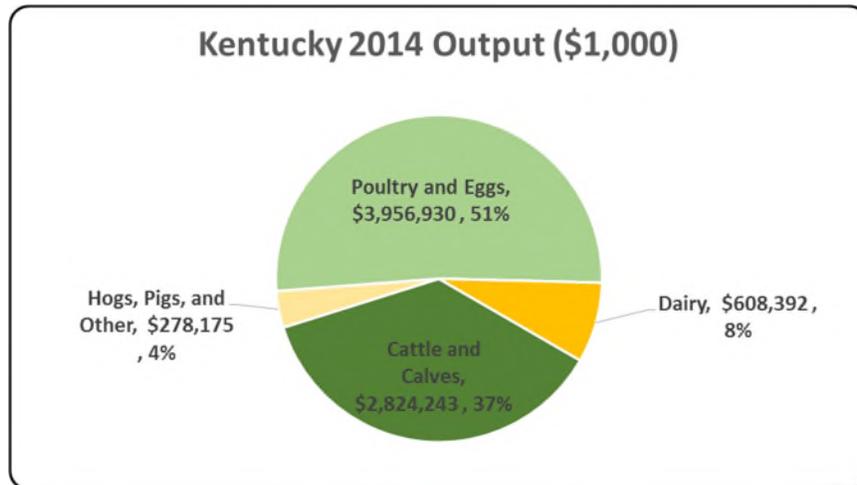
- Increased economic output by \$1.6 billion
- Boosted household earnings by \$267.4 million
- Added 7,951 jobs
- Paid an additional \$69.9 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 7,667,739 | \$ 1,594,978 | 26.26% |
| Earnings (\$1,000) | \$ 1,298,513 | \$ 267,395 | 25.93% |
| Employment (Jobs) | 38,850 | 7,951 | 25.73% |
| Income Taxes Paid (\$1,000) | \$ 339,302 | \$ 69,870 | 25.93% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 113,653 | | |

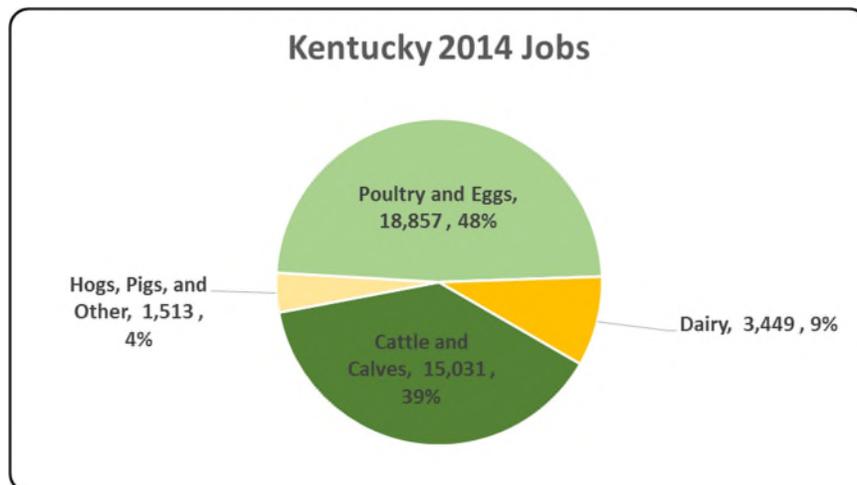
Kentucky Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Kentucky economy. Animal agriculture’s impact on Kentucky total economic output is about \$7.7 billion.



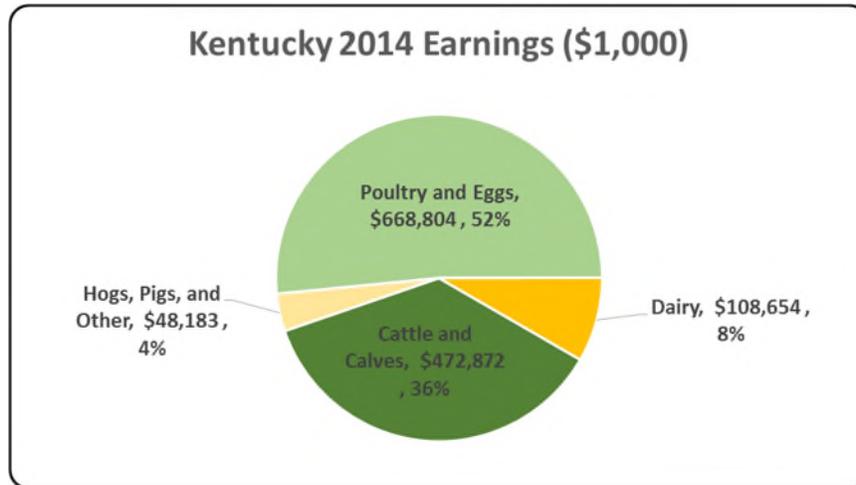
Kentucky Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Kentucky in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Kentucky total jobs, contributing 38,850 jobs within and outside of animal agriculture.



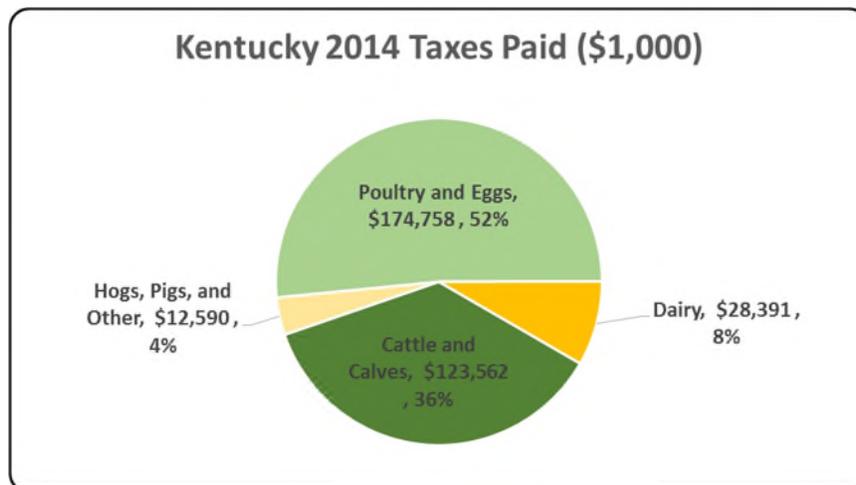
Kentucky Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Kentucky economy in terms of earnings. Kentucky’s animal agriculture contributed about \$1.3 billion to household earnings in 2014.



Kentucky Taxes Paid by Animal Agriculture

Kentucky’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$339.3 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$113.7 million in property taxes paid by all of Kentucky agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



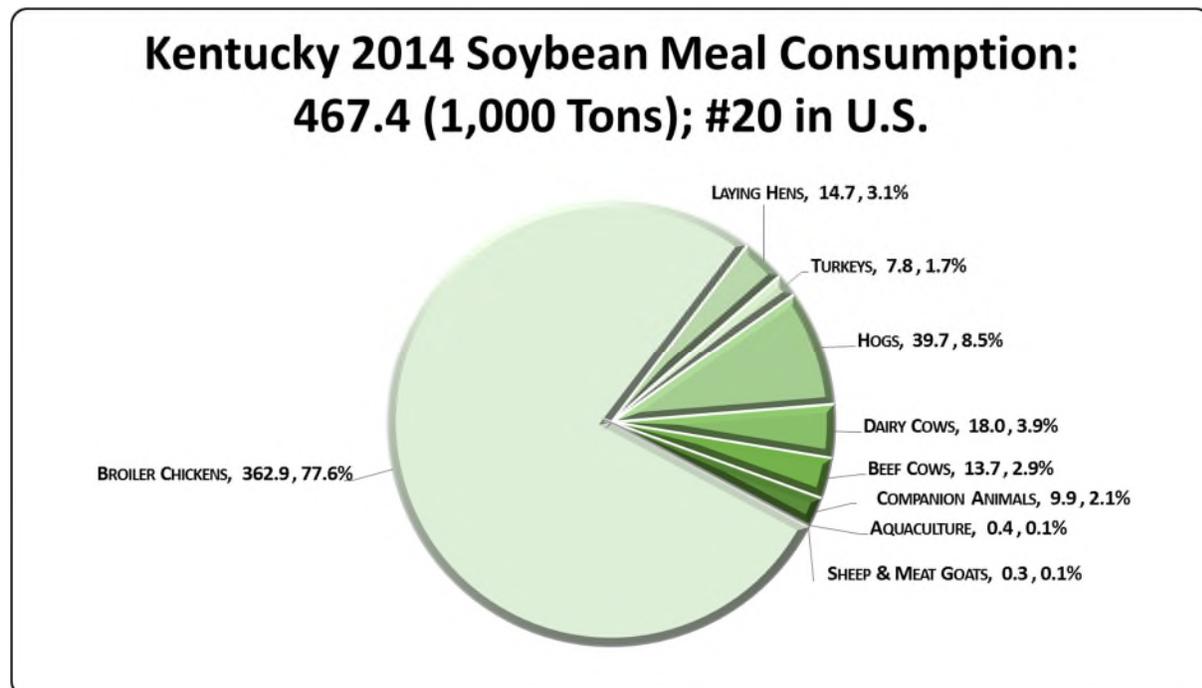
Kentucky Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Kentucky's animal agriculture consumed almost 467.4 thousand tons of soybean meal in 2014, placing the state as #20 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (362.9 thousand tons)
- Hogs (39.7 thousand tons)
- Dairy Cows (18.0 thousand tons)

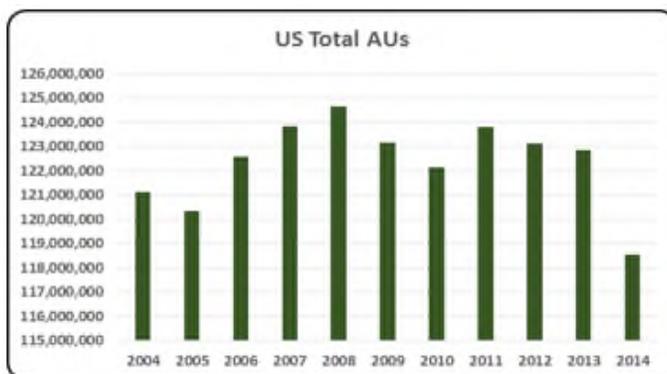


Kentucky Animal Unit (AU) Trends

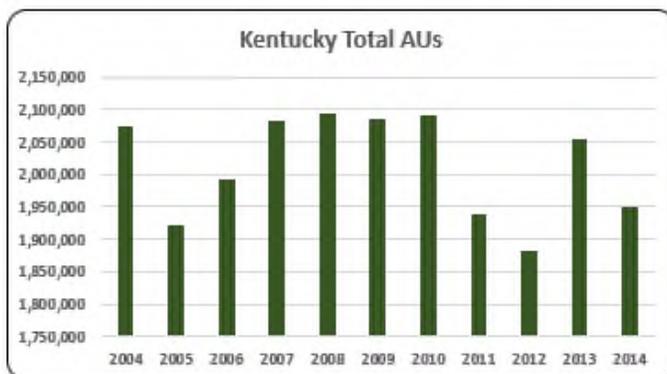
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Kentucky. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Kentucky and to give perspective on Kentucky's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

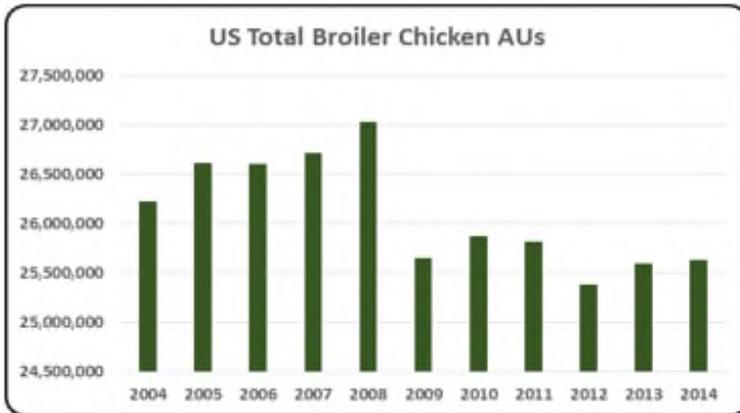
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Kentucky, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (925.7 thousand AUs), Beef Cows (801.3 thousand AUs), and Hogs (102.9 thousand AUs). Total animal units in Kentucky during 2014 were 1,950.4 thousand AUs.



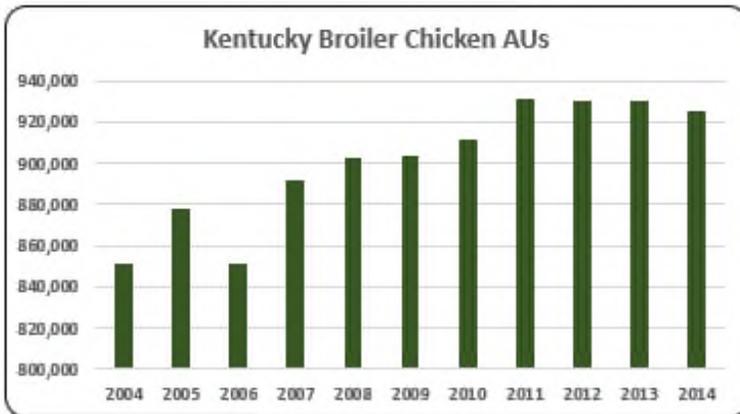
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



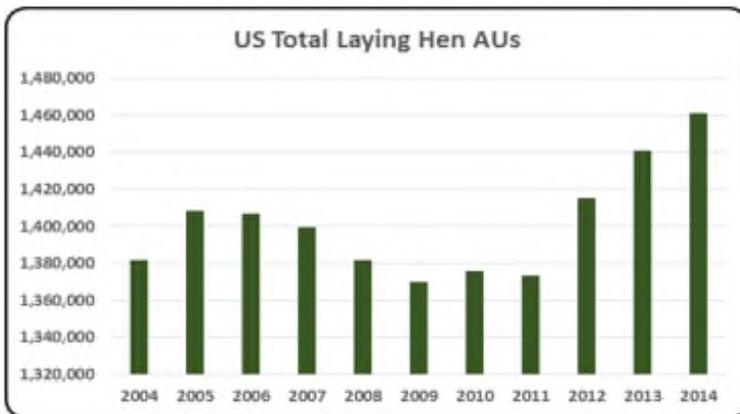
- The total number of AUs in Kentucky in 2014 was 1,950.4 thousand. Animal production has fallen with a decrease in AUs of about 6.0% throughout the decade.



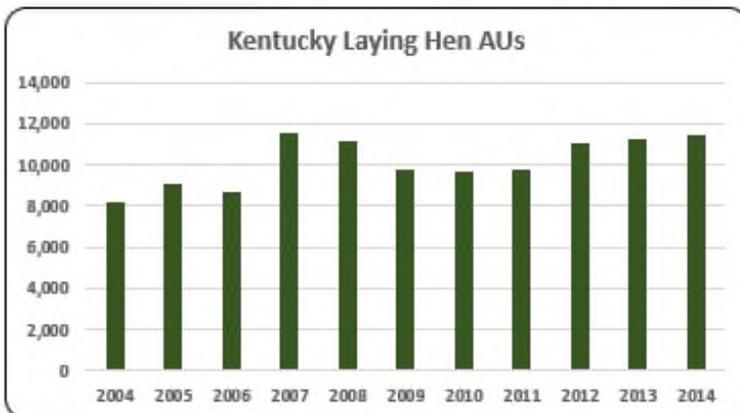
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



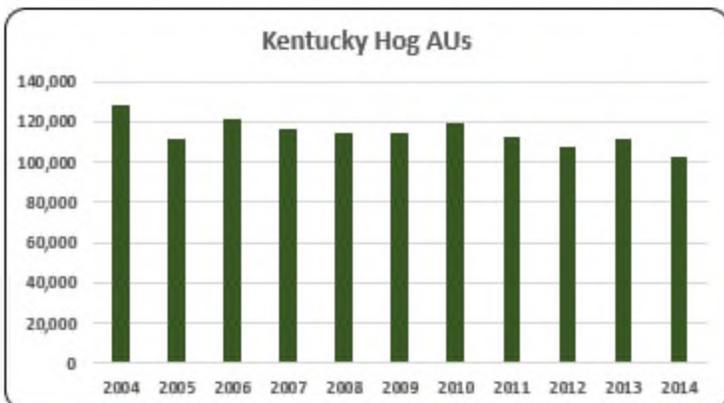
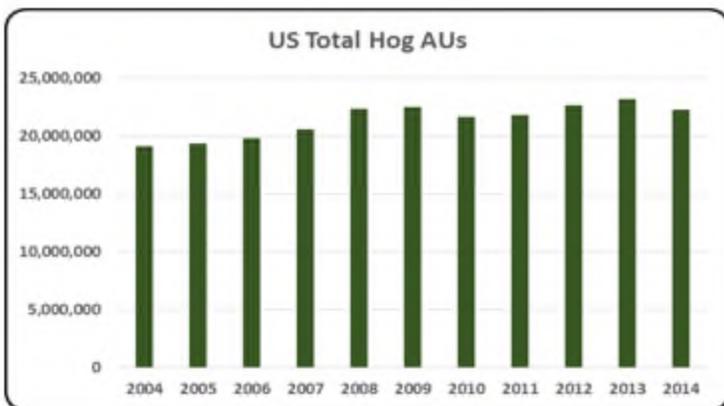
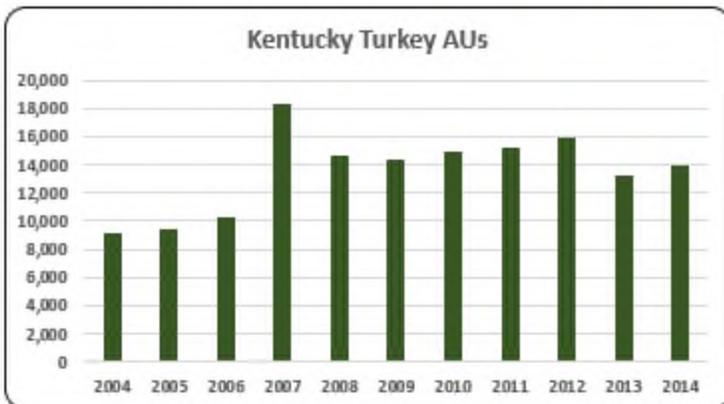
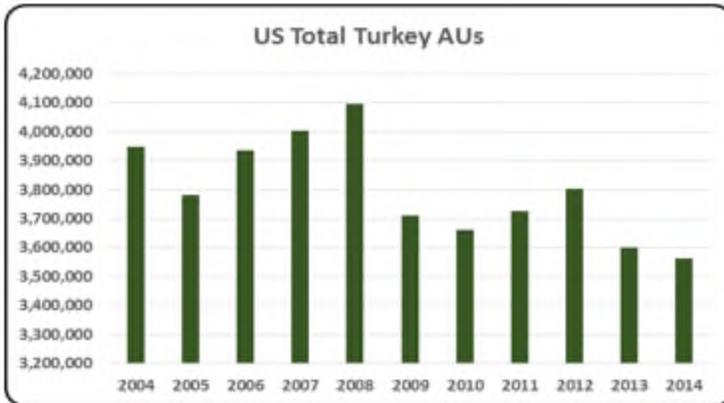
- There were 925,704 broiler AUs in 2014 and even though there was a small decline from the previous year, broiler production in Kentucky increased 8.7% since 2004.



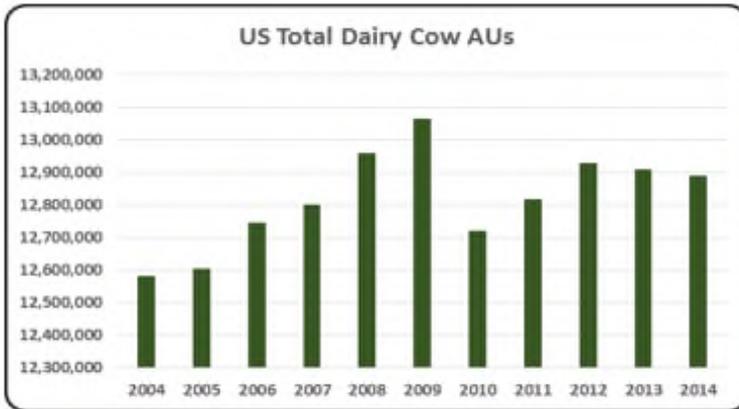
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



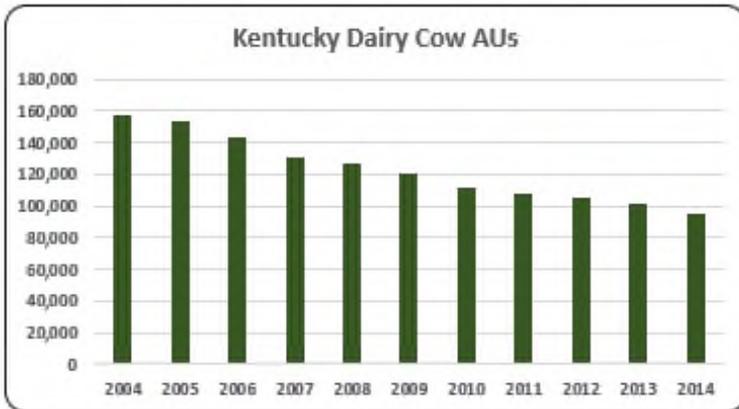
- The layer production has expanded 40% since the beginning of the decade. Layer AUs in 2014 were 11,430 compared to 8,191 in 2004.



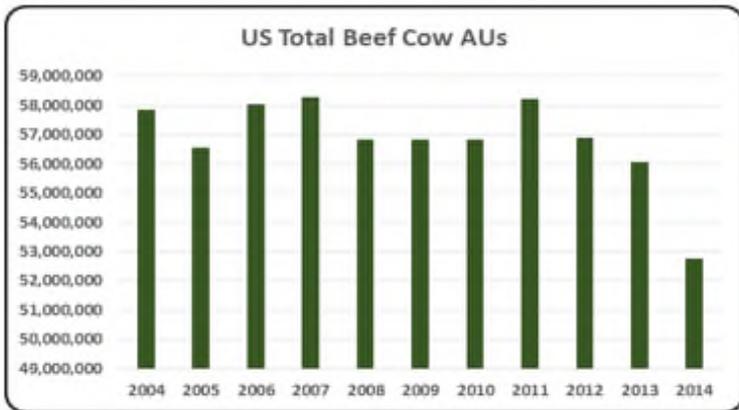
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- For the most part the turkey production in Kentucky has expanded during the decade growing 51% from 9,189 turkey AUs in 2004 to 13,882 turkey AUs in 2014.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog AUs dropped 7% year-over-year and 20% from the numbers in 2004 (128,550). There were a total of 102,900 hog AUs in 2014.



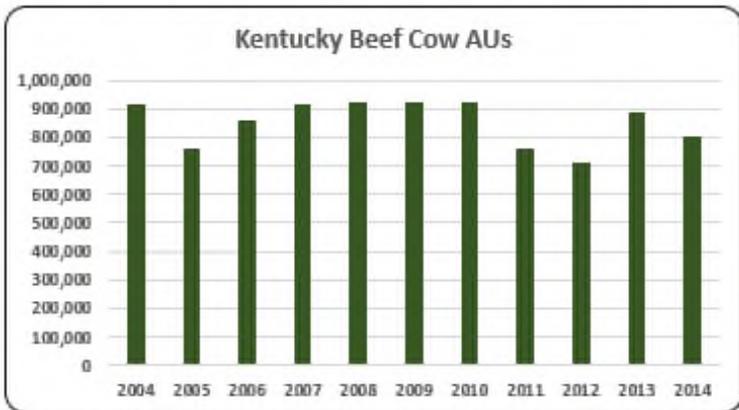
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Kentucky’s dairy cow production has been consistently declining from 156,800 dairy cow AUs in 2004 to 95,200 dairy cow AUs in 2014, showing a 39% reduction during the decade.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Forty one percent (801,300) of all AUs in the state of Kentucky were beef cow AUs. Beef cow production diminished in 2011 to 762,150 beef AUs. In 2014 beef cow AUs remained 13% below 2010 levels

Kentucky Additional Information and Methodology

Animal agriculture is an important part of Kentucky's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Kentucky, of interest is the degree to which the industry impacts the Kentucky economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Kentucky animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Kentucky's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Kentucky which have occurred. As shown in this state report, Kentucky has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Kentucky. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Kentucky Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Kentucky's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Kentucky, \$2.081 to \$3.094 million in total economic activity, \$0.360 to \$0.523 in household wages and 11 to 16 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.9349 | \$ 0.4914 | 15.6 |
| | Hogs, Pigs, and Other | \$ 2.0807 | \$ 0.3604 | 11.3 |
| | Poultry and Eggs | \$ 3.0937 | \$ 0.5229 | 14.7 |
| | Dairy | \$ 2.3534 | \$ 0.4203 | 13.3 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 919,050 | 759,600 | 857,700 | 914,250 | 923,700 | 923,700 | 923,700 | 762,150 | 712,500 | 887,550 | 801,300 |
| | Hog and Pig AUs | 128,550 | 111,000 | 121,650 | 116,400 | 114,300 | 114,000 | 119,550 | 112,650 | 107,250 | 111,150 | 102,900 |
| | Broiler AUs | 851,361 | 877,468 | 851,318 | 892,024 | 902,564 | 903,320 | 911,682 | 931,403 | 930,291 | 930,248 | 925,704 |
| | Turkey AUs | 9,189 | 9,424 | 10,240 | 18,330 | 14,651 | 14,352 | 14,949 | 15,215 | 15,935 | 13,292 | 13,882 |
| | Egg Layer AUs | 8,191 | 9,021 | 8,705 | 11,496 | 11,168 | 9,768 | 9,703 | 9,761 | 11,079 | 11,251 | 11,430 |
| | Dairy AUs | 156,800 | 154,000 | 142,800 | 130,200 | 127,400 | 120,400 | 112,000 | 107,800 | 105,000 | 100,800 | 95,200 |
| | Total Animal Units | 2,073,141 | 1,920,513 | 1,992,412 | 2,082,700 | 2,093,783 | 2,085,540 | 2,091,584 | 1,938,979 | 1,882,055 | 2,054,291 | 1,950,417 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 554,972 | \$ 610,926 | \$ 657,078 | \$ 570,235 | \$ 507,540 | \$ 476,884 | \$ 563,075 | \$ 585,804 | \$ 736,272 | \$ 670,516 | \$ 962,296 |
| | Hogs and Pigs (\$1,000) | \$ 97,373 | \$ 81,092 | \$ 79,987 | \$ 83,889 | \$ 76,419 | \$ 66,990 | \$ 101,443 | \$ 115,178 | \$ 105,609 | \$ 115,851 | \$ 128,686 |
| | Broilers (\$1,000) | \$ 690,932 | \$ 704,297 | \$ 572,220 | \$ 717,326 | \$ 760,334 | \$ 757,615 | \$ 806,338 | \$ 782,595 | \$ 866,600 | \$ 1,014,479 | \$ 1,098,698 |
| | Turkeys (\$1,000) | \$ 8,526 | \$ 9,041 | \$ 10,685 | \$ 21,139 | \$ 19,789 | \$ 13,271 | \$ 17,780 | \$ 19,941 | \$ 23,110 | \$ 15,219 | \$ 25,481 |
| | Eggs (\$1,000) | \$ 88,099 | \$ 72,568 | \$ 73,156 | \$ 120,075 | \$ 130,387 | \$ 110,285 | \$ 101,530 | \$ 115,438 | \$ 116,170 | \$ 131,969 | \$ 154,849 |
| | Milk (\$1,000) | \$ 241,740 | \$ 221,454 | \$ 182,420 | \$ 252,500 | \$ 242,000 | \$ 168,072 | \$ 206,208 | \$ 235,440 | \$ 221,760 | \$ 230,050 | \$ 258,516 |
| | Other | \$ 4,279 | \$ 4,461 | \$ 4,236 | \$ 4,504 | \$ 4,532 | \$ 4,612 | \$ 4,775 | \$ 4,784 | \$ 4,858 | \$ 4,933 | \$ 5,007 |
| | Sheep and Lambs (\$1,000) | \$ 1,882 | \$ 2,120 | \$ 1,951 | \$ 2,275 | \$ 2,359 | \$ 2,495 | \$ 2,714 | \$ 2,779 | \$ 2,909 | \$ 3,040 | \$ 3,170 |
| | Aquaculture (\$1,000) | \$ 2,397 | \$ 2,341 | \$ 2,285 | \$ 2,229 | \$ 2,173 | \$ 2,117 | \$ 2,061 | \$ 2,005 | \$ 1,949 | \$ 1,893 | \$ 1,837 |
| | Total (\$1,000) | \$ 1,685,921 | \$ 1,703,839 | \$ 1,579,782 | \$ 1,769,668 | \$ 1,741,001 | \$ 1,597,729 | \$ 1,801,149 | \$ 1,859,180 | \$ 2,074,379 | \$ 2,183,016 | \$ 2,633,533 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|------------------|------------------|------------------|------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 24,962 | 31,035 | 33,966 | 30,041 | |
| | Cattle feedlots (112112) | 877 | 1,820 | 1,073 | 541 | |
| | Dairy cattle and milk production (11212) | 2,010 | 2,078 | 1,641 | 890 | |
| | Hog and pig farming (1122) | 588 | 366 | 354 | 262 | |
| | Poultry and egg production (1123) | 418 | 904 | 1,593 | 1,603 | |
| | Sheep and goat farming (1124) | 269 | 901 | 2,038 | 1,746 | |
| | Animal aquaculture and other animal production (1125,1129) | 3,495 | 7,309 | 9,351 | 7,826 | |
| Value of Sales (\$1,000) | Cattle and Calves | 570,377 | 622,855 | 935,611 | 1,033,722 | |
| | Hogs and Pigs | 119,651 | 69,722 | 90,198 | 122,130 | |
| | Poultry and Eggs | 273,284 | 561,178 | 978,025 | 1,107,452 | |
| | Milk and Other Dairy Products | 237,734 | 214,365 | 250,305 | 207,602 | |
| | Aquaculture | 1,628 | 2,017 | 2,683 | 2,884 | |
| | Other (calculated) | 345,173 | 499,734 | 1,162,970 | 134,038 | |
| | Total | 1,547,847 | 1,969,871 | 3,419,792 | 2,607,828 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 19,647 | 21,156 | 18,470 | 21,345 |
| | | \$1,000 | 236,935 | 298,839 | 523,127 | 598,201 |
| | Breeding livestock purchased | (Farms) | n/a | 13,530 | 11,737 | 13,387 |
| | | \$1,000 | n/a | 71,492 | 171,651 | 124,223 |
| | Other livestock and poultry purchased | (Farms) | n/a | 9,936 | 9,159 | 11,237 |
| | | \$1,000 | n/a | 227,347 | 351,475 | 473,978 |
| | Feed purchased | (Farms) | 39,926 | 51,368 | 46,766 | 50,685 |
| | | \$1,000 | 341,123 | 443,883 | 793,669 | 1,176,273 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|---------------------|---------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 2,824,243 | \$ 472,872 | 15,031 | \$ 123,562 |
| | Hogs, Pigs, and Other | \$ 278,175 | \$ 48,183 | 1,513 | \$ 12,590 |
| | Poultry and Eggs | \$ 3,956,930 | \$ 668,804 | 18,857 | \$ 174,758 |
| | Dairy | \$ 608,392 | \$ 108,654 | 3,449 | \$ 28,391 |
| | Total | \$ 7,667,739 | \$ 1,298,513 | 38,850 | \$ 339,302 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 782,990 | \$ 131,099 | 4,167 | \$ 34,256 |
| | Hogs, Pigs, and Other | \$ 13,107 | \$ 2,270 | 71 | \$ 593 |
| | Poultry and Eggs | \$ 903,468 | \$ 152,705 | 4,306 | \$ 39,902 |
| | Dairy | \$ (104,587) | \$ (18,679) | (593) | \$ (4,881) |
| | Total | \$ 1,594,978 | \$ 267,395 | 7,951 | \$ 69,870 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.9349 | \$ 0.4914 | 15.6 | |
| | Hogs, Pigs, and Other | \$ 2.0807 | \$ 0.3604 | 11.3 | |
| | Poultry and Eggs | \$ 3.0937 | \$ 0.5229 | 14.7 | |
| | Dairy | \$ 2.3534 | \$ 0.4203 | 13.3 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 5.8% |
| | Total | | | | 26.1% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: LOUISIANA

Louisiana Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Louisiana's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key factor in animal agriculture's success in Louisiana. In the state of Louisiana during 2014 animal agriculture contributed:

- \$1.4 billion in economic output
- 8,446 jobs
- \$240.3 million in earnings
- \$58.5 million in income taxes paid at local, state, and federal levels
- \$32.1 million in the form of property taxes

Louisiana's animal agriculture consumed about 255.5 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (230.0 thousand tons)
- Beef Cows (6.2 thousand tons)
- Egg-Laying Hens (6.1 thousand tons)

This report examines animal agriculture in Louisiana over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Louisiana, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of Louisiana.

Louisiana Economic Impact of Animal Agriculture

Animal agriculture is an important but shrinking part of Louisiana's economy. In 2014, Louisiana's animal agriculture contributed the following to the economy:

- About \$1.4 billion in economic output
- \$240.3 million in household earnings
- 8,446 jobs
- \$58.5 million in income taxes

During the last decade contractions in Louisiana's animal agriculture have:

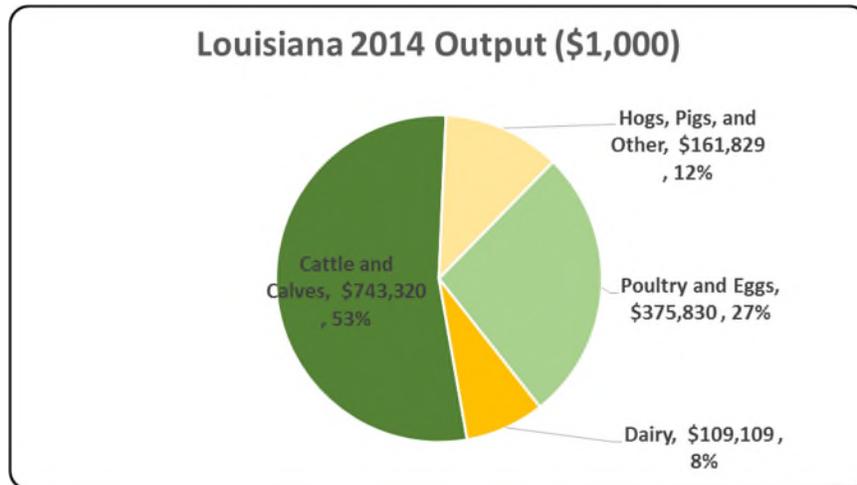
- Decreased economic output by \$293.9 million
- Reduced household earnings by \$53.1 million
- Shrunk by 1,694 jobs
- Paid \$12.9 million less in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 1,390,087 | \$ (293,921) | -17.45% |
| Earnings (\$1,000) | \$ 240,277 | \$ (53,058) | -18.09% |
| Employment (Jobs) | 8,446 | (1,694) | -16.71% |
| Income Taxes Paid (\$1,000) | \$ 58,459 | \$ (12,909) | -18.09% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 32,101 | | |

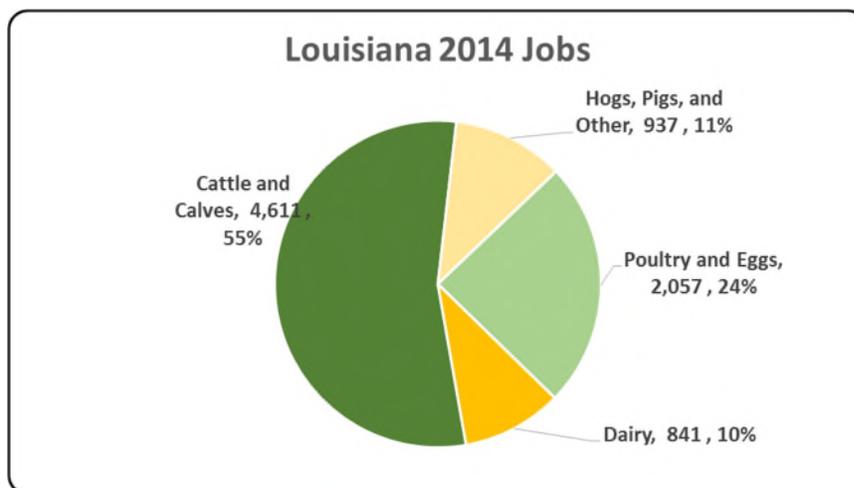
Louisiana Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Louisiana economy. Animal agriculture’s impact on Louisiana total economic output is about \$1.4 billion.



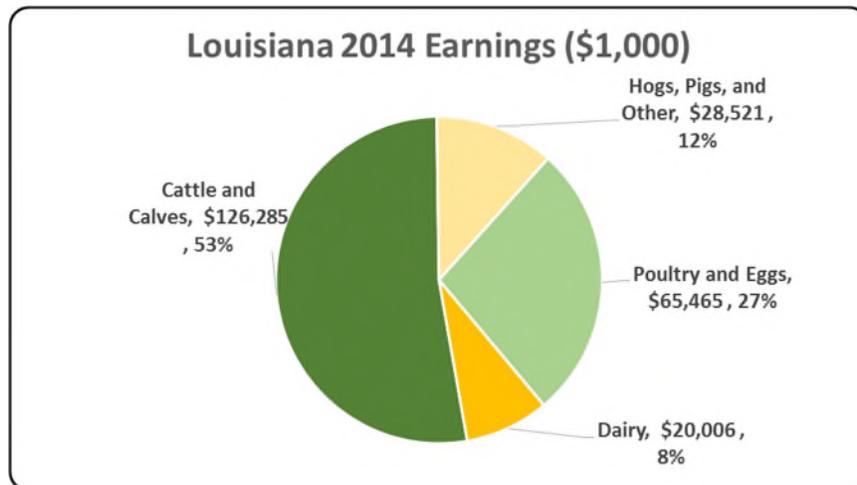
Louisiana Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Louisiana in terms of animal agriculture jobs. As shown, animal agriculture contributes about 8,446 jobs within and outside of animal agriculture.



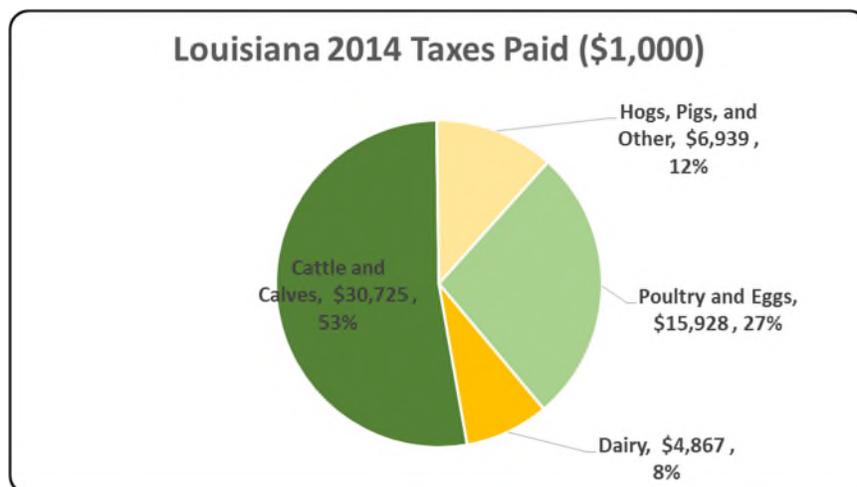
Louisiana Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Louisiana economy in terms of earnings. Louisiana’s animal agriculture contributed about \$240.3 million to household earnings in 2014.



Louisiana Taxes Paid by Animal Agriculture

Louisiana’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$58.5 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$32.1 million in property taxes paid by all of Louisiana agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



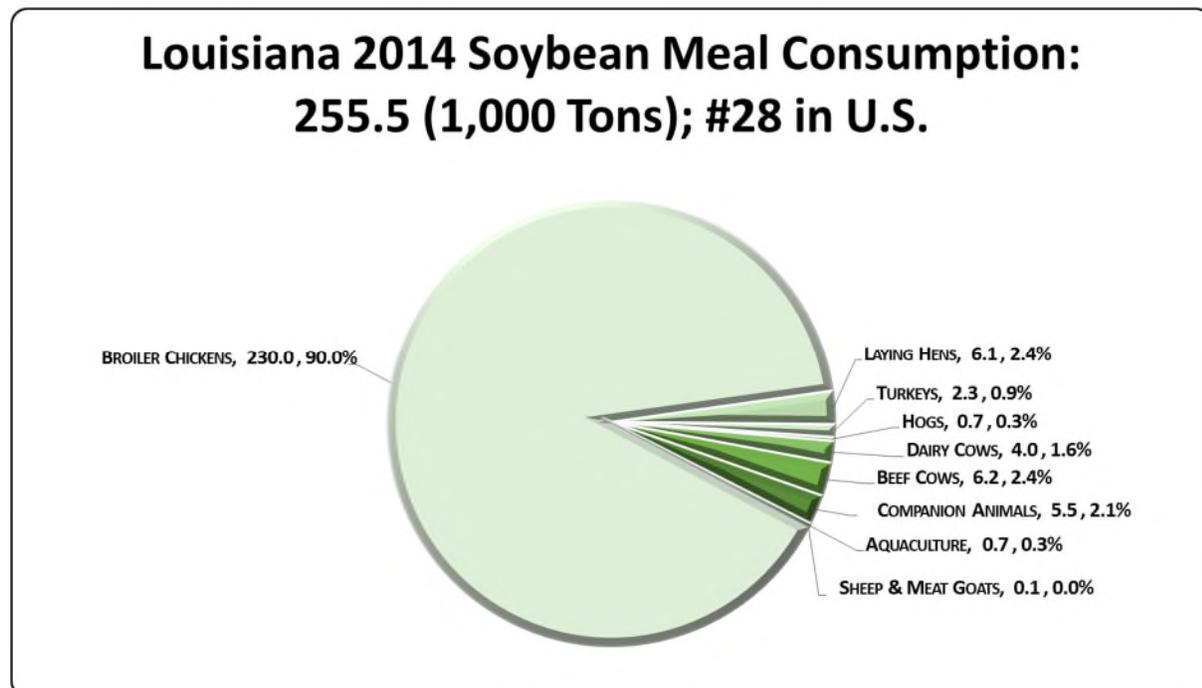
Louisiana Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Louisiana's animal agriculture consumed almost 255.5 thousand tons of soybean meal in 2014, placing the state as #28 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (230.0 thousand tons)
- Beef Cows (6.2 thousand tons)
- Egg-Laying Hens (6.1 thousand tons)

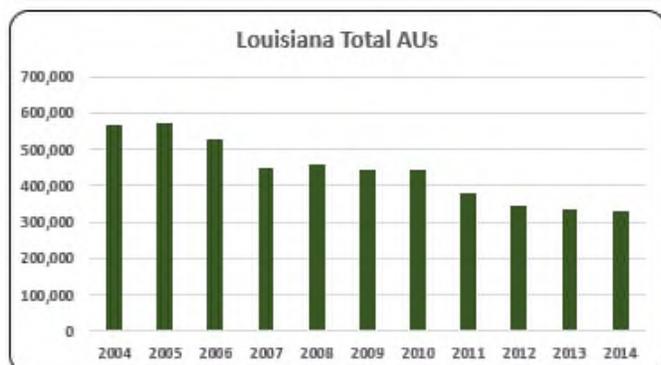
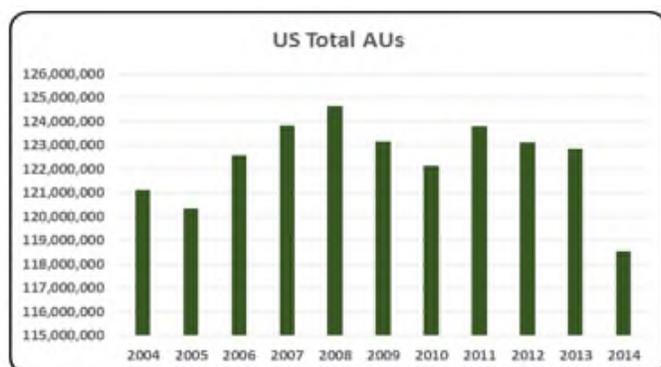


Louisiana Animal Unit (AU) Trends

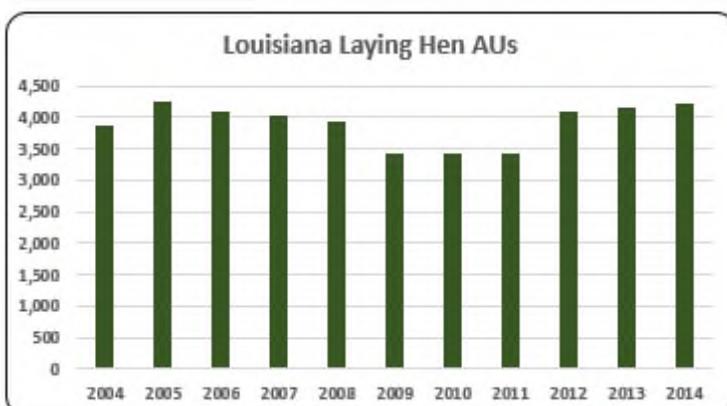
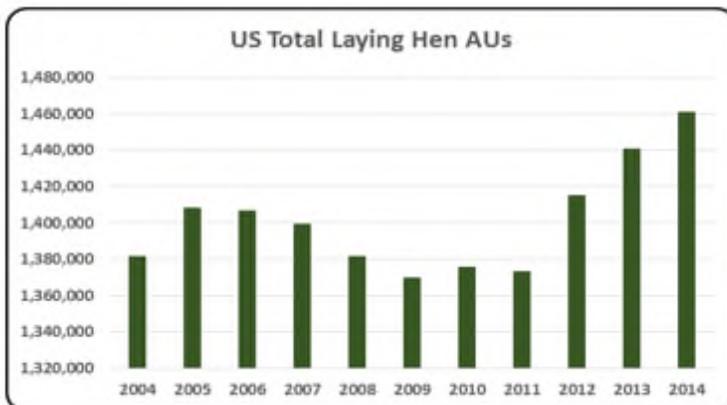
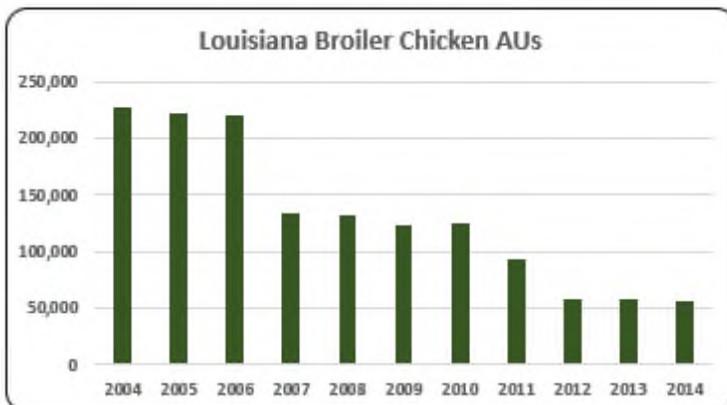
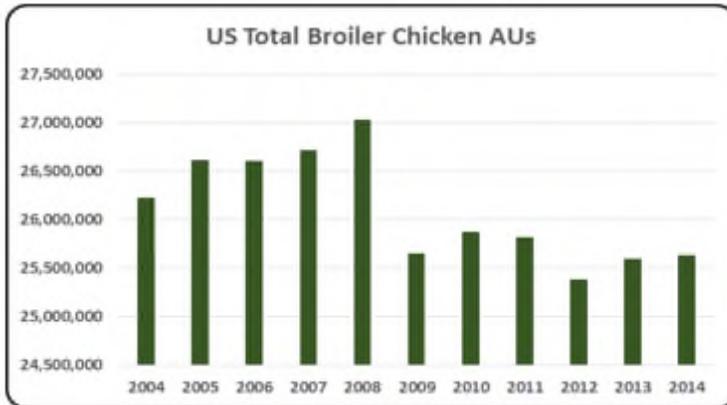
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Louisiana. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Louisiana and to give perspective on Louisiana's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

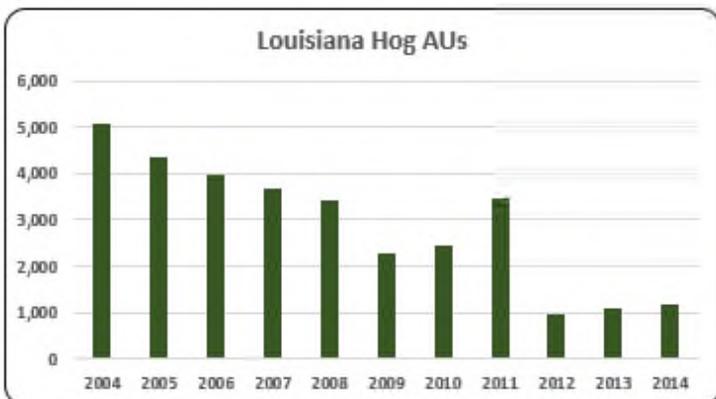
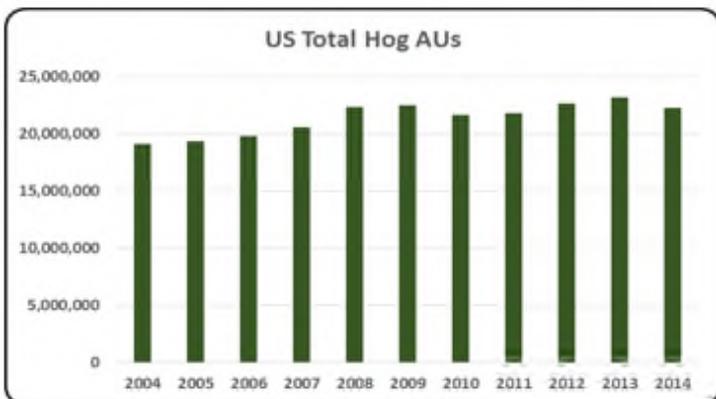
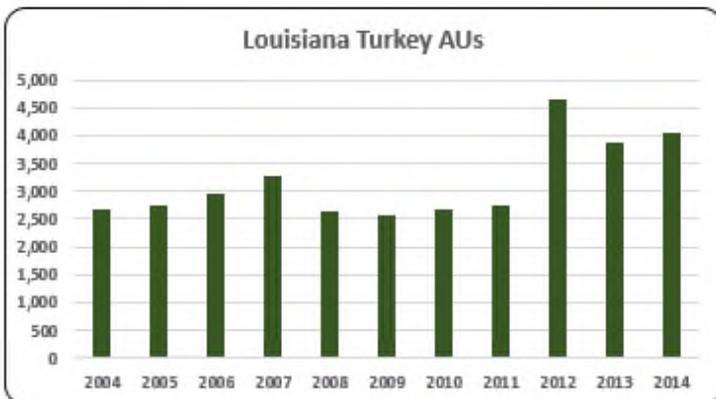
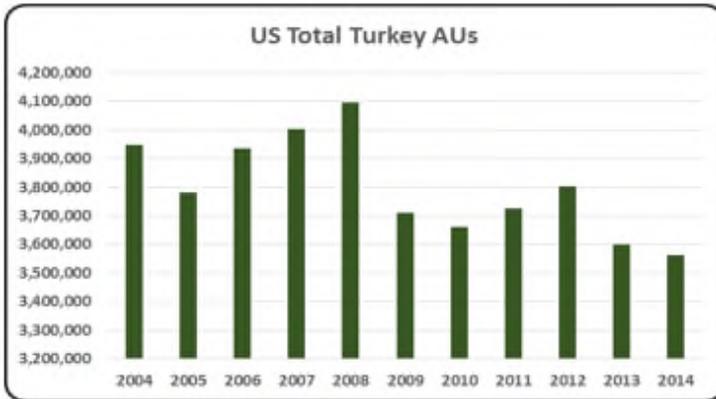
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Louisiana, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (245.0 thousand AUs), Broilers (56.8 thousand AUs), and Dairy Cows (21.0 thousand AUs). Total animal units in Louisiana during 2014 were 332.2 thousand AUs.



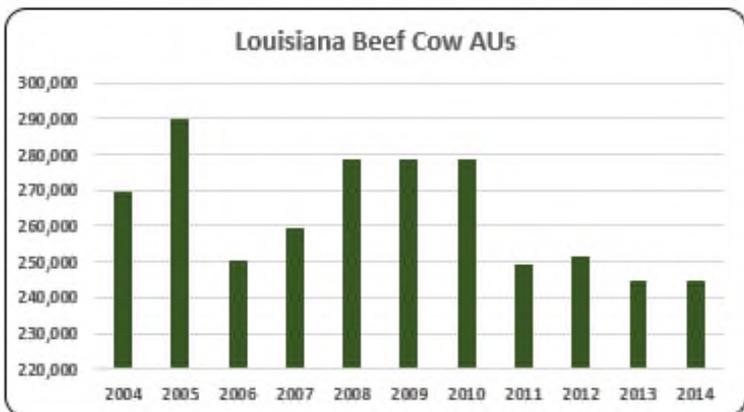
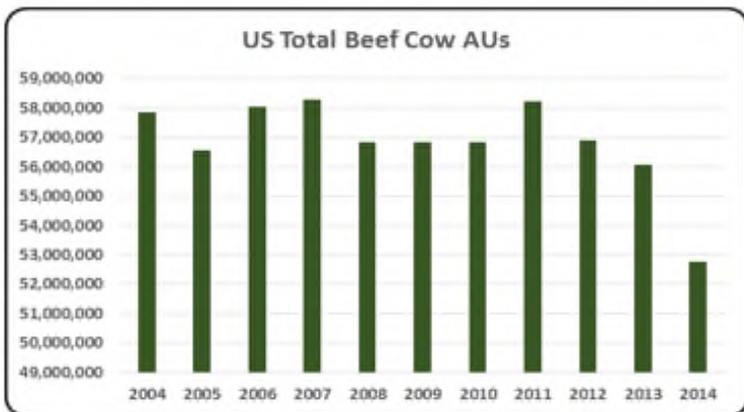
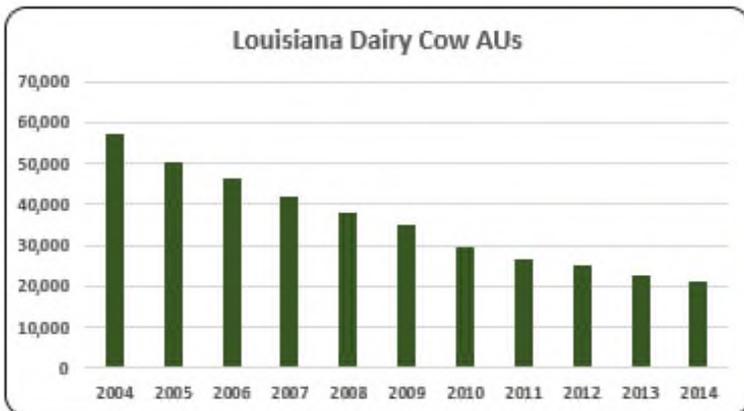
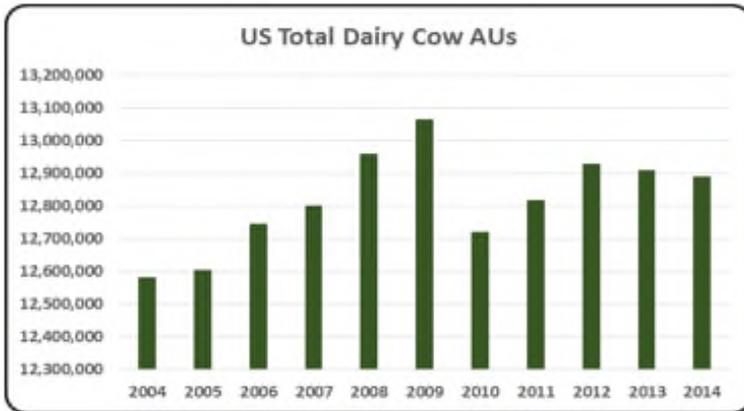
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- The most important animal production in Louisiana is beef cow production. About 74% (244,950) of all AUs (332,163) in Louisiana in 2014 were beef cow AUs. Beef cow production has plummeted 9.0% since 2004 (269,700).



- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production in Louisiana has substantially decreased from 226,591 broiler AUs in 2004 to 56,757 in 2014, showing a 75% reduction.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layers numbers dropped during 2009-2011 to an average of 3,422 layer AUs. By 2014, there were 4,210 layer AUs increasing 1.6% from the previous year.



- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- There was a 1.6% increase in the number of layer AUs in 2014 relative to 2013.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production in Louisiana is the smallest animal production in the state. Hog AUs decreased 77% since the beginning of the decade. There were 1,185 hog AUs in 2014.



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.
- Over 6.0% of all AU in Louisiana were dairy cow AUs which is the third most important animal production in the state; however the production of dairy cows fell 63% from 2004 to 2014.
- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.
- Beef cow production has plummeted 9.0% since 2004 (269,700). There were 244,950 beef cow AUs in 2014.

Louisiana Additional Information and Methodology

Animal agriculture is an important part of Louisiana's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Louisiana, of interest is the degree to which the industry impacts the Louisiana economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Louisiana animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Louisiana's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Louisiana which have occurred. As shown in this state report, Louisiana has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Louisiana. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Louisiana Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Louisiana's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Louisiana, \$1.787 to \$2.453 million in total economic activity, \$0.315 to \$0.427 in household wages and 10 to 16 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.0813 | \$ 0.3536 | 12.9 |
| | Hogs, Pigs, and Other | \$ 1.7873 | \$ 0.3150 | 10.3 |
| | Poultry and Eggs | \$ 2.4531 | \$ 0.4273 | 13.4 |
| | Dairy | \$ 2.0414 | \$ 0.3743 | 15.7 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Animal Units (AUs) | Beef Cattle AUs | 269,700 | 289,800 | 250,650 | 259,200 | 278,850 | 278,850 | 278,850 | 249,150 | 251,250 | 244,650 | 244,950 |
| | Hog and Pig AUs | 5,085 | 4,335 | 3,975 | 3,675 | 3,405 | 2,265 | 2,445 | 3,450 | 960 | 1,080 | 1,185 |
| | Broiler AUs | 226,591 | 221,821 | 220,324 | 134,153 | 132,061 | 122,785 | 124,437 | 93,764 | 57,281 | 57,081 | 56,757 |
| | Turkey AUs | 2,660 | 2,728 | 2,964 | 3,290 | 2,630 | 2,576 | 2,683 | 2,731 | 4,661 | 3,888 | 4,061 |
| | Egg Layer AUs | 3,855 | 4,246 | 4,097 | 4,037 | 3,922 | 3,430 | 3,408 | 3,428 | 4,081 | 4,144 | 4,210 |
| | Dairy AUs | 57,400 | 50,400 | 46,200 | 42,000 | 37,800 | 35,000 | 29,400 | 26,600 | 25,200 | 22,400 | 21,000 |
| | Total Animal Units | 565,290 | 573,330 | 528,210 | 446,355 | 458,667 | 444,907 | 441,223 | 379,123 | 343,434 | 333,244 | 332,163 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 208,754 | \$ 213,324 | \$ 214,148 | \$ 208,881 | \$ 189,780 | \$ 170,208 | \$ 171,121 | \$ 225,510 | \$ 262,296 | \$ 254,357 | \$ 357,142 |
| | Hogs and Pigs (\$1,000) | \$ 2,852 | \$ 2,567 | \$ 1,969 | \$ 1,671 | \$ 1,817 | \$ 975 | \$ 1,426 | \$ 2,770 | \$ 862 | \$ 1,015 | \$ 1,239 |
| | Broilers (\$1,000) | \$ 190,582 | \$ 180,528 | \$ 139,509 | \$ 100,921 | \$ 103,865 | \$ 89,968 | \$ 94,695 | \$ 83,432 | \$ 57,062 | \$ 69,516 | \$ 72,925 |
| | Turkeys (\$1,000) | \$ 2,468 | \$ 2,617 | \$ 3,093 | \$ 3,794 | \$ 3,552 | \$ 2,382 | \$ 3,191 | \$ 3,579 | \$ 6,760 | \$ 4,452 | \$ 7,454 |
| | Eggs (\$1,000) | \$ 34,966 | \$ 31,073 | \$ 31,011 | \$ 42,333 | \$ 47,694 | \$ 38,009 | \$ 46,210 | \$ 55,356 | \$ 58,699 | \$ 62,904 | \$ 72,828 |
| | Milk (\$1,000) | \$ 79,035 | \$ 68,138 | \$ 57,024 | \$ 70,498 | \$ 66,033 | \$ 38,482 | \$ 42,300 | \$ 50,808 | \$ 43,512 | \$ 45,114 | \$ 53,448 |
| | Other | \$ 102,648 | \$ 101,314 | \$ 99,980 | \$ 98,645 | \$ 97,311 | \$ 95,977 | \$ 94,642 | \$ 93,308 | \$ 91,973 | \$ 90,639 | \$ 89,305 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 102,648 | \$ 101,314 | \$ 99,980 | \$ 98,645 | \$ 97,311 | \$ 95,977 | \$ 94,642 | \$ 93,308 | \$ 91,973 | \$ 90,639 | \$ 89,305 |
| | Total (\$1,000) | \$ 621,306 | \$ 599,561 | \$ 546,733 | \$ 526,743 | \$ 510,051 | \$ 436,001 | \$ 453,586 | \$ 514,763 | \$ 521,165 | \$ 527,997 | \$ 654,340 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|----------------|----------------|------------------|----------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 12,003 | 12,715 | 11,775 | 11,218 | |
| | Cattle feedlots (112112) | 209 | 12 | - | 28 | |
| | Dairy cattle and milk production (11212) | 602 | 143 | 282 | 111 | |
| | Hog and pig farming (1122) | 196 | 237 | 232 | 202 | |
| | Poultry and egg production (1123) | 476 | 815 | 808 | 717 | |
| | Sheep and goat farming (1124) | 166 | 256 | 627 | 607 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,606 | 3,334 | 4,699 | 4,116 | |
| Value of Sales (\$1,000) | Cattle and Calves | 152,202 | 170,569 | 223,922 | 249,963 | |
| | Hogs and Pigs | 4,093 | withheld | 1,235 | - | |
| | Poultry and Eggs | 323,274 | 417,755 | 575,989 | 574,239 | |
| | Milk and Other Dairy Products | 109,332 | 82,866 | 72,020 | 42,628 | |
| | Aquaculture | 53,220 | 41,285 | 109,138 | 122,989 | |
| | Other (calculated) | 42,716 | 37,717 | 31,030 | - | |
| | Total | 684,837 | 750,192 | 1,013,334 | 989,819 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 6,487 | 6,664 | 5,909 | 6,651 |
| | | \$1,000 | 73,786 | 89,122 | 120,621 | 134,875 |
| | Breeding livestock purchased | (Farms) | n/a | 4,440 | 3,899 | 4,314 |
| | | \$1,000 | n/a | 13,593 | 27,852 | 42,909 |
| | Other livestock and poultry purchased | (Farms) | n/a | 3,140 | 2,804 | 3,282 |
| | | \$1,000 | n/a | 75,529 | 92,769 | 91,965 |
| Feed purchased | (Farms) | 13,261 | 17,496 | 16,578 | 18,356 | |
| | \$1,000 | 247,019 | 260,900 | 369,975 | 452,403 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 743,320 | \$ 126,285 | 4,611 | \$ 30,725 |
| | Hogs, Pigs, and Other | \$ 161,829 | \$ 28,521 | 937 | \$ 6,939 |
| | Poultry and Eggs | \$ 375,830 | \$ 65,465 | 2,057 | \$ 15,928 |
| | Dairy | \$ 109,109 | \$ 20,006 | 841 | \$ 4,867 |
| | Total | \$ 1,390,087 | \$ 240,277 | 8,446 | \$ 58,459 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 198,815 | \$ 33,777 | 1,233 | \$ 8,218 |
| | Hogs, Pigs, and Other | \$ (74,482) | \$ (13,127) | (431) | \$ (3,194) |
| | Poultry and Eggs | \$ (325,162) | \$ (56,639) | (1,779) | \$ (13,780) |
| | Dairy | \$ (93,091) | \$ (17,069) | (717) | \$ (4,153) |
| | Total | \$ (293,921) | \$ (53,058) | (1,694) | \$ (12,909) |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.0813 | \$ 0.3536 | 12.9 | |
| | Hogs, Pigs, and Other | \$ 1.7873 | \$ 0.3150 | 10.3 | |
| | Poultry and Eggs | \$ 2.4531 | \$ 0.4273 | 13.4 | |
| | Dairy | \$ 2.0414 | \$ 0.3743 | 15.7 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 4.0% | |
| | Total | | | 24.3% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: MAINE

Maine Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Maine's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Maine. The success of Maine animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Maine during 2014 animal agriculture contributed:

- \$865.6 million in economic output
- 5,936 jobs
- \$153.3 million in earnings
- \$43.4 million in income taxes paid at local, state, and federal levels
- \$30.7 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Maine increased economic output by over \$179.6 million, boosted household earnings by \$31.7 million, contributed 1,217 additional jobs and paid \$9.0 million in additional tax revenues.

Maine's animal agriculture consumed about 42.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Egg-Laying Hens (22.2 thousand tons)
- Turkeys (12.6 thousand tons)
- Dairy Cows (5.1 thousand tons)

This report examines animal agriculture in Maine over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Maine, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Maine and beyond.

Maine Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Maine's economy. In 2014, Maine's animal agriculture contributed the following to the economy:

- About \$865.6 million in economic output
- \$153.3 million in household earnings
- 5,936 jobs
- \$43.4 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Maine's animal agriculture has:

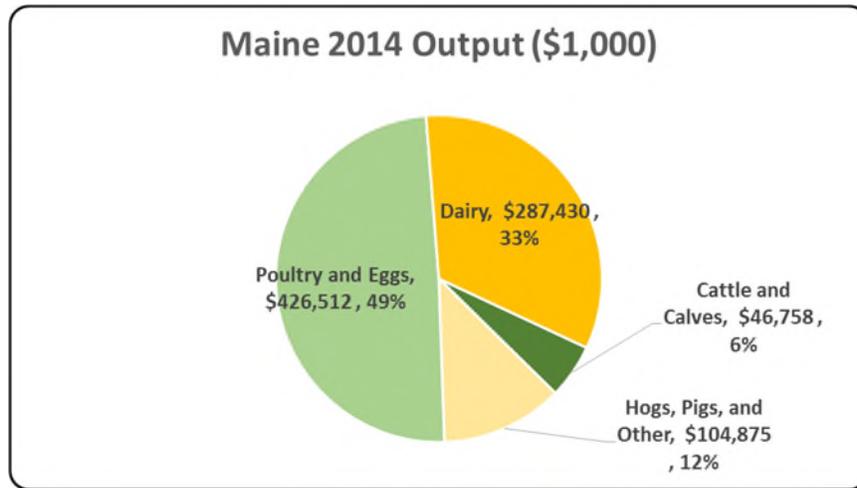
- Increased economic output by \$179.6 million
- Boosted household earnings by \$31.7 million
- Added 1,217 jobs
- Paid an additional \$9.0 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|------------|------------------|--------------------|
| Output (\$1,000) | \$ 865,575 | \$ 179,551 | 26.17% |
| Earnings (\$1,000) | \$ 153,308 | \$ 31,718 | 26.09% |
| Employment (Jobs) | 5,936 | 1,217 | 25.80% |
| Income Taxes Paid (\$1,000) | \$ 43,355 | \$ 8,970 | 26.09% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 30,735 | | |

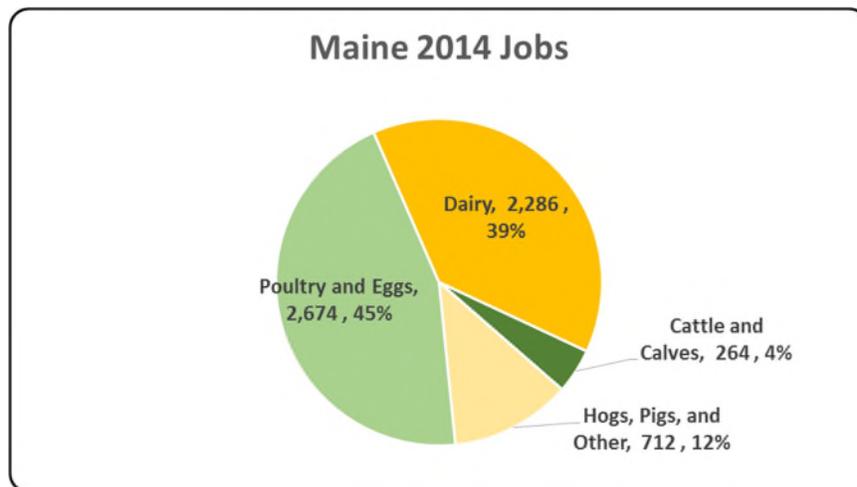
Maine Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Maine economy. Animal agriculture’s impact on Maine total economic output is about \$865.6 million.



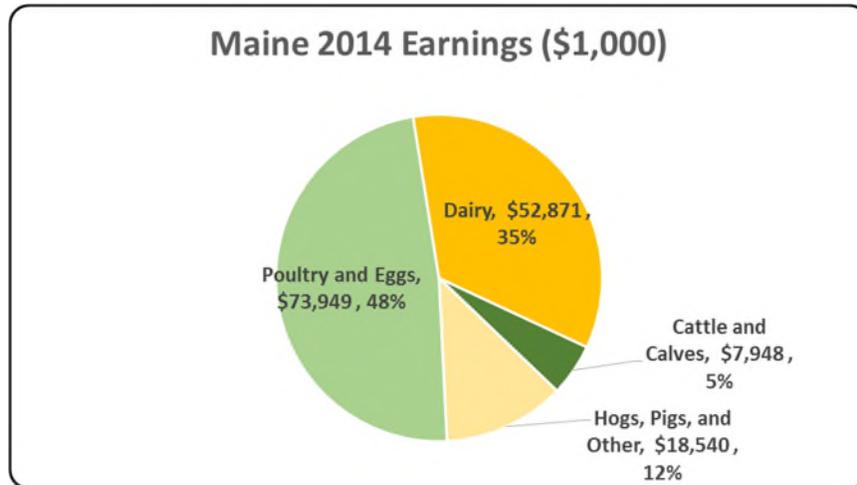
Maine Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Maine in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Maine total jobs, contributing 5,936 jobs within and outside of animal agriculture.



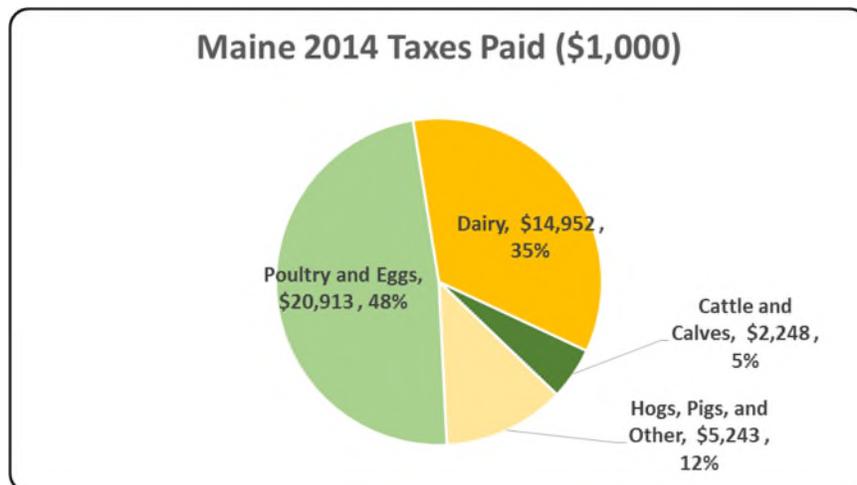
Maine Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Maine economy in terms of earnings. Maine’s animal agriculture contributed about \$153.3 million to household earnings in 2014.



Maine Taxes Paid by Animal Agriculture

Maine’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$43.4 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$30.7 million in property taxes paid by all of Maine agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



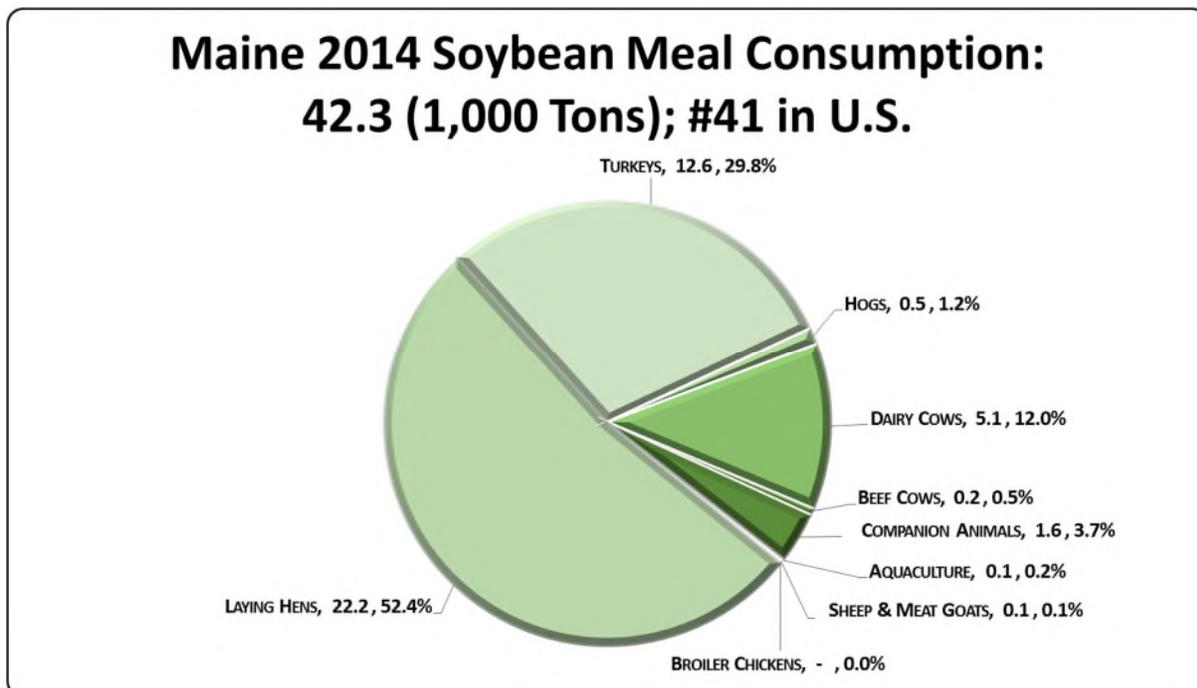
Maine Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Maine's animal agriculture consumed almost 42.3 thousand tons of soybean meal in 2014, placing the state as #41 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Egg-Laying Hens (22.2 thousand tons)
- Turkeys (12.6 thousand tons)
- Dairy Cows (5.1 thousand tons)

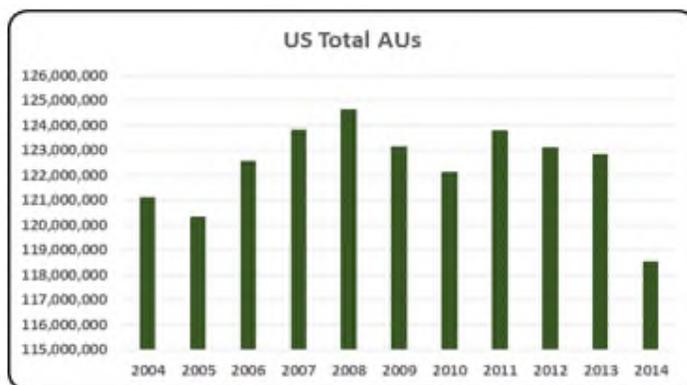


Maine Animal Unit (AU) Trends

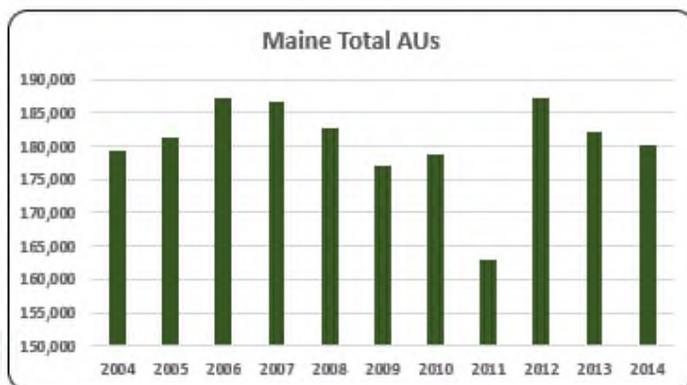
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Maine. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Maine and to give perspective on Maine’s contribution to the nation’s animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

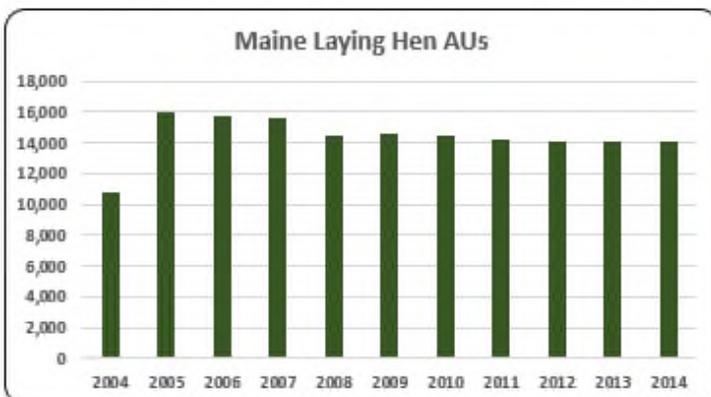
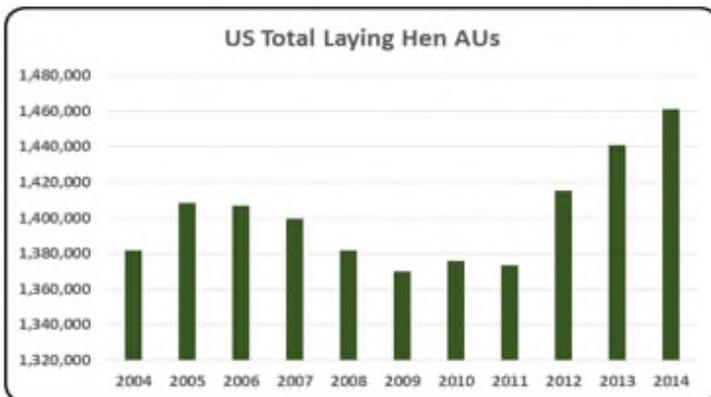
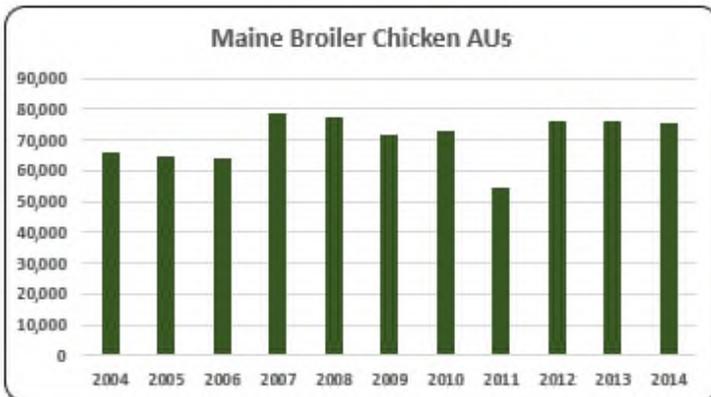
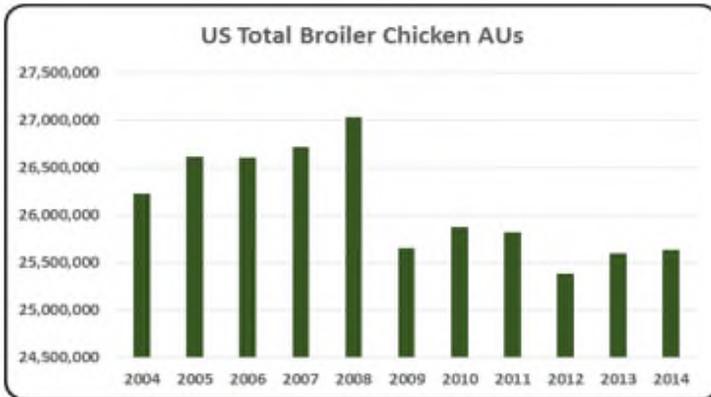
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Maine, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (75.4 thousand AUs), Dairy Cows (42.0 thousand AUs), and Beef Cows (25.1 thousand AUs). Total animal units in Maine during 2014 were 180.1 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- There were 180,096 broiler AUs in 2014 representing 0.15% of all AUs in the country.

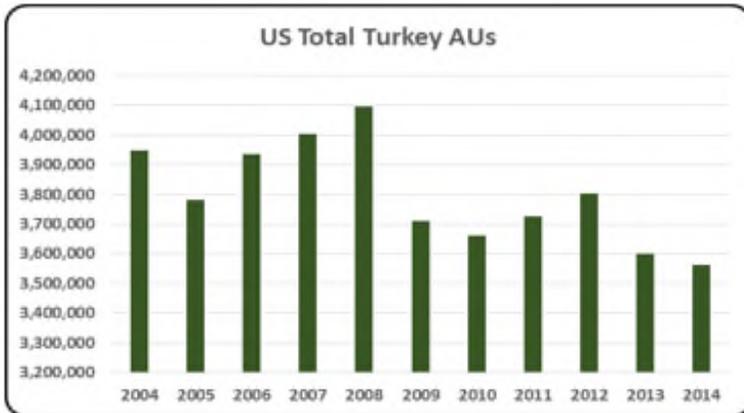


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

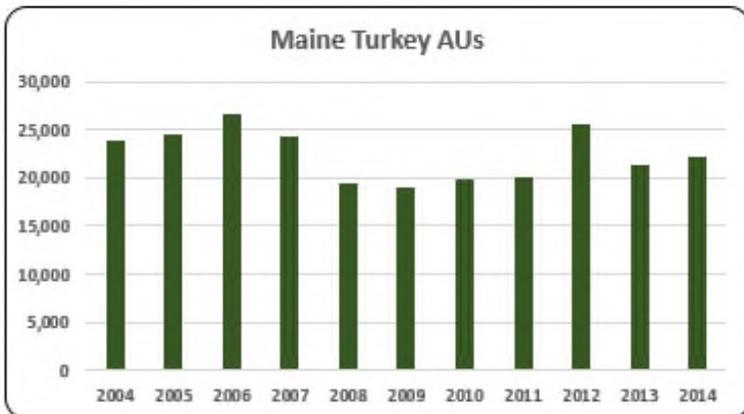
- About 42.0% (75,375) of all AUs in Maine were broiler AUs in 2014. This is the largest animal production in the state. Broiler production has boosted 14% since 2004.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

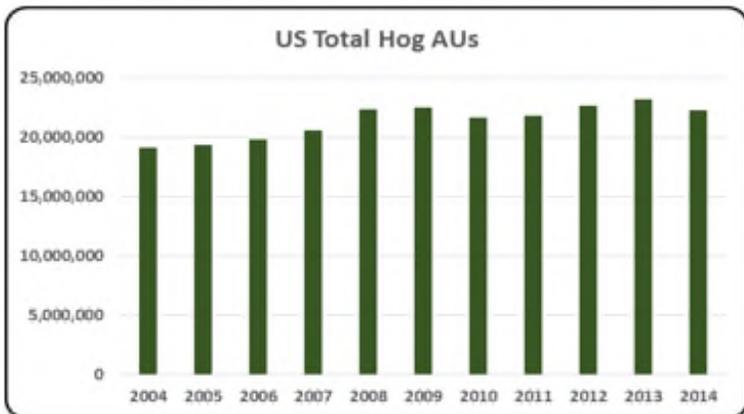
- The average number of layer AUs in Maine during 2004-2014 was 14,377 layer AUs. Layer production has grown 31% through the decade.



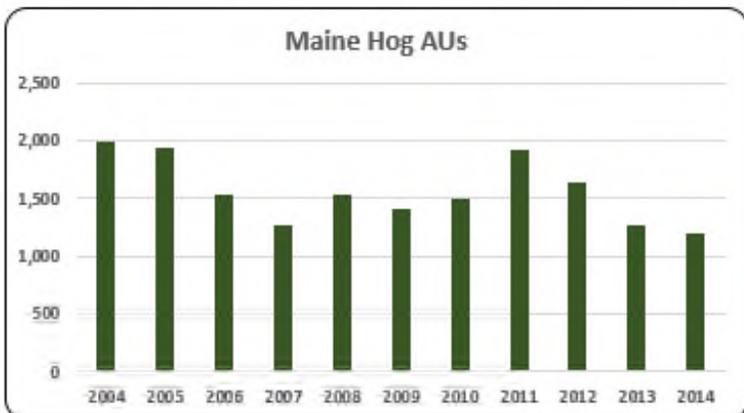
- From 2004 to 2014, the U.S. accounted for 50% of the world's turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.



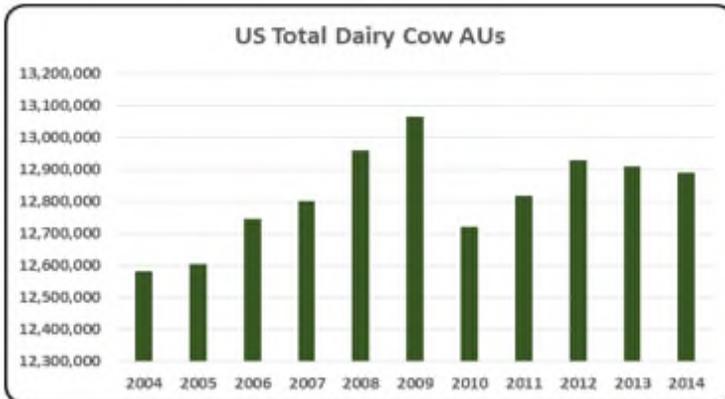
- Turkey production in Maine has varied during the decade; 2014 AUs remained 13% below the most recent record high in 2012 (25,582).



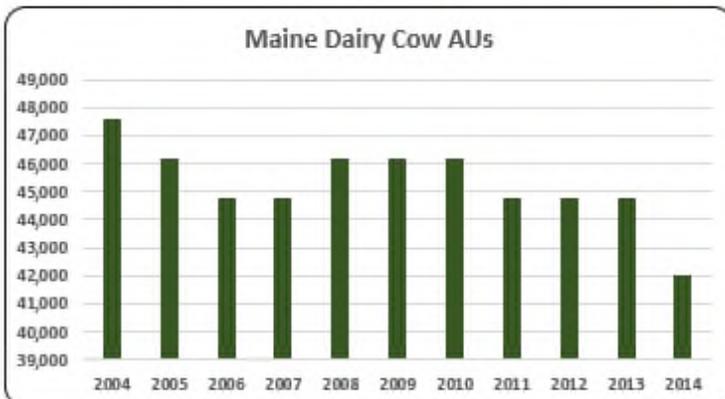
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.



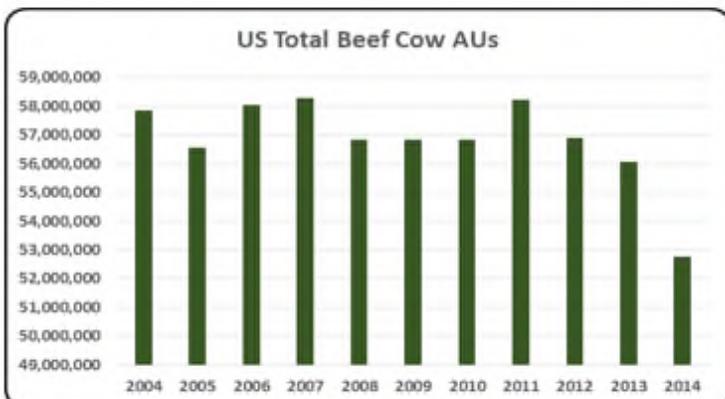
- Hog production in Maine is the smallest animal production in the state representing less than 1% (1,200) of all AUs in the state. Hog production has declined 40% since 2004.



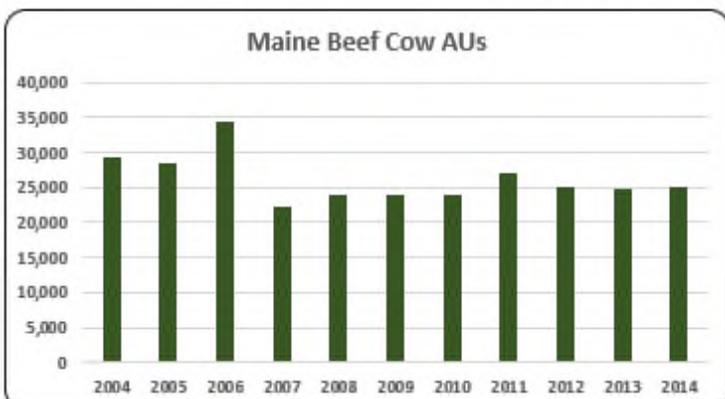
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production in Maine is the second largest animal production in the state with 23.3% (42,000) of all AUs in the state. In 2014, dairy production fell 6.3% year-over-year and 12% compared to the dairy AUs in 2004.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production declined in 2007 to 22,215 AUs. Since then beef cow production has remained flat at about 24,851 AUs. There were 25,110 beef AUs in 2014.

Maine Additional Information and Methodology

Animal agriculture is an important part of Maine's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Maine, of interest is the degree to which the industry impacts the Maine economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Maine animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Maine's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Maine which have occurred. As shown in this state report, Maine has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Maine. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Maine Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Maine's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Maine, \$1.670 to \$1.904 million in total economic activity, \$0.294 to \$0.330 in household wages and 10 to 14 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.7291 | \$ 0.2939 | 9.8 |
| | Hogs, Pigs, and Other | \$ 1.6704 | \$ 0.2953 | 11.3 |
| | Poultry and Eggs | \$ 1.9039 | \$ 0.3301 | 11.9 |
| | Dairy | \$ 1.7875 | \$ 0.3288 | 14.2 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Animal Units (AUs) | Beef Cattle AUs | 29,280 | 28,335 | 34,470 | 22,215 | 23,970 | 23,970 | 23,970 | 27,060 | 24,990 | 24,885 | 25,110 |
| | Hog and Pig AUs | 1,995 | 1,935 | 1,530 | 1,275 | 1,530 | 1,410 | 1,500 | 1,920 | 1,635 | 1,275 | 1,200 |
| | Broiler AUs | 65,939 | 64,551 | 64,115 | 78,401 | 77,178 | 71,758 | 72,723 | 54,797 | 76,071 | 75,805 | 75,375 |
| | Turkey AUs | 23,818 | 24,428 | 26,543 | 24,283 | 19,410 | 19,013 | 19,804 | 20,157 | 25,582 | 21,340 | 22,287 |
| | Egg Layer AUs | 10,748 | 15,960 | 15,776 | 15,552 | 14,404 | 14,608 | 14,456 | 14,264 | 14,133 | 14,124 | 14,123 |
| | Dairy AUs | 47,600 | 46,200 | 44,800 | 44,800 | 46,200 | 46,200 | 46,200 | 44,800 | 44,800 | 44,800 | 42,000 |
| | Total Animal Units | 179,380 | 181,409 | 187,235 | 186,526 | 182,692 | 176,958 | 178,653 | 162,999 | 187,211 | 182,230 | 180,096 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 16,853 | \$ 15,145 | \$ 16,977 | \$ 16,158 | \$ 14,939 | \$ 10,910 | \$ 12,096 | \$ 15,121 | \$ 21,564 | \$ 19,579 | \$ 27,042 |
| | Hogs and Pigs (\$1,000) | \$ 1,455 | \$ 1,455 | \$ 980 | \$ 821 | \$ 995 | \$ 860 | \$ 1,206 | \$ 2,140 | \$ 1,933 | \$ 1,514 | \$ 1,490 |
| | Broilers (\$1,000) | \$ 55,460 | \$ 52,535 | \$ 40,598 | \$ 58,980 | \$ 60,700 | \$ 52,579 | \$ 55,341 | \$ 48,759 | \$ 75,780 | \$ 92,319 | \$ 96,846 |
| | Turkeys (\$1,000) | \$ 22,100 | \$ 23,434 | \$ 27,696 | \$ 28,005 | \$ 26,216 | \$ 17,582 | \$ 23,554 | \$ 26,418 | \$ 37,102 | \$ 24,433 | \$ 40,909 |
| | Eggs (\$1,000) | \$ 70,988 | \$ 46,594 | \$ 51,288 | \$ 80,093 | \$ 104,433 | \$ 63,226 | \$ 57,690 | \$ 64,544 | \$ 69,041 | \$ 72,208 | \$ 86,266 |
| | Milk (\$1,000) | \$ 110,160 | \$ 99,960 | \$ 84,378 | \$ 128,553 | \$ 124,821 | \$ 88,208 | \$ 109,182 | \$ 134,550 | \$ 125,052 | \$ 135,138 | \$ 160,800 |
| | Other | \$ 21,612 | \$ 25,580 | \$ 29,548 | \$ 33,517 | \$ 37,485 | \$ 41,453 | \$ 45,421 | \$ 49,390 | \$ 53,358 | \$ 57,326 | \$ 61,294 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 21,612 | \$ 25,580 | \$ 29,548 | \$ 33,517 | \$ 37,485 | \$ 41,453 | \$ 45,421 | \$ 49,390 | \$ 53,358 | \$ 57,326 | \$ 61,294 |
| | Total (\$1,000) | \$ 298,628 | \$ 264,703 | \$ 251,465 | \$ 346,126 | \$ 369,589 | \$ 274,818 | \$ 304,491 | \$ 340,921 | \$ 383,830 | \$ 402,517 | \$ 474,646 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|---------------|---------|---------|---------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 699 | 573 | 765 | 950 | |
| | Cattle feedlots (112112) | 95 | 122 | 119 | 14 | |
| | Dairy cattle and milk production (11212) | 535 | 406 | 396 | 308 | |
| | Hog and pig farming (1122) | 71 | 62 | 97 | 160 | |
| | Poultry and egg production (1123) | 104 | 215 | 323 | 209 | |
| | Sheep and goat farming (1124) | 193 | 189 | 364 | 326 | |
| | Animal aquaculture and other animal production (1125,1129) | 468 | 1,316 | 1,147 | 1,291 | |
| Value of Sales (\$1,000) | Cattle and Calves | 10,651 | 15,994 | 15,660 | 31,076 | |
| | Hogs and Pigs | 1,492 | n/a | 813 | 1,726 | |
| | Poultry and Eggs | 73,637 | 78,848 | 75,831 | 38,938 | |
| | Milk and Other Dairy Products | 96,130 | 87,544 | 126,392 | 126,632 | |
| | Aquaculture | n/a | 31,944 | 26,300 | 75,107 | |
| | Other (calculated) | (181,910) | 26,917 | 45,621 | 8,572 | |
| | Total | - | 241,247 | 290,617 | 282,051 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 1,234 | 1,845 | 1,741 | 2,456 | |
| | | \$1,000 | 11,988 | 16,895 | 13,601 | 26,557 |
| | Breeding livestock purchased | (Farms) n/a | 1,007 | 721 | 946 | |
| | | \$1,000 | n/a | 5,319 | 4,596 | 3,163 |
| | Other livestock and poultry purchased | (Farms) n/a | 1,112 | 1,291 | 1,975 | |
| | | \$1,000 | n/a | 11,576 | 9,005 | 23,394 |
| | Feed purchased | (Farms) 2,201 | 3,567 | 3,640 | 4,659 | |
| | | \$1,000 | 79,605 | 73,459 | 103,475 | 104,563 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|-------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 46,758 | \$ 7,948 | 264 | \$ 2,248 |
| | Hogs, Pigs, and Other | \$ 104,875 | \$ 18,540 | 712 | \$ 5,243 |
| | Poultry and Eggs | \$ 426,512 | \$ 73,949 | 2,674 | \$ 20,913 |
| | Dairy | \$ 287,430 | \$ 52,871 | 2,286 | \$ 14,952 |
| | Total | \$ 865,575 | \$ 153,308 | 5,936 | \$ 43,355 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 10,238 | \$ 1,740 | 58 | \$ 492 |
| | Hogs, Pigs, and Other | \$ 56,587 | \$ 10,004 | 384 | \$ 2,829 |
| | Poultry and Eggs | \$ 72,071 | \$ 12,496 | 452 | \$ 3,534 |
| | Dairy | \$ 40,654 | \$ 7,478 | 323 | \$ 2,115 |
| | Total | \$ 179,551 | \$ 31,718 | 1,217 | \$ 8,970 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.7291 | \$ 0.2939 | 9.8 | |
| | Hogs, Pigs, and Other | \$ 1.6704 | \$ 0.2953 | 11.3 | |
| | Poultry and Eggs | \$ 1.9039 | \$ 0.3301 | 11.9 | |
| | Dairy | \$ 1.7875 | \$ 0.3288 | 14.2 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 8.0% | |
| | Total | | | 28.3% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: MARYLAND

Maryland Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Maryland's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Maryland. The success of Maryland animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Maryland during 2014 animal agriculture contributed:

- \$2.6 billion in economic output
- 15,608 jobs
- \$427.4 million in earnings
- \$107.2 million in income taxes paid at local, state, and federal levels
- \$48.4 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Maryland increased economic output by over \$426.6 million, boosted household earnings by \$69.7 million, contributed 2,404 additional jobs and paid \$17.5 million in additional tax revenues.

Maryland's animal agriculture consumed about 390.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (344.8 thousand tons)
- Egg-Laying Hens (20.5 thousand tons)
- Dairy Cows (8.5 thousand tons)

This report examines animal agriculture in Maryland over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Maryland, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a contributor to the economic well-being of the people of Maryland and beyond.

Maryland Economic Impact of Animal Agriculture

Animal agriculture is an important part of Maryland's economy. In 2014, Maryland's animal agriculture contributed the following to the economy:

- About \$2.6 billion in economic output
- \$427.4 million in household earnings
- 15,608 jobs
- \$107.2 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade Maryland's animal agriculture has:

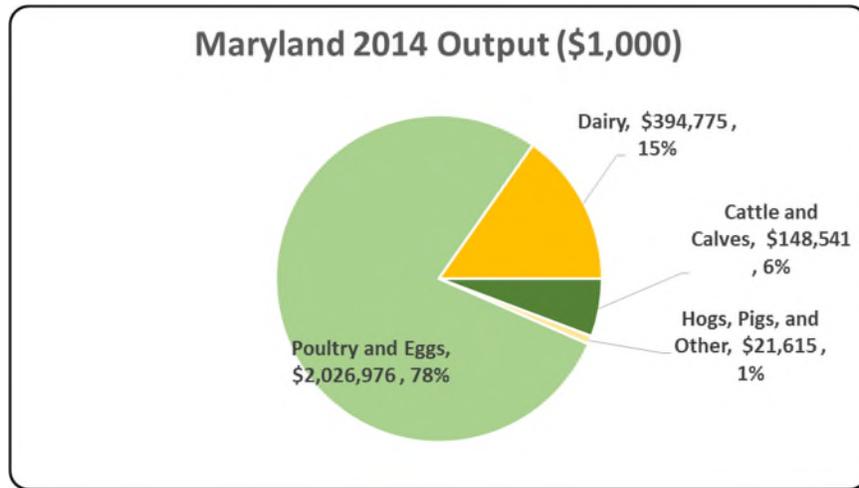
- Increased economic output by \$426.6 million
- Boosted household earnings by \$69.7 million
- Added 2,404 jobs
- Paid an additional \$17.5 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 2,591,906 | \$ 426,650 | 19.70% |
| Earnings (\$1,000) | \$ 427,392 | \$ 69,672 | 19.48% |
| Employment (Jobs) | 15,608 | 2,404 | 18.21% |
| Income Taxes Paid (\$1,000) | \$ 107,190 | \$ 17,474 | 19.48% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 48,380 | | |

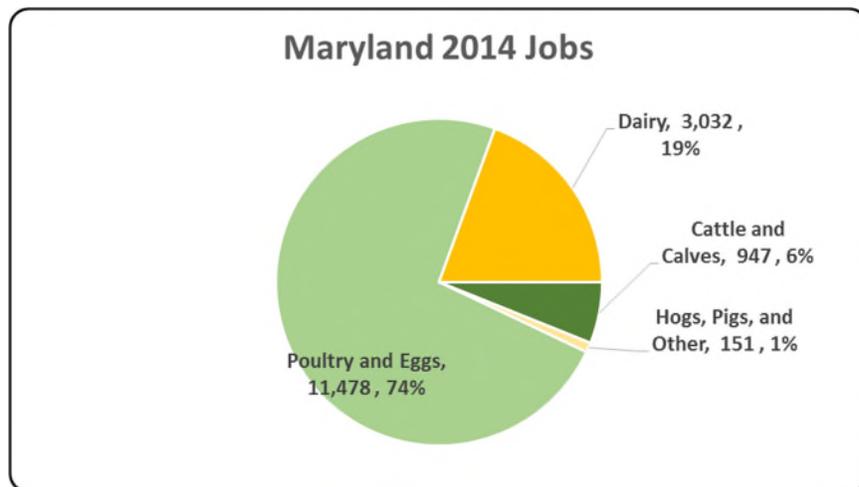
Maryland Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Maryland economy. Animal agriculture’s impact on Maryland total economic output is about \$2.6 billion.



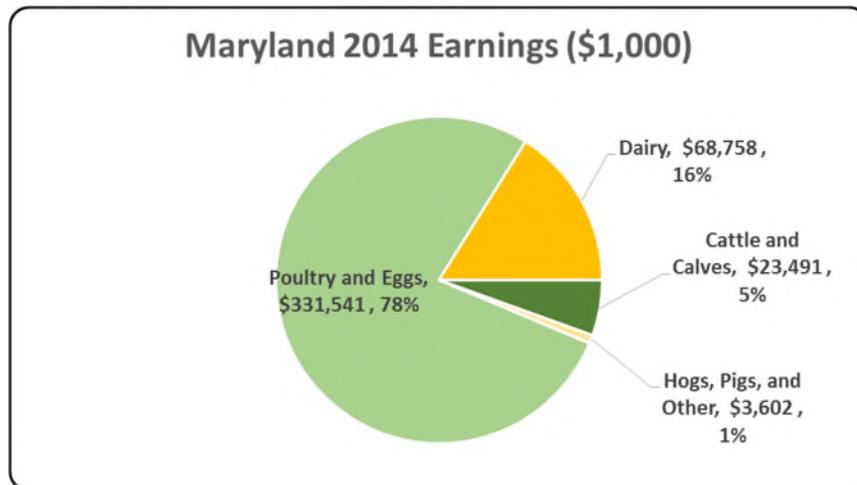
Maryland Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Maryland in terms of animal agriculture jobs. As shown, animal agriculture contributes about 15,608 jobs within and outside of animal agriculture.



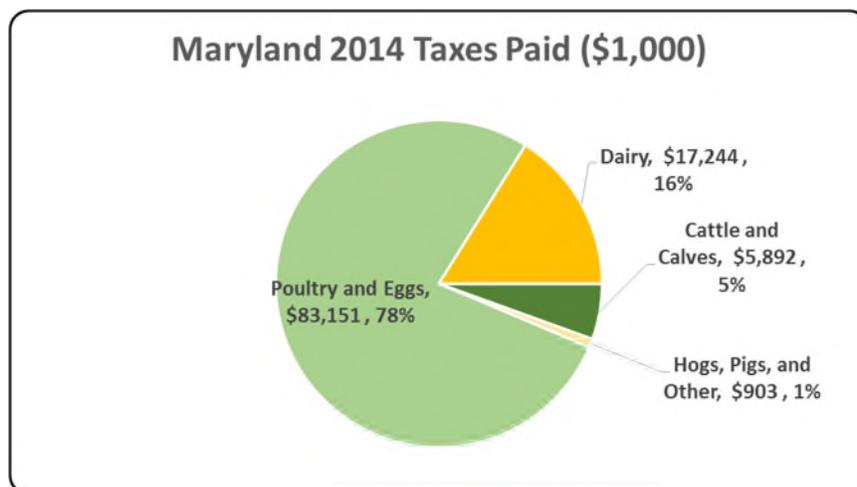
Maryland Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Maryland economy in terms of earnings. Maryland’s animal agriculture contributed about \$427.4 million to household earnings in 2014.



Maryland Taxes Paid by Animal Agriculture

Maryland’s animal agriculture is also a source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$107.2 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$48.4 million in property taxes paid by all of Maryland agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



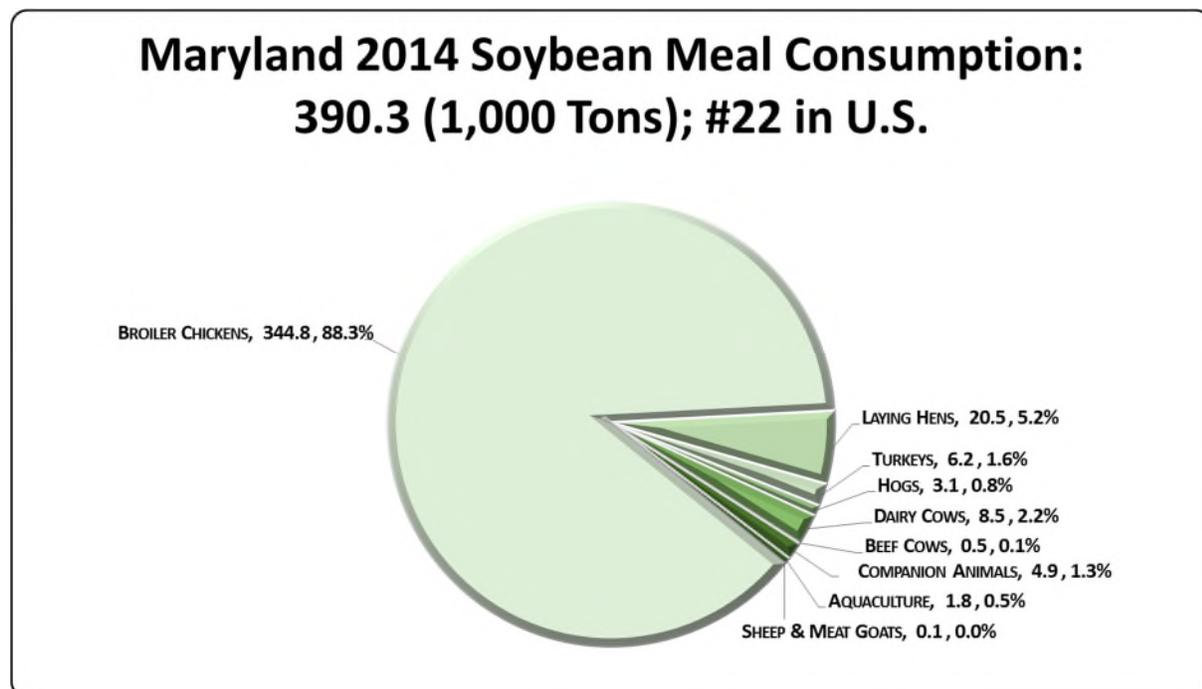
Maryland Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Maryland's animal agriculture consumed almost 390.3 thousand tons of soybean meal in 2014, placing the state as #22 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (344.8 thousand tons)
- Egg-Laying Hens (20.5 thousand tons)
- Dairy Cows (8.5 thousand tons)



Maryland Animal Unit (AU) Trends

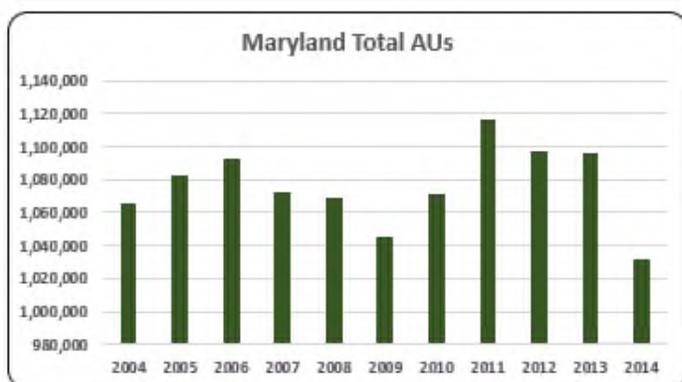
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Maryland. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Maryland and to give perspective on Maryland's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

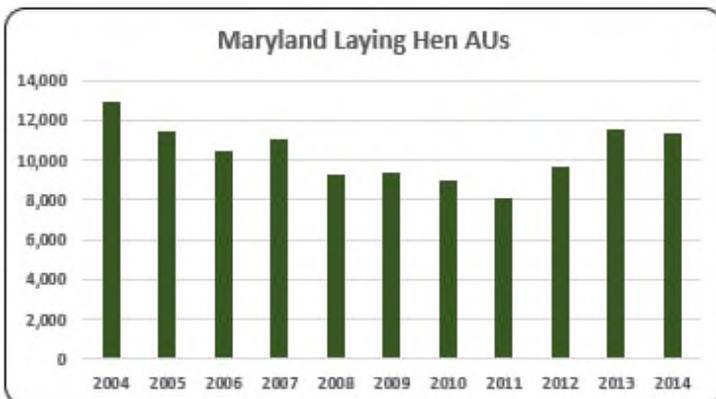
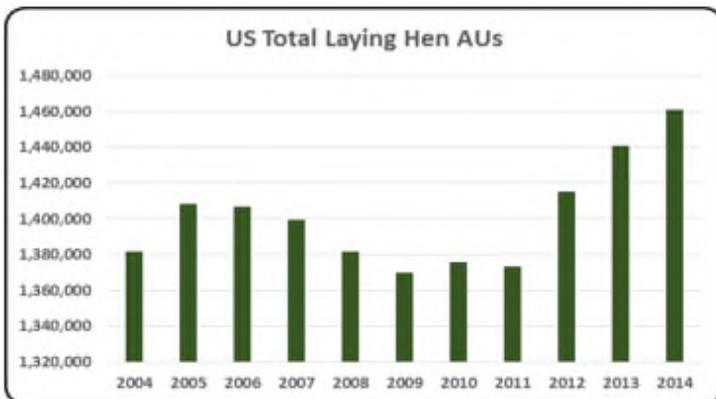
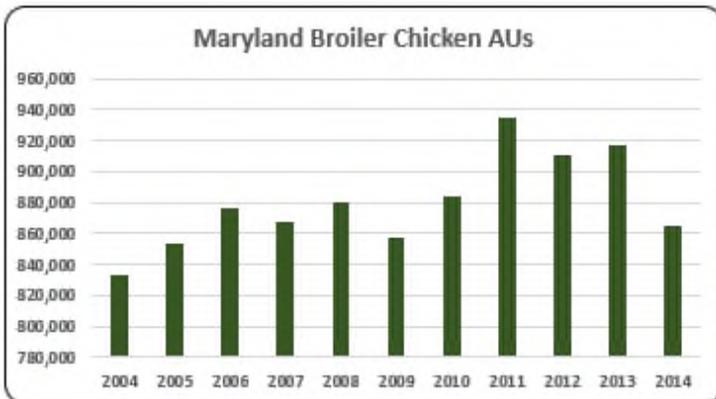
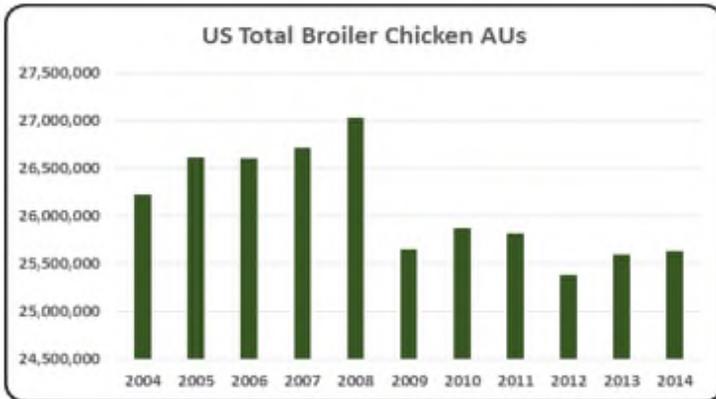
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Maryland, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (865.0 thousand AUs), Dairy Cows (70.0 thousand AUs), and Beef Cows (65.3 thousand AUs). Total animal units in Maryland during 2014 were 1,031.7 thousand AUs.



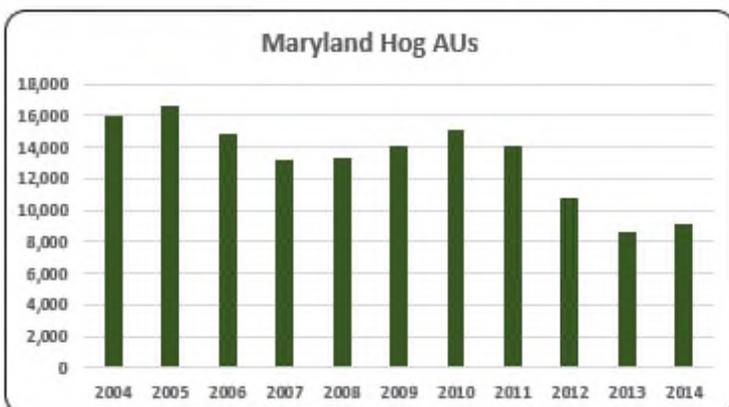
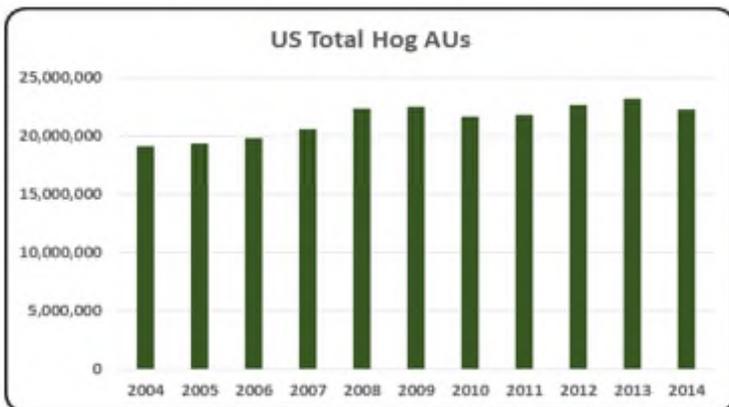
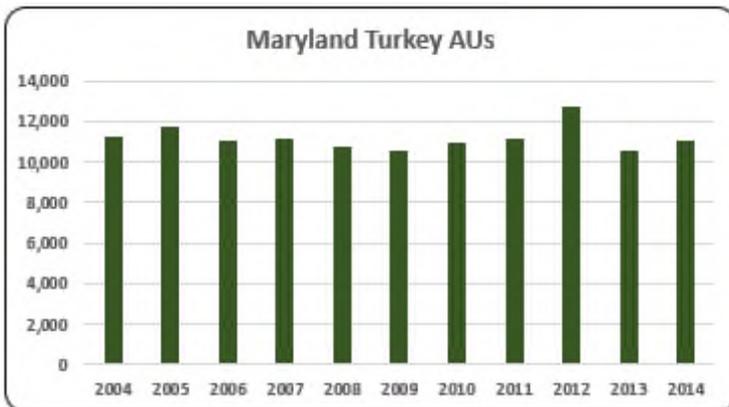
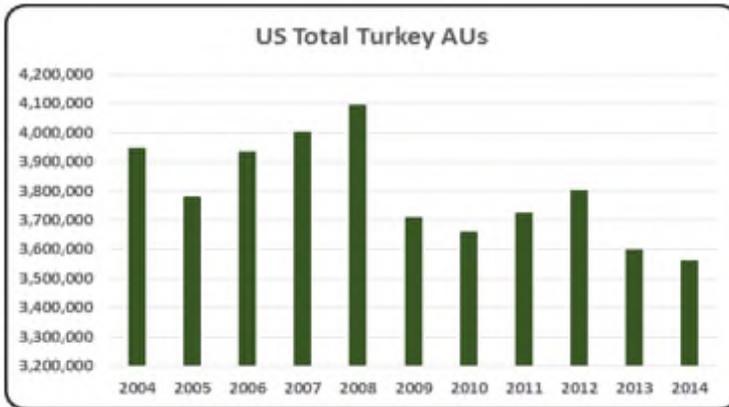
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



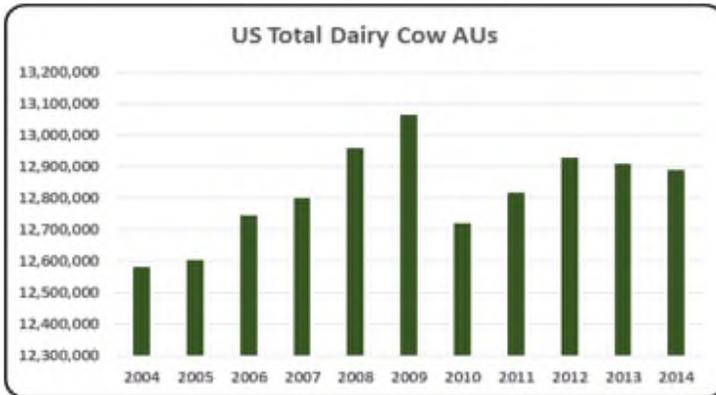
- There were 1,031.7 thousand AUs in Maryland in 2014. In 2014, AUs declined about 6% year-over-year and there were 34,421 fewer AUs since 2004.



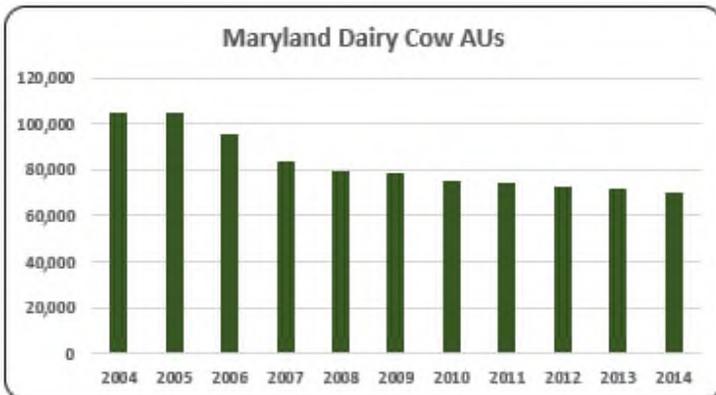
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- The average number of broiler AUs in Maryland during 2004-2014 was 879,906, representing about 83.8% of all AUs in the state, making broiler production the most important animal production in the state. Broiler production increased 3.8% during the decade.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Only 1.10% of the animal production in Maryland comes from layer production. There were 11,301 layers AUs in 2014.



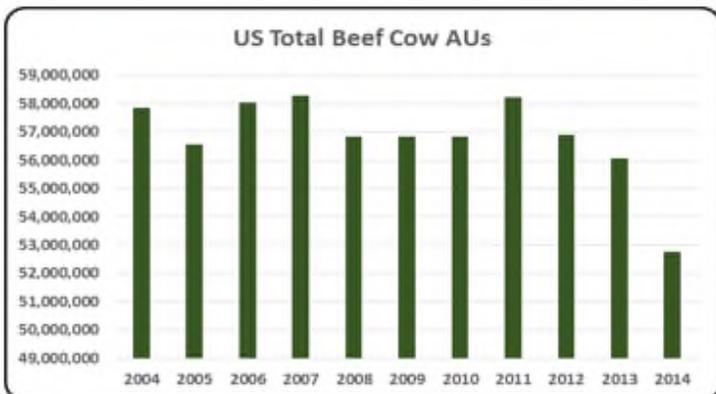
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production in Maryland is very small with only 1.07% in 2014. Turkey numbers have been relatively steady during the decade averaging about 11,182 turkey AUs.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production is the smallest animal production in the state Maryland representing less than 1% (9,060) of all AUs in the state in 2014



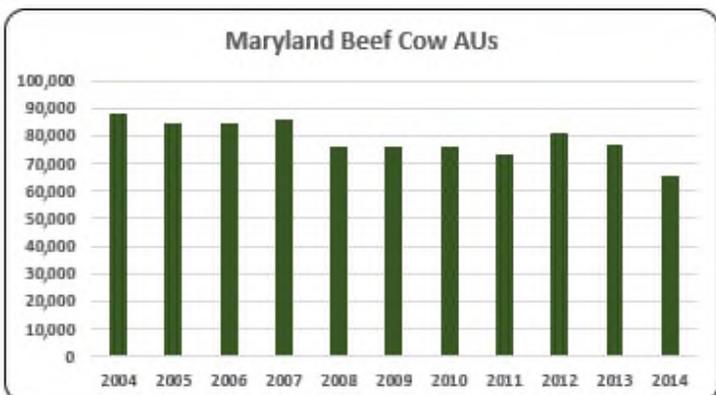
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Maryland had 70,000 dairy cow AUs in 2014, 2% below the previous year. Dairy cow production has consistently declined throughout the decade from 105,000 AUs in 2004 to 70,000 in 2014, representing a 33% reduction.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- There were 65,265 beef cow AUs in Maryland in 2014 declining 15.2% year-over-year. Beef cow AUs have fallen by 22,485 AUs since 2004.

Maryland Additional Information and Methodology

Animal agriculture is an important part of Maryland's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Maryland, of interest is the degree to which the industry impacts the Maryland economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Maryland animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Maryland's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Maryland which have occurred. As shown in this state report, Maryland has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Maryland. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Maryland Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Maryland's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Maryland, \$1.474 to \$1.875 million in total economic activity, \$0.243 to \$0.307 in household wages and 10 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.5372 | \$ 0.2431 | 9.8 |
| | Hogs, Pigs, and Other | \$ 1.4744 | \$ 0.2457 | 10.3 |
| | Poultry and Eggs | \$ 1.8751 | \$ 0.3067 | 10.6 |
| | Dairy | \$ 1.6128 | \$ 0.2809 | 12.4 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|-------------------|-------------------|-------------------|---------------------|---------------------|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 87,750 | 84,525 | 84,450 | 85,650 | 75,750 | 75,750 | 75,750 | 73,590 | 81,345 | 76,995 | 65,265 |
| | Hog and Pig AUs | 15,975 | 16,575 | 14,850 | 13,140 | 13,290 | 14,040 | 15,090 | 14,040 | 10,785 | 8,670 | 9,060 |
| | Broiler AUs | 833,210 | 853,012 | 876,356 | 867,025 | 880,449 | 857,418 | 884,314 | 934,708 | 910,152 | 917,324 | 864,993 |
| | Turkey AUs | 11,250 | 11,762 | 11,010 | 11,173 | 10,769 | 10,549 | 10,988 | 11,184 | 12,683 | 10,580 | 11,049 |
| | Egg Layer AUs | 12,904 | 11,480 | 10,408 | 11,024 | 9,312 | 9,368 | 9,016 | 8,120 | 9,671 | 11,546 | 11,301 |
| | Dairy AUs | 105,000 | 105,000 | 95,200 | 84,000 | 79,800 | 78,400 | 75,600 | 74,200 | 72,800 | 71,400 | 70,000 |
| | Total Animal Units | 1,066,089 | 1,082,354 | 1,092,275 | 1,072,013 | 1,069,371 | 1,045,525 | 1,070,758 | 1,115,842 | 1,097,436 | 1,096,514 | 1,031,668 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 72,814 | \$ 72,473 | \$ 71,081 | \$ 69,617 | \$ 63,869 | \$ 54,222 | \$ 63,252 | \$ 78,061 | \$ 89,314 | \$ 79,343 | \$ 96,631 |
| | Hogs and Pigs (\$1,000) | \$ 6,571 | \$ 8,547 | \$ 5,930 | \$ 5,490 | \$ 6,503 | \$ 6,079 | \$ 6,481 | \$ 6,626 | \$ 6,099 | \$ 6,629 | \$ 8,644 |
| | Broilers (\$1,000) | \$ 628,406 | \$ 639,216 | \$ 610,470 | \$ 732,274 | \$ 741,704 | \$ 639,206 | \$ 690,899 | \$ 756,799 | \$ 802,400 | \$ 981,883 | \$ 989,962 |
| | Turkeys (\$1,000) | \$ 5,708 | \$ 7,039 | \$ 12,520 | \$ 7,003 | \$ 14,546 | \$ 9,755 | \$ 13,069 | \$ 14,658 | \$ 18,394 | \$ 12,113 | \$ 20,281 |
| | Eggs (\$1,000) | \$ 45,737 | \$ 31,069 | \$ 29,907 | \$ 49,170 | \$ 62,682 | \$ 33,150 | \$ 35,837 | \$ 38,008 | \$ 46,750 | \$ 52,925 | \$ 70,753 |
| | Milk (\$1,000) | \$ 197,540 | \$ 183,870 | \$ 152,628 | \$ 210,200 | \$ 195,510 | \$ 145,580 | \$ 184,184 | \$ 206,610 | \$ 188,947 | \$ 203,148 | \$ 244,776 |
| | Other | \$ 8,638 | \$ 8,123 | \$ 7,758 | \$ 8,007 | \$ 7,817 | \$ 6,725 | \$ 6,583 | \$ 6,442 | \$ 6,300 | \$ 6,158 | \$ 6,016 |
| | Sheep and Lambs (\$1,000) | \$ 1,204 | \$ 831 | \$ 608 | \$ 998 | \$ 950 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 7,434 | \$ 7,292 | \$ 7,150 | \$ 7,009 | \$ 6,867 | \$ 6,725 | \$ 6,583 | \$ 6,442 | \$ 6,300 | \$ 6,158 | \$ 6,016 |
| | Total (\$1,000) | \$ 965,414 | \$ 950,337 | \$ 890,294 | \$ 1,081,761 | \$ 1,092,631 | \$ 894,717 | \$ 1,000,305 | \$ 1,107,203 | \$ 1,158,204 | \$ 1,342,199 | \$ 1,437,063 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|---------|---------|----------|-----------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 1,867 | 1,655 | 1,582 | 1,649 | |
| | Cattle feedlots (112112) | 356 | 420 | 189 | 45 | |
| | Dairy cattle and milk production (11212) | 889 | 698 | 565 | 417 | |
| | Hog and pig farming (1122) | 173 | 94 | 109 | 76 | |
| | Poultry and egg production (1123) | 1,091 | 964 | 1,001 | 922 | |
| | Sheep and goat farming (1124) | 289 | 370 | 594 | 482 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,280 | 1,757 | 2,070 | 1,995 | |
| Value of Sales (\$1,000) | Cattle and Calves | 56,287 | 50,570 | 58,293 | 69,917 | |
| | Hogs and Pigs | 14,292 | 8,268 | withheld | withheld | |
| | Poultry and Eggs | 632,887 | 583,343 | 903,531 | 922,999 | |
| | Milk and Other Dairy Products | 172,218 | 169,458 | 192,426 | 187,497 | |
| | Aquaculture | 14,822 | 1,459 | 4,023 | 9,011 | |
| | Other (calculated) | n/a | 5,065 | 47,514 | withheld | |
| | Total | | 890,506 | 818,163 | 1,205,787 | 1,189,424 |
| Input Purchases | Livestock and poultry purchased | (Farms) | 3,714 | 3,300 | 3,087 | 3,184 |
| | | \$1,000 | 129,432 | 96,056 | 171,246 | 161,816 |
| | Breeding livestock purchased | (Farms) | n/a | 1,208 | 1,216 | 1,293 |
| | | \$1,000 | n/a | 7,486 | 10,151 | 13,058 |
| | Other livestock and poultry purchased | (Farms) | n/a | 2,376 | 2,236 | 2,296 |
| | | \$1,000 | n/a | 88,569 | 161,095 | 148,758 |
| Feed purchased | (Farms) | 6,112 | 6,740 | 6,474 | 7,133 | |
| | \$1,000 | 435,279 | 318,290 | 456,411 | 629,143 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 148,541 | \$ 23,491 | 947 | \$ 5,892 |
| | Hogs, Pigs, and Other | \$ 21,615 | \$ 3,602 | 151 | \$ 903 |
| | Poultry and Eggs | \$ 2,026,976 | \$ 331,541 | 11,478 | \$ 83,151 |
| | Dairy | \$ 394,775 | \$ 68,758 | 3,032 | \$ 17,244 |
| | Total | \$ 2,591,906 | \$ 427,392 | 15,608 | \$ 107,190 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 8,267 | \$ 1,307 | 53 | \$ 328 |
| | Hogs, Pigs, and Other | \$ (6,487) | \$ (1,081) | (45) | \$ (271) |
| | Poultry and Eggs | \$ 429,366 | \$ 70,229 | 2,431 | \$ 17,613 |
| | Dairy | \$ (4,496) | \$ (783) | (35) | \$ (196) |
| | Total | \$ 426,650 | \$ 69,672 | 2,404 | \$ 17,474 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.5372 | \$ 0.2431 | 9.8 | |
| | Hogs, Pigs, and Other | \$ 1.4744 | \$ 0.2457 | 10.3 | |
| | Poultry and Eggs | \$ 1.8751 | \$ 0.3067 | 10.6 | |
| | Dairy | \$ 1.6128 | \$ 0.2809 | 12.4 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 4.8% |
| | Total | | | | 25.1% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: MASSACHUSETTS

Massachusetts Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Massachusetts's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Massachusetts. The success of Massachusetts animal agriculture in turn has a small impact on the rest of the state and regional economies. For example, in the state of Massachusetts during 2014 animal agriculture contributed:

- \$225.4 million in economic output
- 1,504 jobs
- \$38.5 million in earnings
- \$9.9 million in income taxes paid at local, state, and federal levels
- \$38.0 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Massachusetts increased economic output by over \$27.8 million, boosted household earnings by \$4.6 million, contributed 159 additional jobs and paid \$1.2 million in additional tax revenues.

Massachusetts's animal agriculture consumed about 19,100 tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Turkeys (7,700 tons)
- Companion Animals (4,700 tons)
- Egg-Laying Hens (3,100 tons)

This report examines animal agriculture in Massachusetts over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Massachusetts, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of Massachusetts.

Massachusetts Economic Impact of Animal Agriculture

Animal agriculture is a small part of Massachusetts's economy. In 2014, Massachusetts's animal agriculture contributed the following to the economy:

- About \$225.4 million in economic output
- \$38.5 million in household earnings
- 1,504 jobs
- \$9.9 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade Massachusetts's animal agriculture has:

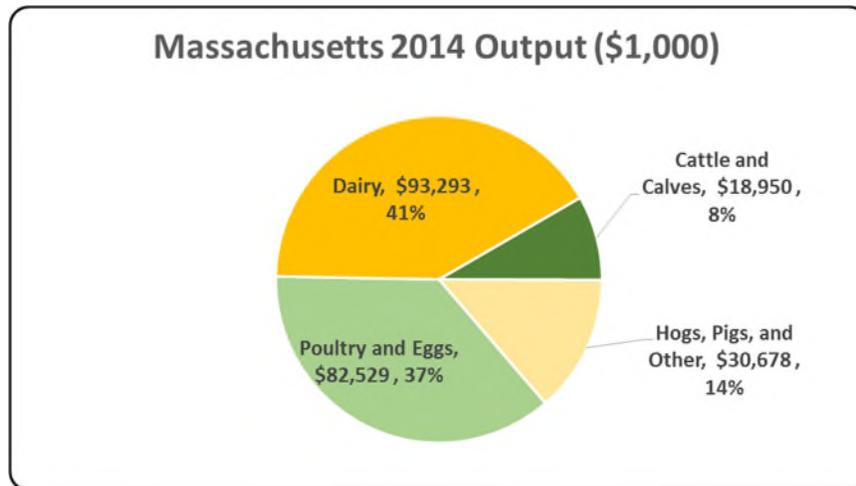
- Increased economic output by \$27.8 million
- Boosted household earnings by \$4.6 million
- Added 159 jobs
- Paid an additional \$1.2 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|------------|------------------|--------------------|
| Output (\$1,000) | \$ 225,449 | \$ 27,752 | 14.04% |
| Earnings (\$1,000) | \$ 38,540 | \$ 4,556 | 13.41% |
| Employment (Jobs) | 1,504 | 159 | 11.84% |
| Income Taxes Paid (\$1,000) | \$ 9,859 | \$ 1,165 | 13.41% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 37,954 | | |

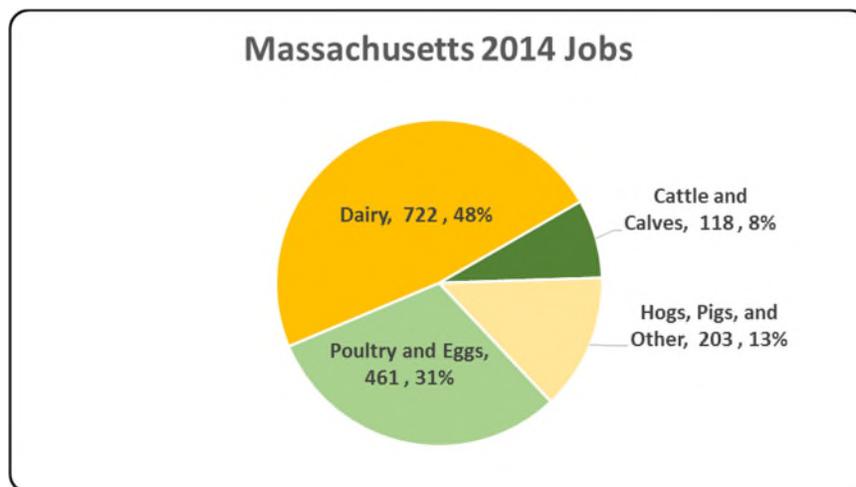
Massachusetts Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Massachusetts economy. Animal agriculture’s impact on Massachusetts total economic output is about \$225.4 million.



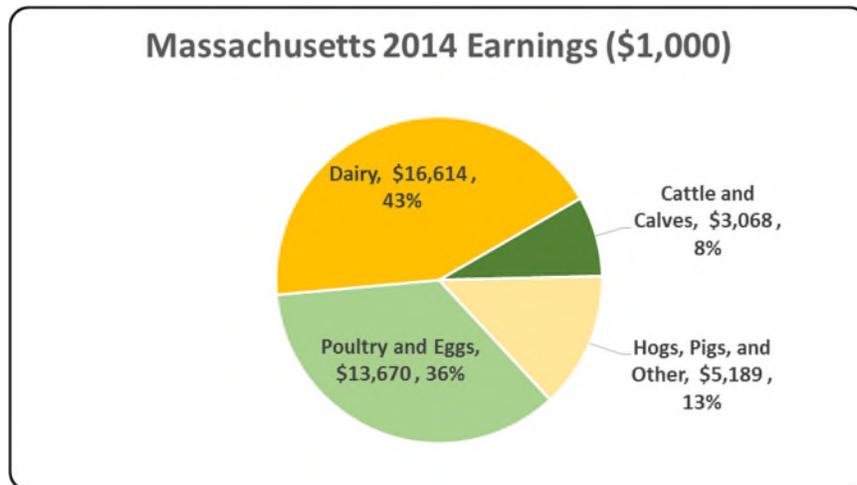
Massachusetts Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Massachusetts in terms of animal agriculture jobs. As shown, animal agriculture contributes about 1,504 jobs within and outside of animal agriculture.



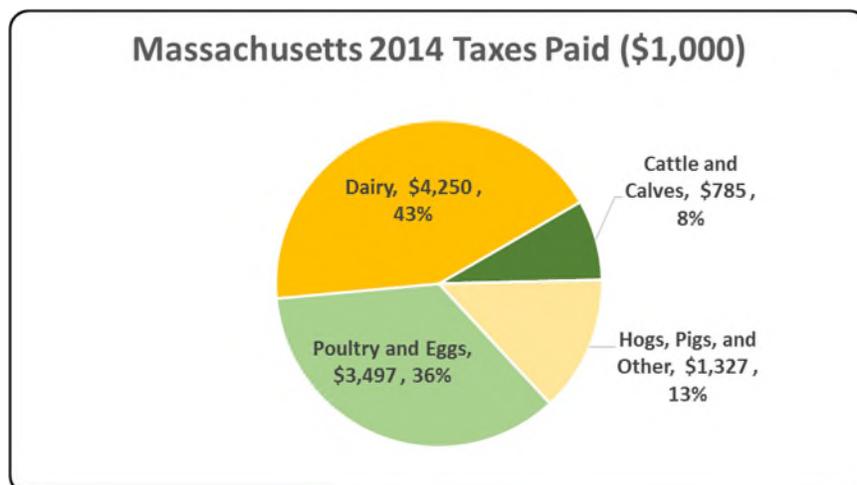
Massachusetts Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Massachusetts economy in terms of earnings. Massachusetts’s animal agriculture contributed about \$38.5 million to household earnings in 2014.



Massachusetts Taxes Paid by Animal Agriculture

Massachusetts’s animal agriculture is also a small source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$9.9 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$38.0 million in property taxes paid by all of Massachusetts agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



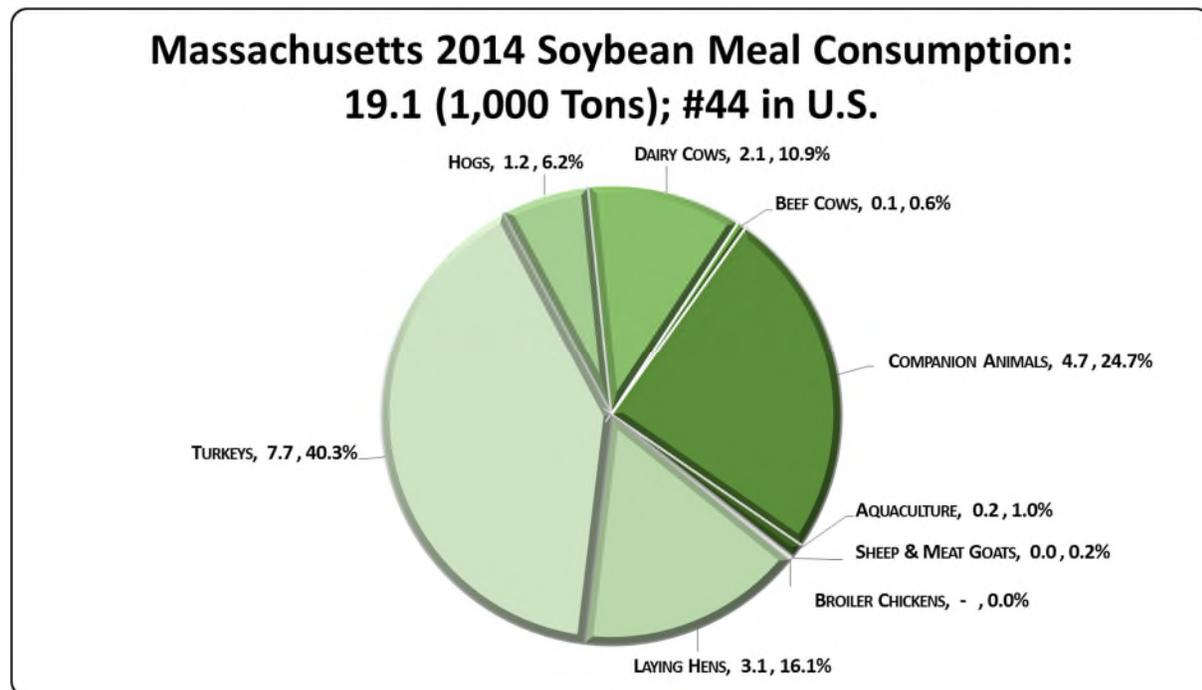
Massachusetts Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Massachusetts’s animal agriculture consumed almost 19,100 tons of soybean meal in 2014, placing the state as #44 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Turkeys (7,700 tons)
- Companion Animals (4,700 tons)
- Egg-Laying Hens (3,100 tons)

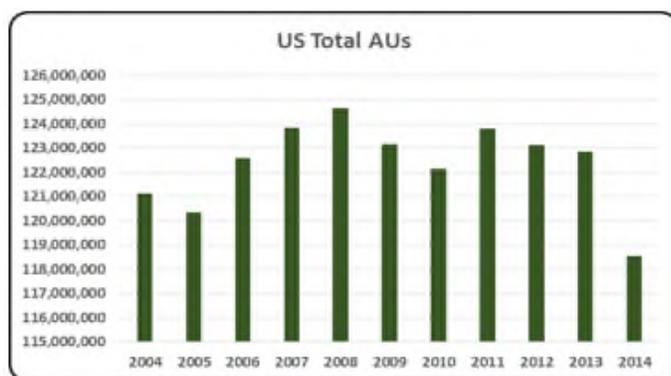


Massachusetts Animal Unit (AU) Trends

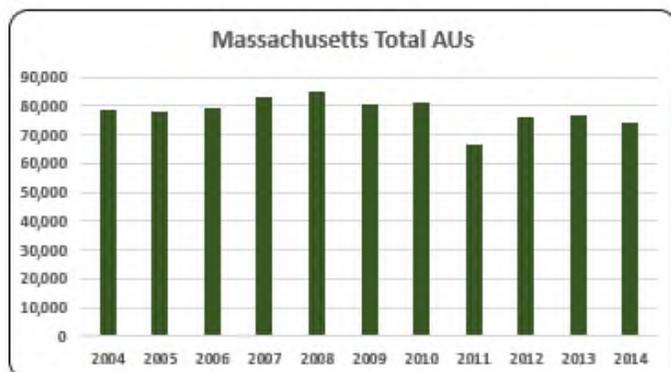
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Massachusetts. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Massachusetts and to give perspective on Massachusetts's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

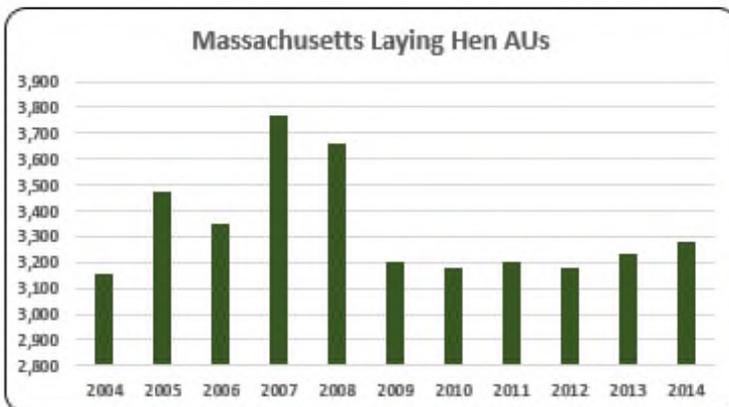
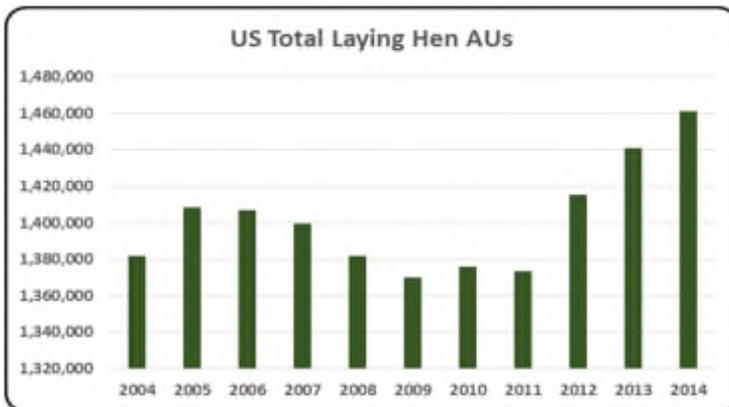
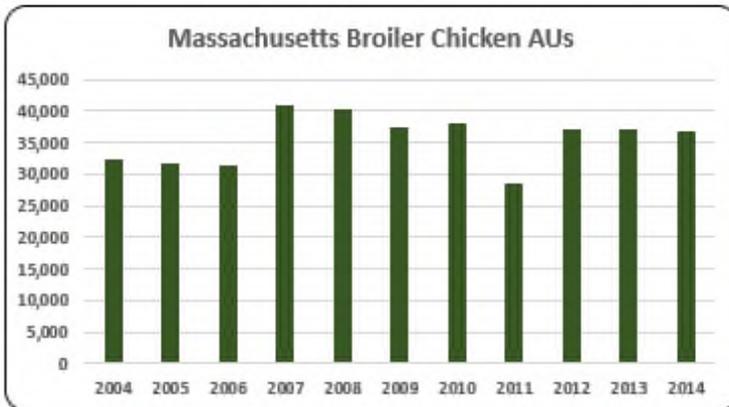
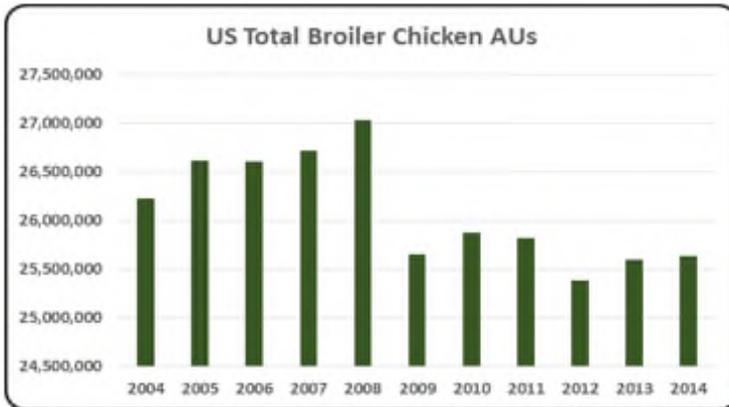
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Massachusetts, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (36.9 thousand AUs), Dairy Cows (16.8 thousand AUs), and Beef Cows (14.4 thousand AUs). Total animal units in Massachusetts during 2014 were 74.0 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- Overall animal production in Massachusetts is very small representing only 0.06% (73,977) of all AUs in the country in 2014.

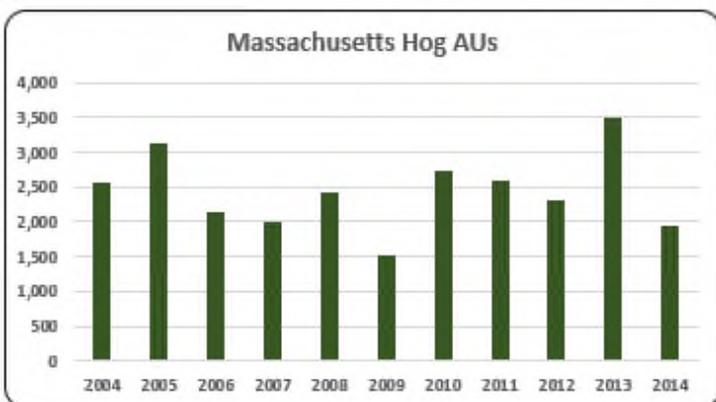
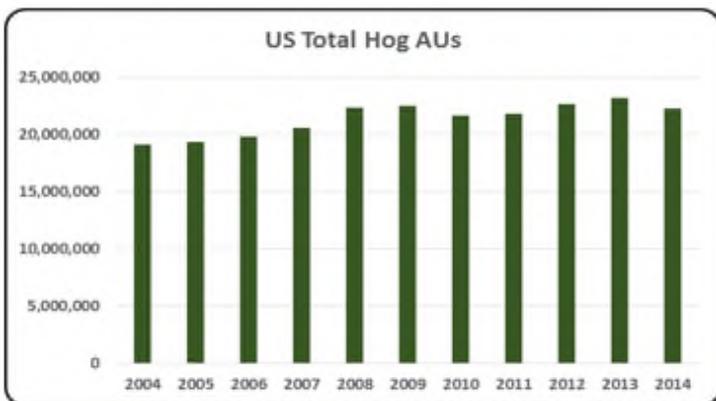
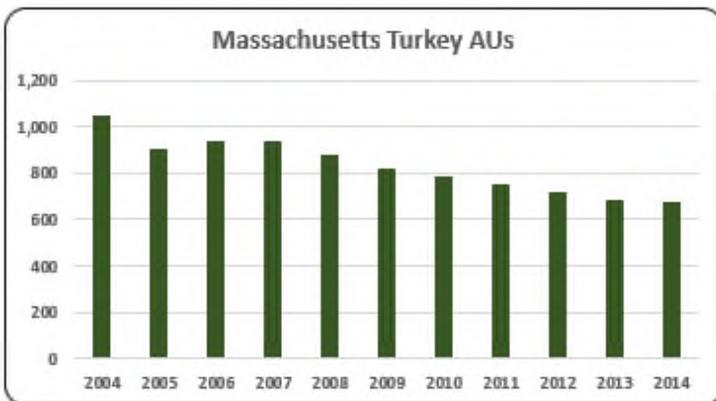
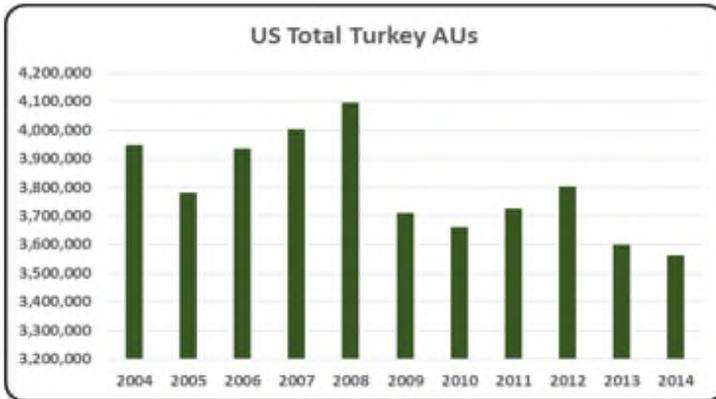


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

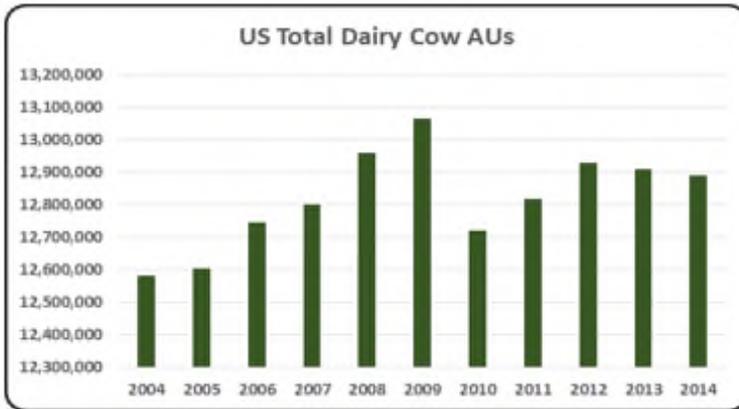
- About half (36,874) of all AUs in Massachusetts in 2014 were broiler AUs. Broiler production has fluctuated throughout the decade but in 2014 broiler production remained below record the record levels of 2007-2008 which averaged 40,623 broiler AUs.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

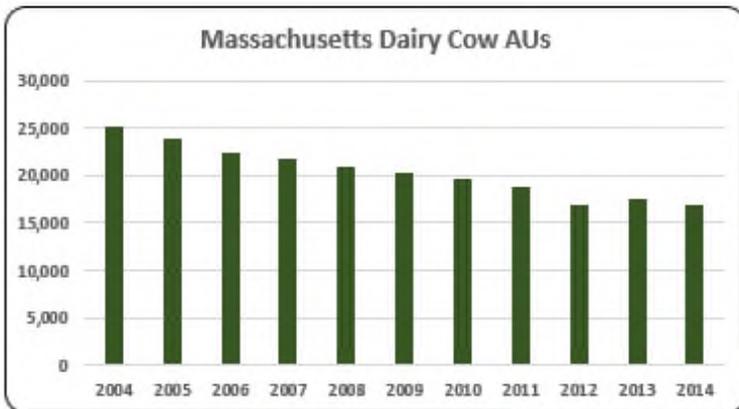
- Layer AUs dropped in 2009 to 3,282 and averaged 3,335 over the ten year period.



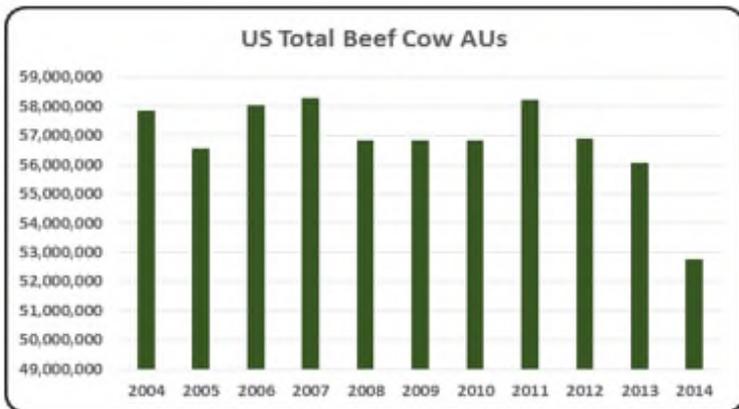
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production represents less than 1% of the animal production in the state. Turkey production has been declining since the beginning of the decade from 1,050 turkey AUs in 2004 to 672 turkey AUs in 2014.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog AUs declined 44.6% to 1,935 from a year earlier. Hog production has fallen 24% since 2004.



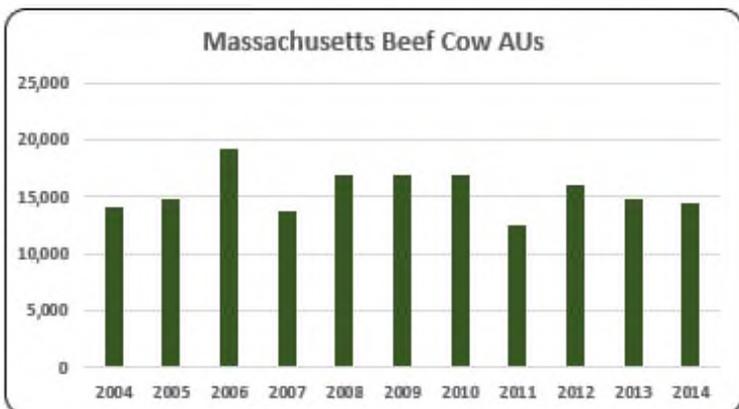
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Almost 23% (16,800) of all AUs in Massachusetts in 2014 were contributed by dairy cow production. Production has declined 33.0% during 2004-2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- About 19.5% (14,415) of total AUs in Massachusetts were from beef cow production. The average number of beef cow AUs was 15,502 during the decade.

Massachusetts Additional Information and Methodology

Animal agriculture is a small part of Massachusetts's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Massachusetts, of interest is the degree to which the industry impacts the Massachusetts economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Massachusetts animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Massachusetts's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Massachusetts which have occurred. As shown in this state report, Massachusetts has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Massachusetts. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Massachusetts Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Massachusetts's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Massachusetts, \$1.437 to \$1.534 million in total economic activity, \$0.243 to \$0.273 in household wages and 8 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.5067 | \$ 0.2439 | 9.4 |
| | Hogs, Pigs, and Other | \$ 1.4366 | \$ 0.2430 | 9.5 |
| | Poultry and Eggs | \$ 1.5202 | \$ 0.2518 | 8.5 |
| | Dairy | \$ 1.5341 | \$ 0.2732 | 11.9 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|-------------------|------------------|------------------|-------------------|-------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| Animal Units (AUs) | Beef Cattle AUs | 14,100 | 14,850 | 19,200 | 13,800 | 16,950 | 16,950 | 16,950 | 12,450 | 16,065 | 14,790 | 14,415 |
| | Hog and Pig AUs | 2,550 | 3,135 | 2,130 | 1,995 | 2,415 | 1,530 | 2,730 | 2,580 | 2,295 | 3,495 | 1,935 |
| | Broiler AUs | 32,370 | 31,689 | 31,475 | 40,943 | 40,304 | 37,473 | 37,977 | 28,616 | 37,215 | 37,085 | 36,874 |
| | Turkey AUs | 1,050 | 905 | 935 | 936 | 876 | 818 | 784 | 751 | 719 | 681 | 672 |
| | Egg Layer AUs | 3,154 | 3,474 | 3,352 | 3,770 | 3,662 | 3,203 | 3,182 | 3,201 | 3,181 | 3,230 | 3,282 |
| | Dairy AUs | 25,200 | 23,800 | 22,400 | 21,700 | 21,000 | 20,300 | 19,600 | 18,900 | 16,800 | 17,500 | 16,800 |
| | Total Animal Units | 78,424 | 77,852 | 79,492 | 83,144 | 85,207 | 80,274 | 81,224 | 66,498 | 76,274 | 76,781 | 73,977 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 7,709 | \$ 8,053 | \$ 7,811 | \$ 7,677 | \$ 6,816 | \$ 5,118 | \$ 5,197 | \$ 7,792 | \$ 10,692 | \$ 11,174 | \$ 12,577 |
| | Hogs and Pigs (\$1,000) | \$ 1,367 | \$ 1,887 | \$ 974 | \$ 984 | \$ 1,296 | \$ 656 | \$ 1,652 | \$ 1,911 | \$ 1,526 | \$ 2,816 | \$ 2,199 |
| | Broilers (\$1,000) | \$ 27,226 | \$ 25,790 | \$ 19,930 | \$ 30,801 | \$ 31,699 | \$ 27,458 | \$ 28,900 | \$ 25,463 | \$ 37,072 | \$ 45,163 | \$ 47,378 |
| | Turkeys (\$1,000) | \$ 2,760 | \$ 2,356 | \$ 2,416 | \$ 2,918 | \$ 2,746 | \$ 2,799 | \$ 2,853 | \$ 2,906 | \$ 2,960 | \$ 3,013 | \$ 3,066 |
| | Eggs (\$1,000) | \$ 5,078 | \$ 3,591 | \$ 3,875 | \$ 4,288 | \$ 3,718 | \$ 2,603 | \$ 2,010 | \$ 2,321 | \$ 2,583 | \$ 3,496 | \$ 3,844 |
| | Milk (\$1,000) | \$ 51,504 | \$ 47,850 | \$ 40,032 | \$ 53,550 | \$ 51,308 | \$ 35,178 | \$ 43,560 | \$ 48,400 | \$ 43,800 | \$ 50,140 | \$ 60,813 |
| | Other | \$ 8,252 | \$ 9,342 | \$ 10,432 | \$ 11,523 | \$ 12,613 | \$ 13,704 | \$ 14,794 | \$ 15,884 | \$ 16,975 | \$ 18,065 | \$ 19,155 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 8,252 | \$ 9,342 | \$ 10,432 | \$ 11,523 | \$ 12,613 | \$ 13,704 | \$ 14,794 | \$ 15,884 | \$ 16,975 | \$ 18,065 | \$ 19,155 |
| | Total (\$1,000) | \$ 103,896 | \$ 98,869 | \$ 85,470 | \$ 111,740 | \$ 110,196 | \$ 87,516 | \$ 98,966 | \$ 104,677 | \$ 115,607 | \$ 133,867 | \$ 149,032 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|---------------|----------------|----------------|---------------|--------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 472 | 337 | 751 | 620 | |
| | Cattle feedlots (112112) | 49 | 87 | 53 | 8 | |
| | Dairy cattle and milk production (11212) | 338 | 279 | 258 | 147 | |
| | Hog and pig farming (1122) | 118 | 72 | 82 | 135 | |
| | Poultry and egg production (1123) | 115 | 163 | 480 | 380 | |
| | Sheep and goat farming (1124) | 163 | 211 | 279 | 365 | |
| | Animal aquaculture and other animal production (1125,1129) | 627 | 1,312 | 1,776 | 1,887 | |
| Value of Sales (\$1,000) | Cattle and Calves | 6,844 | 9,612 | 12,444 | 9,503 | |
| | Hogs and Pigs | 2,638 | withheld | 2,108 | 2,898 | |
| | Poultry and Eggs | 16,054 | 12,107 | 13,207 | 11,748 | |
| | Milk and Other Dairy Products | 59,497 | withheld | 50,485 | 44,250 | |
| | Aquaculture | n/a | 9,481 | 18,548 | 23,251 | |
| | Other (calculated) | 13,563 | 76,044 | 28,546 | 6,046 | |
| | Total | 98,596 | 107,244 | 125,338 | 97,696 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 1,075 | 1,101 | 1,450 | 1,961 | |
| | | \$1,000 | 7,408 | 6,482 | 5,819 | 7,275 |
| | Breeding livestock purchased | (Farms) n/a | 373 | 556 | 637 | |
| | | \$1,000 | n/a | 2,703 | 1,776 | 2,006 |
| | Other livestock and poultry purchased | (Farms) n/a | 816 | 1,064 | 1,612 | |
| | | \$1,000 | n/a | 3,779 | 4,043 | 5,268 |
| | Feed purchased | (Farms) 2,161 | 2,698 | 3,821 | 4,276 | |
| | | \$1,000 | 31,880 | 26,253 | 45,134 | 50,732 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 18,950 | \$ 3,068 | 118 | \$ 785 |
| | Hogs, Pigs, and Other | \$ 30,678 | \$ 5,189 | 203 | \$ 1,327 |
| | Poultry and Eggs | \$ 82,529 | \$ 13,670 | 461 | \$ 3,497 |
| | Dairy | \$ 93,293 | \$ 16,614 | 722 | \$ 4,250 |
| | Total | \$ 225,449 | \$ 38,540 | 1,504 | \$ 9,859 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 4,393 | \$ 711 | 27 | \$ 182 |
| | Hogs, Pigs, and Other | \$ 13,360 | \$ 2,260 | 88 | \$ 578 |
| | Poultry and Eggs | \$ 15,726 | \$ 2,605 | 88 | \$ 666 |
| | Dairy | \$ (5,728) | \$ (1,020) | (44) | \$ (261) |
| | Total | \$ 27,752 | \$ 4,556 | 159 | \$ 1,165 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 1.5067 | \$ 0.2439 | 9.4 | |
| | Hogs, Pigs, and Other | \$ 1.4366 | \$ 0.2430 | 9.5 | |
| | Poultry and Eggs | \$ 1.5202 | \$ 0.2518 | 8.5 | |
| | Dairy | \$ 1.5341 | \$ 0.2732 | 11.9 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 5.3% | |
| | Total | | | 25.6% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: MICHIGAN

Michigan Executive Summary

The use of soybean meal as a key feed ingredient is a moderate part of Michigan's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Michigan. The success of Michigan animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Michigan during 2014 animal agriculture contributed:

- \$7.8 billion in economic output
- 46,481 jobs
- \$1.4 billion in earnings
- \$351.1 million in income taxes paid at local, state, and federal levels
- \$217.5 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Michigan increased economic output by over \$3.3 billion, boosted household earnings by \$599.8 million, contributed 19,636 additional jobs and paid \$147.4 million in additional tax revenues.

Michigan's animal agriculture consumed about 564.5 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (292.9 thousand tons)
- Hogs (120.5 thousand tons)
- Egg-Laying Hens (81.7 thousand tons)

This report examines animal agriculture in Michigan over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Michigan, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Michigan and beyond.

Michigan Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Michigan's economy. In 2014, Michigan's animal agriculture contributed the following to the economy:

- About \$7,822.3 million in economic output
- \$1,428.3 million in household earnings
- 46,481 jobs
- \$351.1 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Michigan's animal agriculture has:

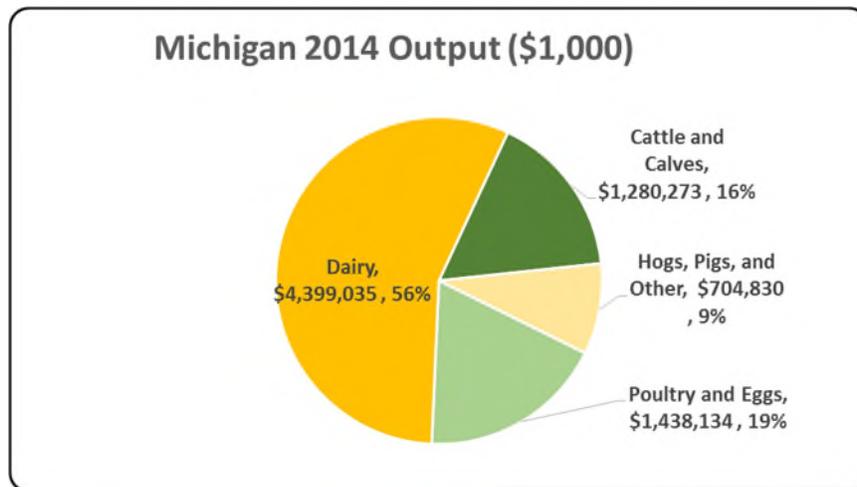
- Increased economic output by \$3,283.1 million
- Boosted household earnings by \$599.8 million
- Added 19,636 jobs
- Paid an additional \$147.4 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 7,822,271 | \$ 3,283,140 | 72.33% |
| Earnings (\$1,000) | \$ 1,428,315 | \$ 599,809 | 72.40% |
| Employment (Jobs) | 46,481 | 19,636 | 73.15% |
| Income Taxes Paid (\$1,000) | \$ 351,080 | \$ 147,433 | 72.40% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 217,503 | | |

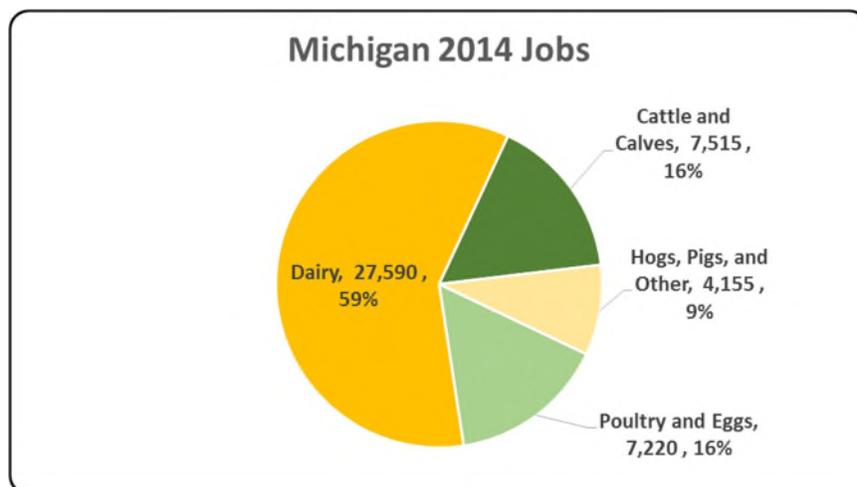
Michigan Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Michigan economy. Animal agriculture’s impact on Michigan total economic output is about \$7.8 billion.



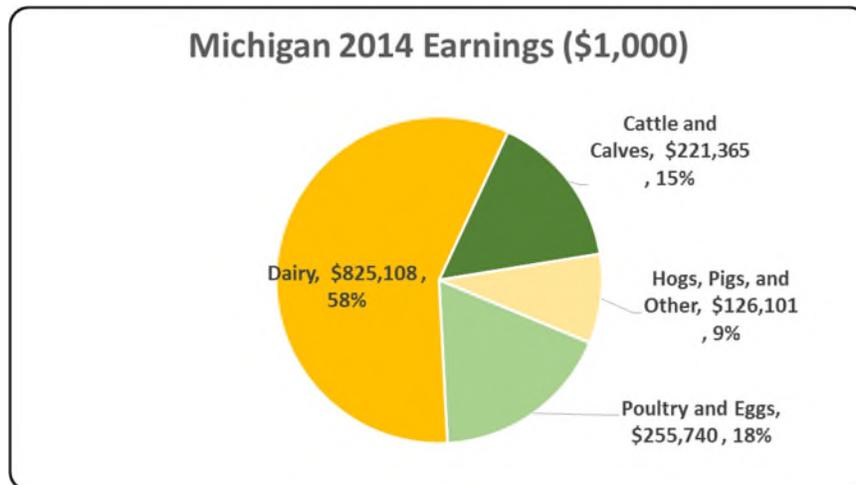
Michigan Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Michigan in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Michigan total jobs, contributing 46,481 jobs within and outside of animal agriculture.



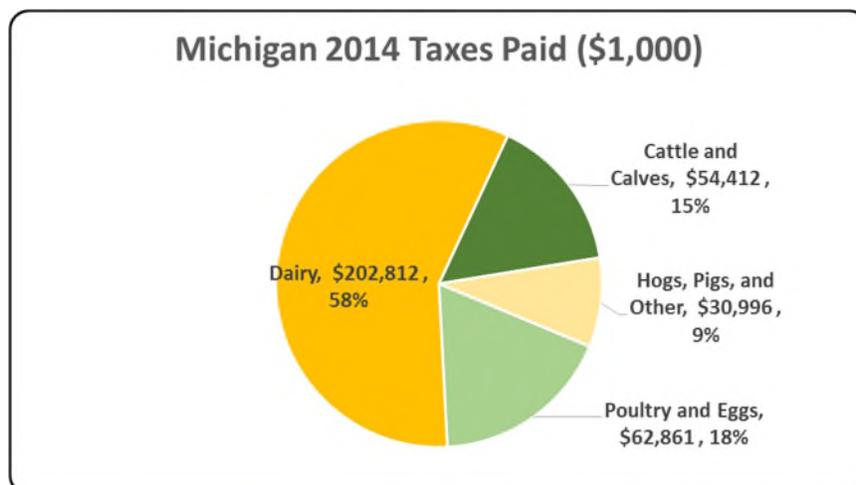
Michigan Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Michigan economy in terms of earnings. Michigan's animal agriculture contributed about \$1.4 billion to household earnings in 2014.



Michigan Taxes Paid by Animal Agriculture

Michigan's animal agriculture is also a significant source of tax revenue. In 2014, the state's animal agriculture industry paid about \$351.1 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$217.5 million in property taxes paid by all of Michigan agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



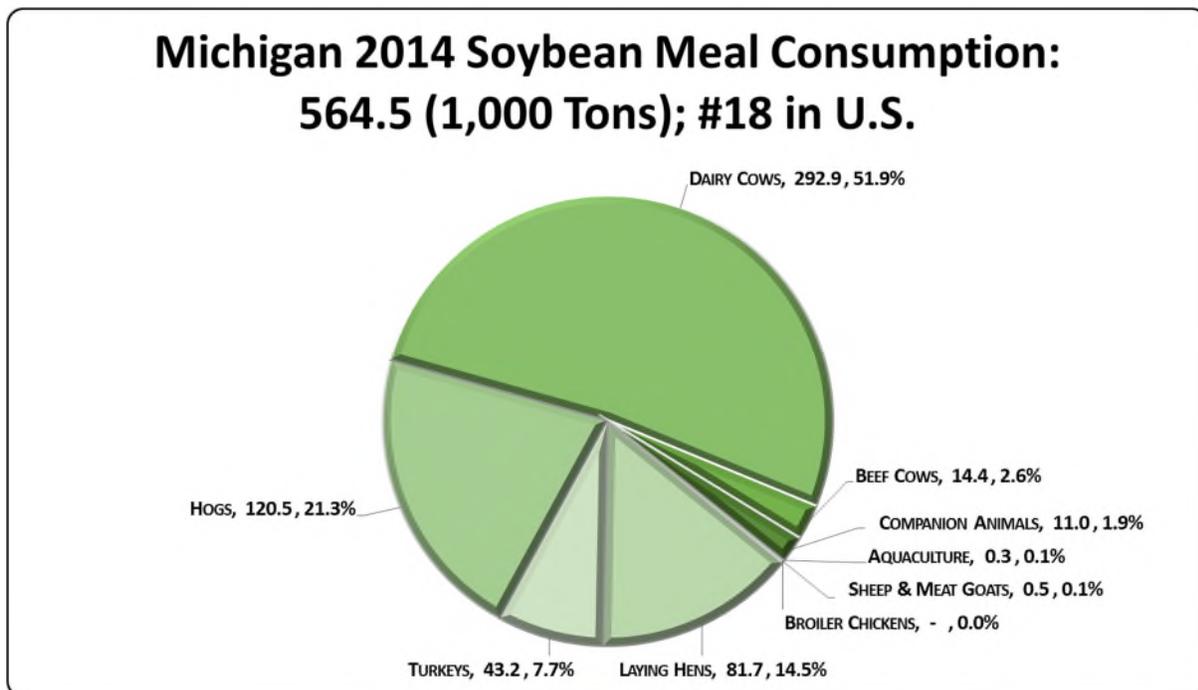
Michigan Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Michigan’s animal agriculture consumed almost 564.5 thousand tons of soybean meal in 2014, placing the state as #18 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (292.9 thousand tons)
- Hogs (120.5 thousand tons)
- Egg-Laying Hens (81.7 thousand tons)

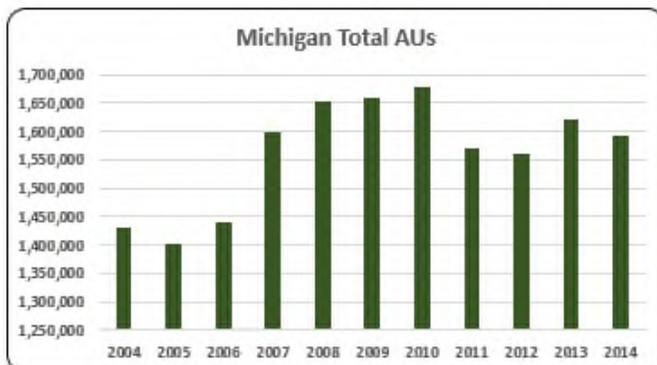
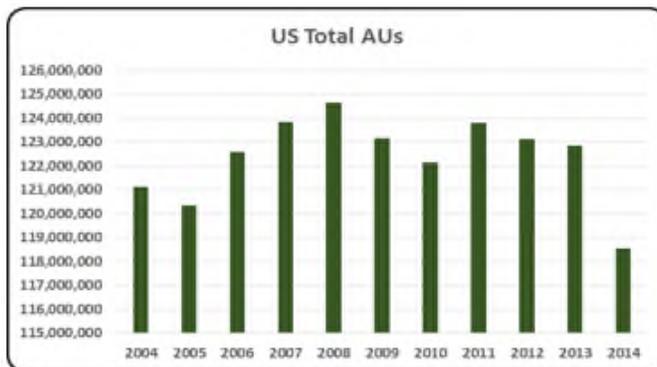


Michigan Animal Unit (AU) Trends

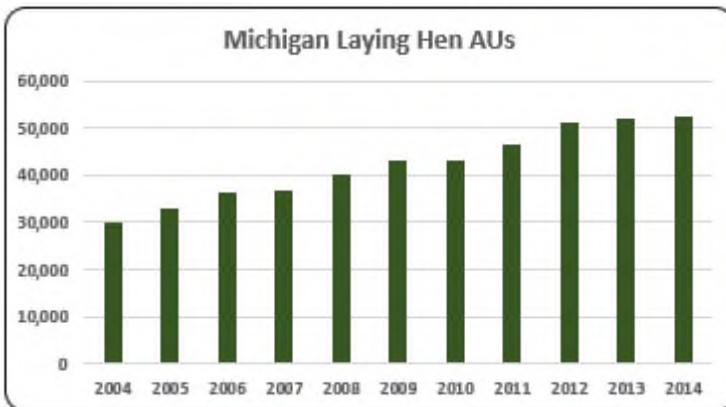
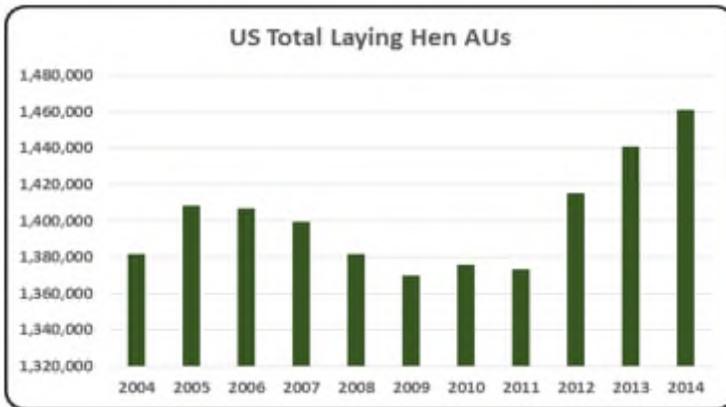
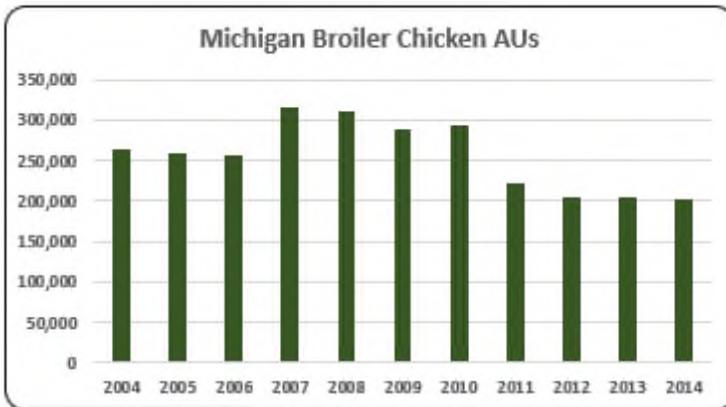
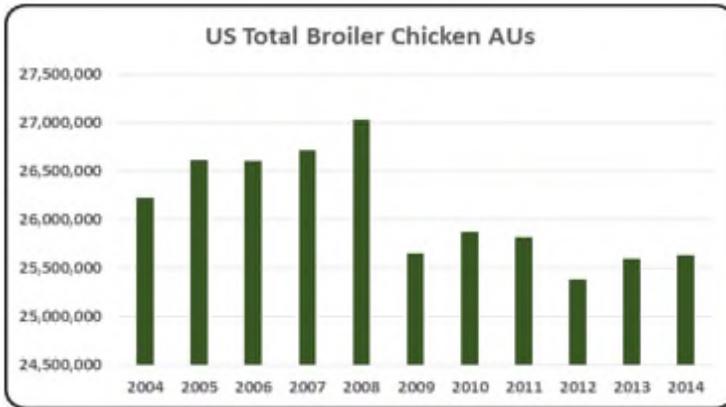
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Michigan. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Michigan and to give perspective on Michigan’s contribution to the nation’s animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

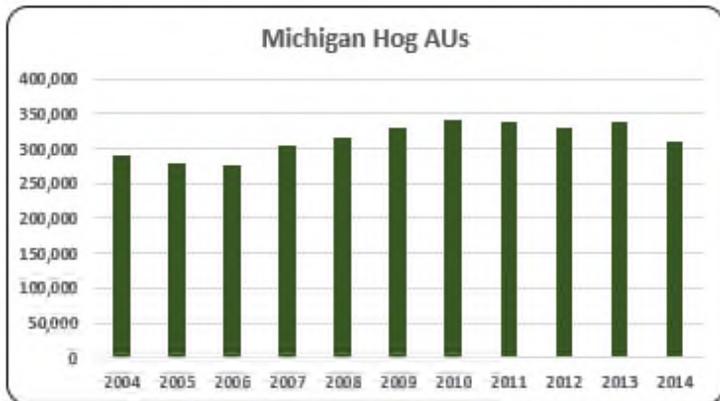
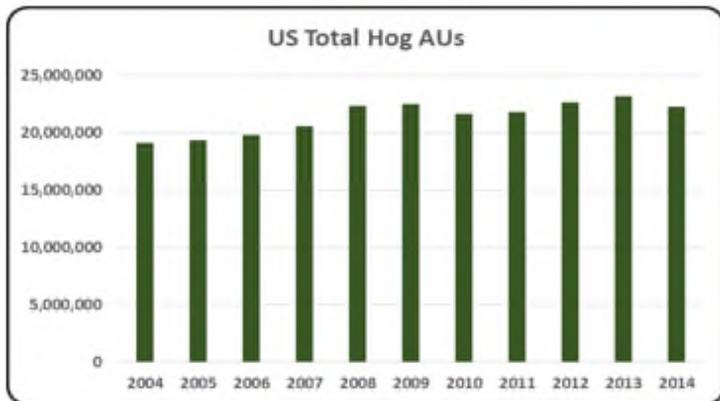
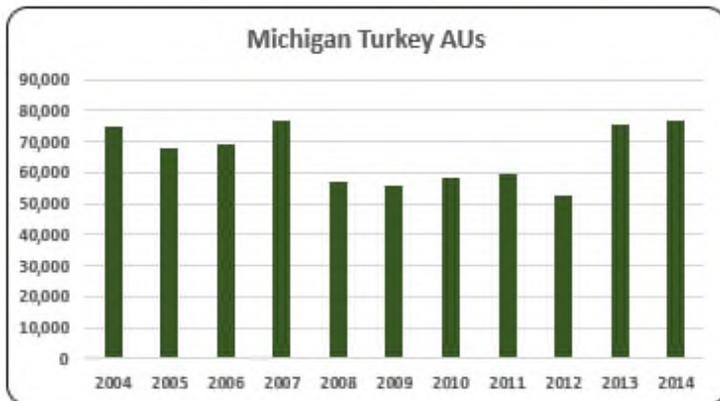
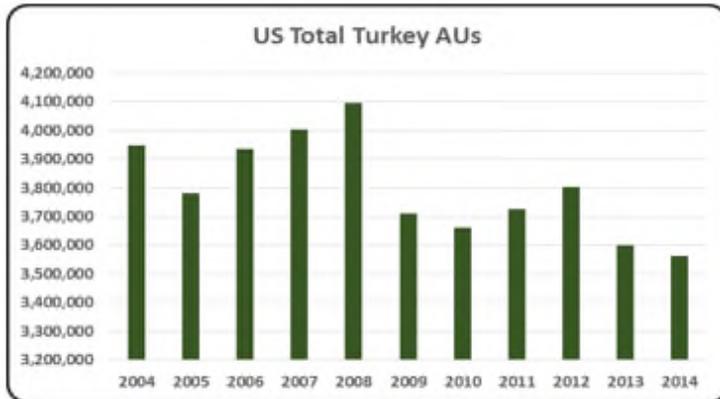
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Michigan, the largest three segments of animal agriculture in terms of AUs during 2014 were: Dairy Cows (533.4 thousand AUs), Beef Cows (415.1 thousand AUs), and Hogs (310.5 thousand AUs). Total animal units in Michigan during 2014 were 1,590.9 thousand AUs.



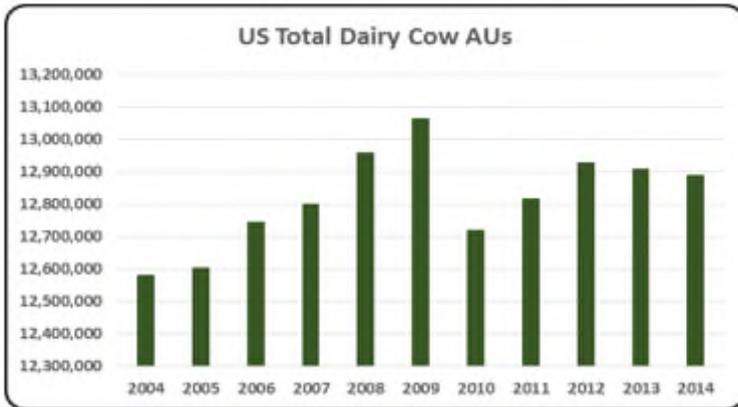
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- About 1.34% (1,590.9 thousand) of all AUs in the U.S. in 2014 were contributed by Michigan. Animal production grew 17% from 2004 to 2010; but production declined since then. 2014 animal production was about 95% of 2010.



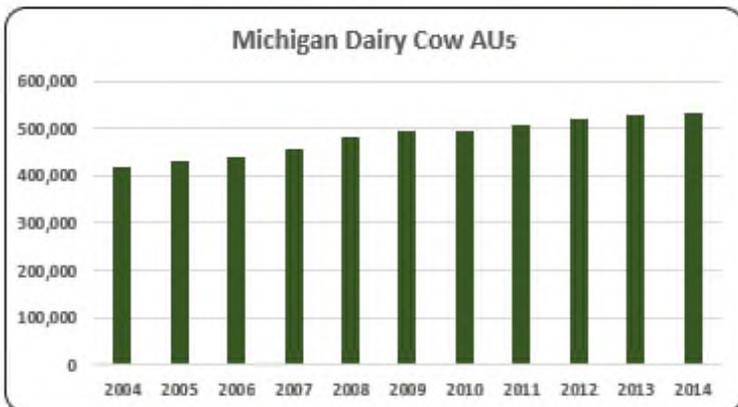
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production in Michigan dwindled starting in 2010. Broiler AUs were at 203,169 which is 64% of the record high production in 2007.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layer production in Michigan substantially increased (75%) from 29,928 layer AUs in 2004 to 52,340 layer AUs in 2014. 2014 turkey production represented 3.3% of all animal production in that year.



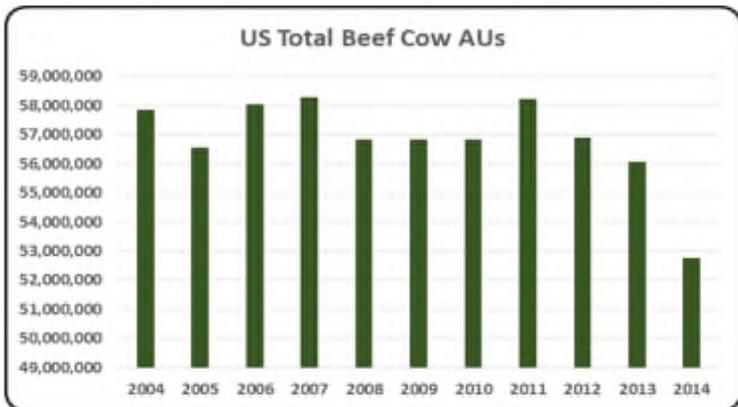
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production in Michigan declined in the middle of the decade to an average of 56,656 turkey AUs. In 2013 and 2014 turkey production increased averaging about 75,893 turkey AUs.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- About 19.5% (310,500) of all animal production in Michigan in 2014 was from hog production. Hog production increased 7% from 2004 (290,850 hog AUs).



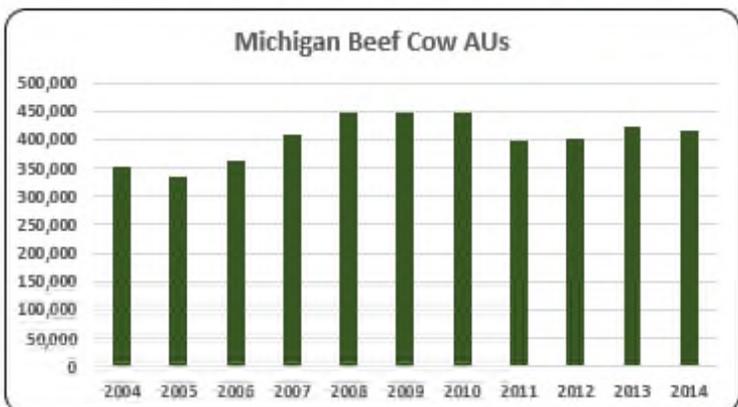
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cows contributed 33.5% (533,400) to the animal production in Michigan in 2014 and represented 4.1% of all dairy cow production in the U.S. The industry has shown an upward trend increasing 27%.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- There were 415,050 beef cow AUs in 2014 representing 26.09% of animal production in the state of Michigan. Beef cow production has expanded 18% since 2004.

Michigan Additional Information and Methodology

Animal agriculture is an important part of Michigan's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Michigan, of interest is the degree to which the industry impacts the Michigan economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Michigan animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Michigan's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Michigan which have occurred. As shown in this state report, Michigan has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Michigan. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Michigan Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Michigan's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Michigan, \$1.763 to \$2.031 million in total economic activity, \$0.315 to \$0.356 in household wages and 10 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.0306 | \$ 0.3511 | 11.9 |
| | Hogs, Pigs, and Other | \$ 1.7629 | \$ 0.3154 | 10.4 |
| | Poultry and Eggs | \$ 1.9502 | \$ 0.3468 | 9.8 |
| | Dairy | \$ 1.8996 | \$ 0.3563 | 11.9 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 351,000 | 335,550 | 363,450 | 408,300 | 447,660 | 447,660 | 447,660 | 398,700 | 401,400 | 421,950 | 415,050 |
| | Hog and Pig AUs | 290,850 | 278,100 | 275,400 | 303,600 | 314,550 | 330,750 | 340,350 | 337,800 | 330,150 | 339,450 | 310,500 |
| | Broiler AUs | 263,357 | 257,813 | 256,073 | 315,782 | 310,857 | 289,024 | 292,912 | 220,712 | 205,045 | 204,329 | 203,169 |
| | Turkey AUs | 75,000 | 67,856 | 69,380 | 77,006 | 57,103 | 55,934 | 58,262 | 59,301 | 52,682 | 75,311 | 76,475 |
| | Egg Layer AUs | 29,928 | 33,040 | 36,408 | 36,688 | 40,016 | 42,928 | 43,076 | 46,612 | 51,218 | 52,071 | 52,340 |
| | Dairy AUs | 420,000 | 429,800 | 439,600 | 457,800 | 481,600 | 494,200 | 495,600 | 505,400 | 519,400 | 527,800 | 533,400 |
| | Total Animal Units | 1,430,135 | 1,402,160 | 1,440,311 | 1,599,176 | 1,651,786 | 1,660,496 | 1,677,860 | 1,568,525 | 1,559,895 | 1,620,912 | 1,590,935 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 250,766 | \$ 259,915 | \$ 266,622 | \$ 314,853 | \$ 334,715 | \$ 284,066 | \$ 348,948 | \$ 418,199 | \$ 464,842 | \$ 518,536 | \$ 630,490 |
| | Hogs and Pigs (\$1,000) | \$ 220,981 | \$ 219,390 | \$ 201,668 | \$ 223,478 | \$ 242,596 | \$ 221,066 | \$ 307,177 | \$ 403,124 | \$ 349,236 | \$ 377,604 | \$ 393,428 |
| | Broilers (\$1,000) | \$ 221,506 | \$ 209,820 | \$ 162,145 | \$ 237,557 | \$ 244,486 | \$ 211,776 | \$ 222,903 | \$ 196,390 | \$ 204,260 | \$ 248,841 | \$ 261,042 |
| | Turkeys (\$1,000) | \$ 69,560 | \$ 67,500 | \$ 82,156 | \$ 88,210 | \$ 77,126 | \$ 51,724 | \$ 69,296 | \$ 77,720 | \$ 76,405 | \$ 140,049 | \$ 151,065 |
| | Eggs (\$1,000) | \$ 94,313 | \$ 61,870 | \$ 73,097 | \$ 155,371 | \$ 217,526 | \$ 156,701 | \$ 170,763 | \$ 198,496 | \$ 239,603 | \$ 271,400 | \$ 325,322 |
| | Milk (\$1,000) | \$ 1,031,790 | \$ 1,039,500 | \$ 946,295 | \$ 1,502,125 | \$ 1,490,496 | \$ 1,067,712 | \$ 1,416,610 | \$ 1,780,380 | \$ 1,699,299 | \$ 1,878,620 | \$ 2,315,769 |
| | Other | \$ 6,584 | \$ 7,095 | \$ 5,623 | \$ 6,367 | \$ 6,099 | \$ 6,394 | \$ 6,835 | \$ 6,403 | \$ 6,397 | \$ 6,391 | \$ 6,385 |
| | Sheep and Lambs (\$1,000) | \$ 4,077 | \$ 4,697 | \$ 3,334 | \$ 4,186 | \$ 4,027 | \$ 4,430 | \$ 4,980 | \$ 4,657 | \$ 4,759 | \$ 4,862 | \$ 4,964 |
| | Aquaculture (\$1,000) | \$ 2,507 | \$ 2,398 | \$ 2,289 | \$ 2,181 | \$ 2,072 | \$ 1,964 | \$ 1,855 | \$ 1,746 | \$ 1,638 | \$ 1,529 | \$ 1,420 |
| | Total (\$1,000) | \$ 1,895,499 | \$ 1,865,090 | \$ 1,737,606 | \$ 2,527,961 | \$ 2,613,045 | \$ 1,999,439 | \$ 2,542,531 | \$ 3,080,712 | \$ 3,040,043 | \$ 3,441,441 | \$ 4,083,501 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 4,765 | 4,115 | 5,253 | 6,042 | |
| | Cattle feedlots (112112) | 1,791 | 2,232 | 1,481 | 344 | |
| | Dairy cattle and milk production (11212) | 3,177 | 2,489 | 1,971 | 1,672 | |
| | Hog and pig farming (1122) | 1,178 | 838 | 1,017 | 686 | |
| | Poultry and egg production (1123) | 400 | 604 | 1,635 | 1,146 | |
| | Sheep and goat farming (1124) | 681 | 942 | 1,241 | 1,419 | |
| | Animal aquaculture and other animal production (1125,1129) | 4,387 | 7,215 | 6,829 | 6,347 | |
| Value of Sales (\$1,000) | Cattle and Calves | 284,374 | 298,517 | 449,371 | 603,653 | |
| | Hogs and Pigs | 227,452 | 200,027 | 357,495 | 482,177 | |
| | Poultry and Eggs | 169,246 | 146,700 | 258,994 | 472,218 | |
| | Milk and Other Dairy Products | 646,771 | 697,920 | 1,285,571 | 1,540,609 | |
| | Aquaculture | 2,028 | 3,316 | 5,721 | 3,982 | |
| | Other (calculated) | 50,312 | 63,327 | 66,139 | 39,877 | |
| | Total | 1,380,183 | 1,409,807 | 2,423,291 | 3,142,516 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 11,086 | 11,647 | 11,151 | 12,053 | |
| | | \$1,000 | 175,474 | 196,578 | 308,543 | 326,573 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 5,274 | 4,442 | 4,980 | |
| | | \$1,000 | <i>n/a</i> | 31,345 | 68,144 | 79,605 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 7,934 | 8,184 | 8,785 | |
| | | \$1,000 | <i>n/a</i> | 165,233 | 240,399 | 246,968 |
| Feed purchased | (Farms) | 17,888 | 24,297 | 22,314 | 24,389 | |
| | \$1,000 | 414,770 | 390,264 | 740,126 | 1,240,433 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|---------------------|---------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,280,273 | \$ 221,365 | 7,515 | \$ 54,412 |
| | Hogs, Pigs, and Other | \$ 704,830 | \$ 126,101 | 4,155 | \$ 30,996 |
| | Poultry and Eggs | \$ 1,438,134 | \$ 255,740 | 7,220 | \$ 62,861 |
| | Dairy | \$ 4,399,035 | \$ 825,108 | 27,590 | \$ 202,812 |
| | Total | \$ 7,822,271 | \$ 1,428,315 | 46,481 | \$ 351,080 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 642,119 | \$ 111,025 | 3,769 | \$ 27,290 |
| | Hogs, Pigs, and Other | \$ 202,065 | \$ 36,151 | 1,191 | \$ 8,886 |
| | Poultry and Eggs | \$ 496,246 | \$ 88,246 | 2,491 | \$ 21,691 |
| | Dairy | \$ 1,942,710 | \$ 364,386 | 12,184 | \$ 89,566 |
| | Total | \$ 3,283,140 | \$ 599,809 | 19,636 | \$ 147,433 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.0306 | \$ 0.3511 | 11.9 | |
| | Hogs, Pigs, and Other | \$ 1.7629 | \$ 0.3154 | 10.4 | |
| | Poultry and Eggs | \$ 1.9502 | \$ 0.3468 | 9.8 | |
| | Dairy | \$ 1.8996 | \$ 0.3563 | 11.9 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 4.3% |
| | Total | | | | 24.6% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: MINNESOTA

Minnesota Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Minnesota's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Minnesota. The success of Minnesota animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Minnesota during 2014 animal agriculture contributed:

- \$20.2 billion in economic output
- 88,167 jobs
- \$3.6 billion in earnings
- \$976.8 million in income taxes paid at local, state, and federal levels
- \$340.7 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Minnesota increased economic output by over \$6.2 billion, boosted household earnings by \$1.1 billion, contributed 26,985 additional jobs and paid \$298.6 million in additional tax revenues.

Minnesota's animal agriculture consumed about 1.6 million tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (879.9 thousand tons)
- Turkeys (385.6 thousand tons)
- Dairy Cows (176.0 thousand tons)

This report examines animal agriculture in Minnesota over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Minnesota, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Minnesota and beyond.

Minnesota Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Minnesota's economy. In 2014, Minnesota's animal agriculture contributed the following to the economy:

- About \$20.2 billion in economic output
- \$3.6 billion in household earnings
- 88,167 jobs
- \$976.8 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Minnesota's animal agriculture has:

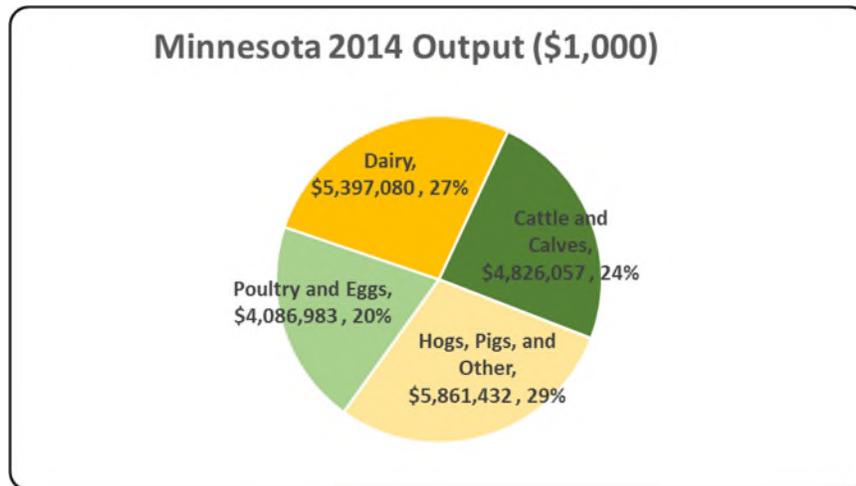
- Increased economic output by \$6.2 billion
- Boosted household earnings by \$1.1 billion
- Added 26,985 jobs
- Paid an additional \$298.6 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 20,171,552 | \$ 6,186,928 | 44.24% |
| Earnings (\$1,000) | \$ 3,567,606 | \$ 1,090,668 | 44.03% |
| Employment (Jobs) | 88,167 | 26,985 | 44.11% |
| Income Taxes Paid (\$1,000) | \$ 976,811 | \$ 298,625 | 44.03% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 340,686 | | |

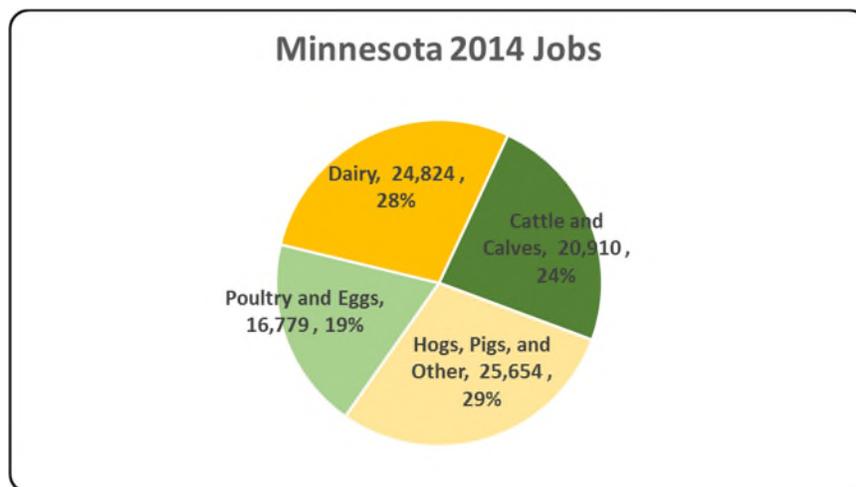
Minnesota Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Minnesota economy. Animal agriculture’s impact on Minnesota total economic output is about \$20.2 billion.



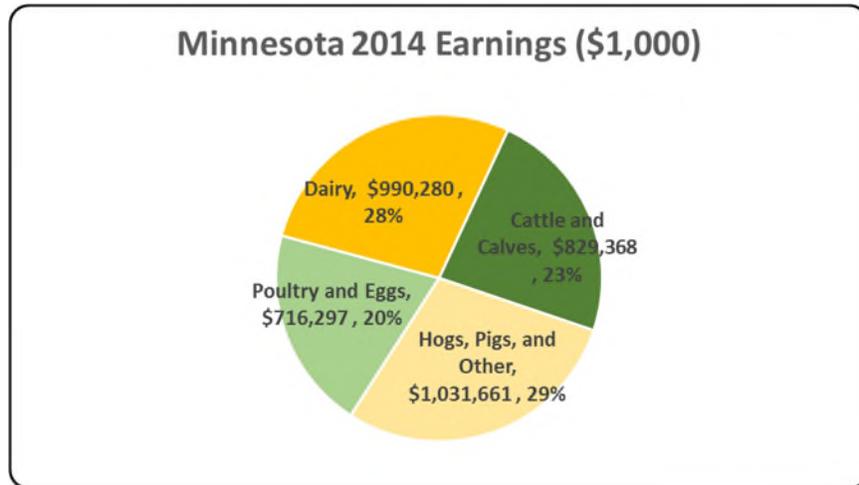
Minnesota Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Minnesota in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Minnesota total jobs, contributing 88,167 jobs within and outside of animal agriculture.



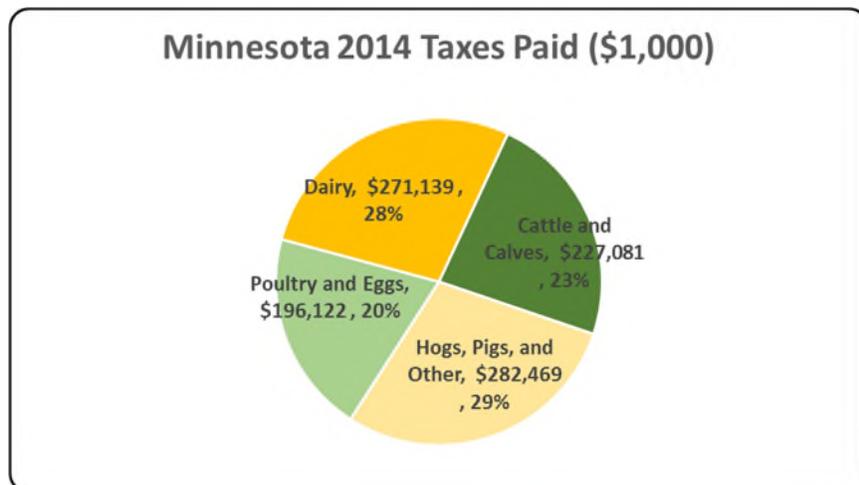
Minnesota Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Minnesota economy in terms of earnings. Minnesota’s animal agriculture contributed about \$3.6 billion to household earnings in 2014.



Minnesota Taxes Paid by Animal Agriculture

Minnesota’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$976.8 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$340.7 million in property taxes paid by all of Minnesota agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



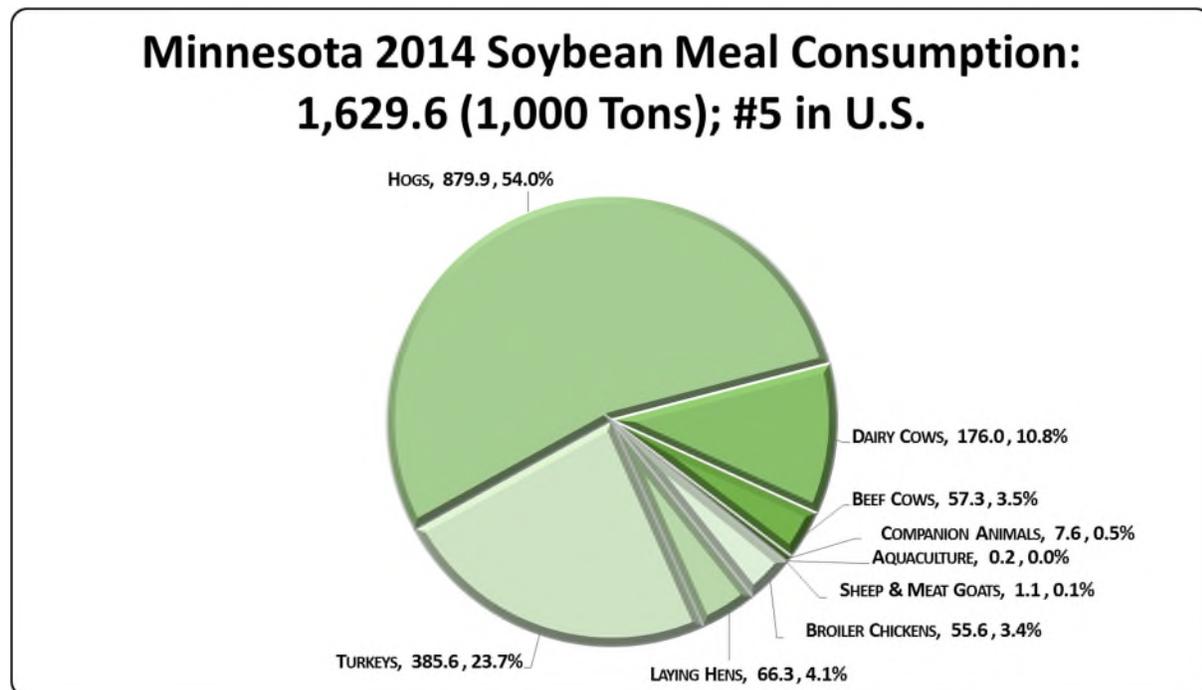
Minnesota Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Minnesota's animal agriculture consumed almost 1.6 million tons of soybean meal in 2014, placing the state as #5 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (879.9 thousand tons)
- Turkeys (385.6 thousand tons)
- Dairy Cows (176.0 thousand tons)

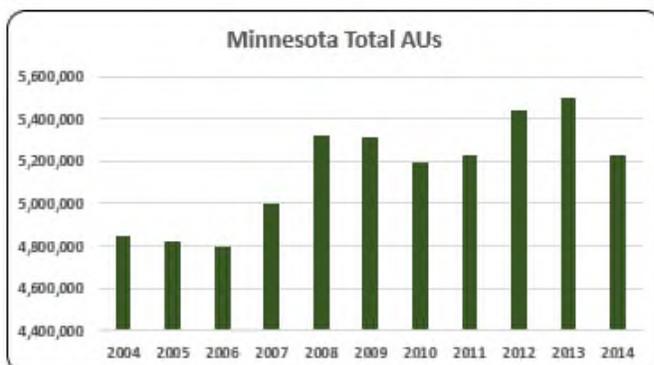
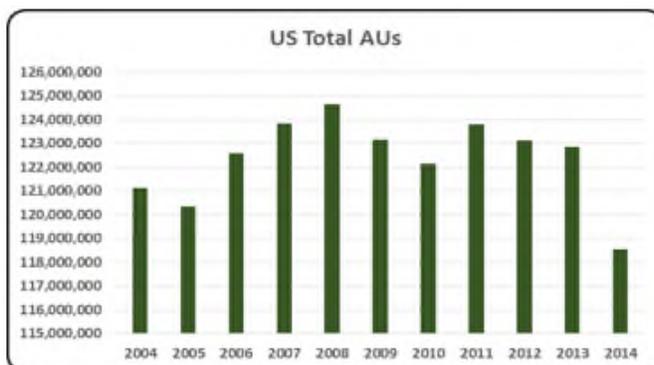


Minnesota Animal Unit (AU) Trends

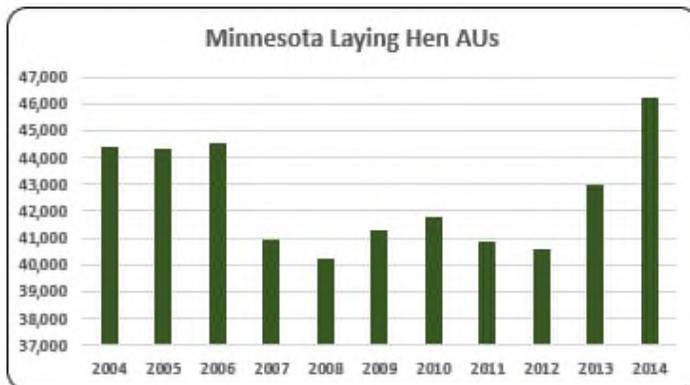
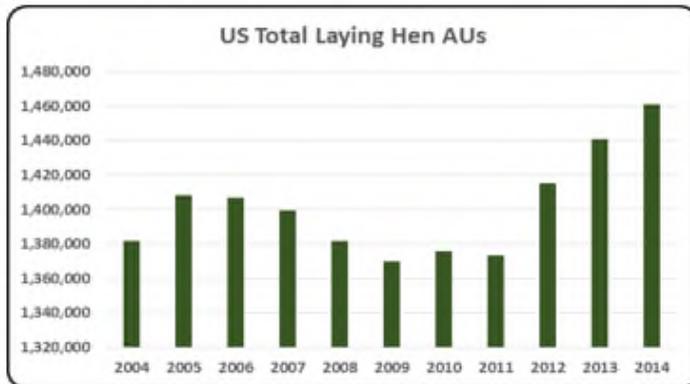
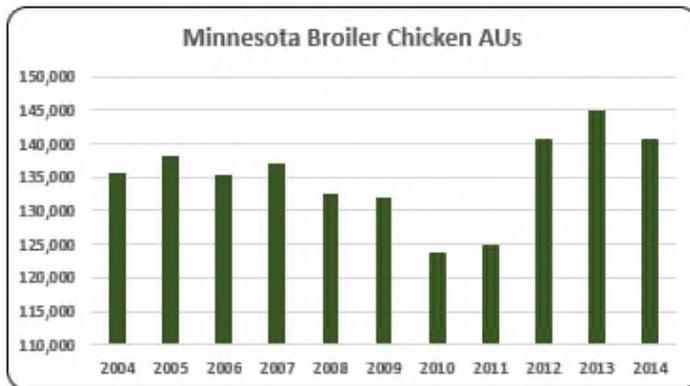
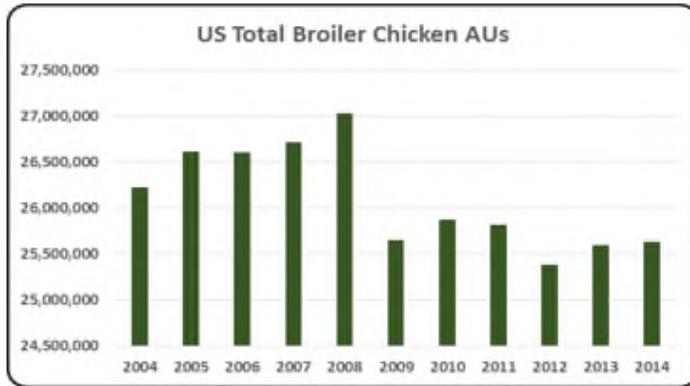
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Minnesota. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Minnesota and to give perspective on Minnesota's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Minnesota, the largest three segments of animal agriculture in terms of AUs during 2014 were: Hogs (2,594.4 thousand AUs), Beef Cows (1,120.5 thousand AUs), and Turkeys (682.3 thousand AUs). Total animal units in Minnesota during 2014 were 5,228.1 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- At the national level, Minnesota is the number one turkey producer. The overall animal production in Minnesota was positive during the decade; however AUs dropped about 5.0% from the previous year. There were 5,228.0 thousand AUs in the state in 2014.

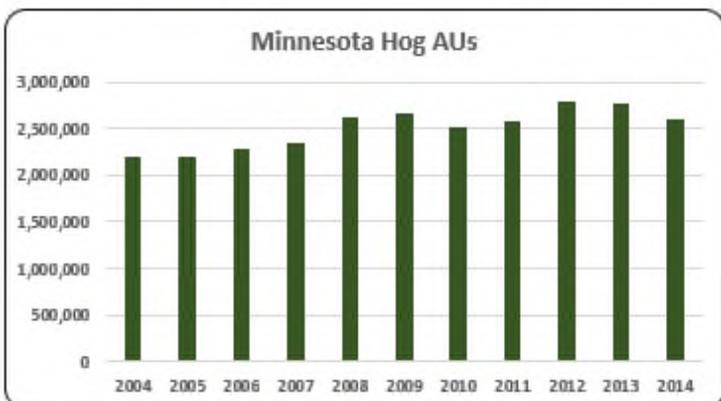
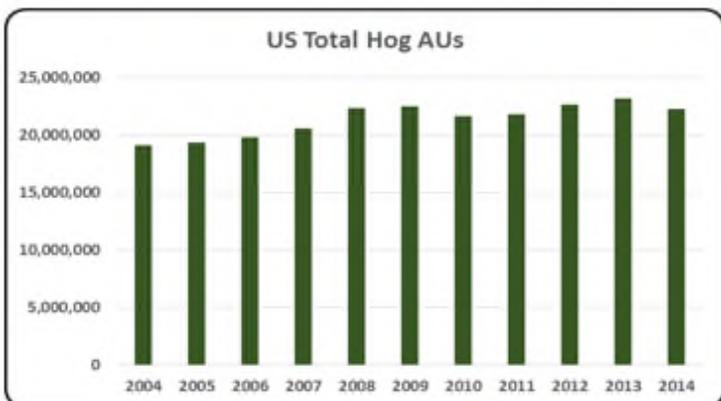
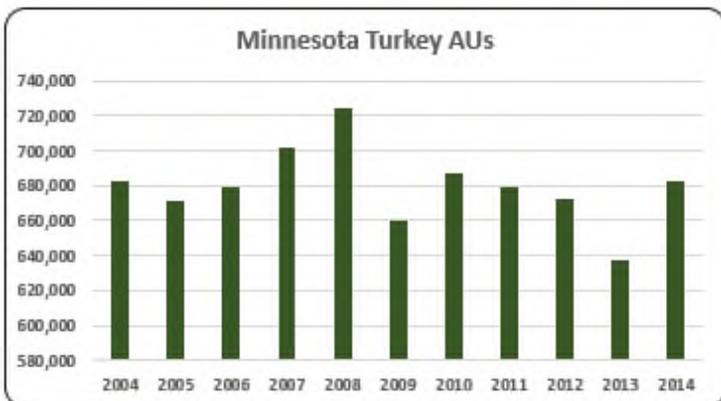
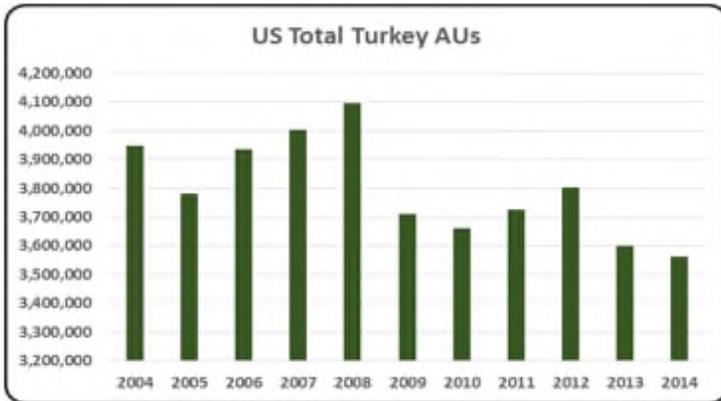


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

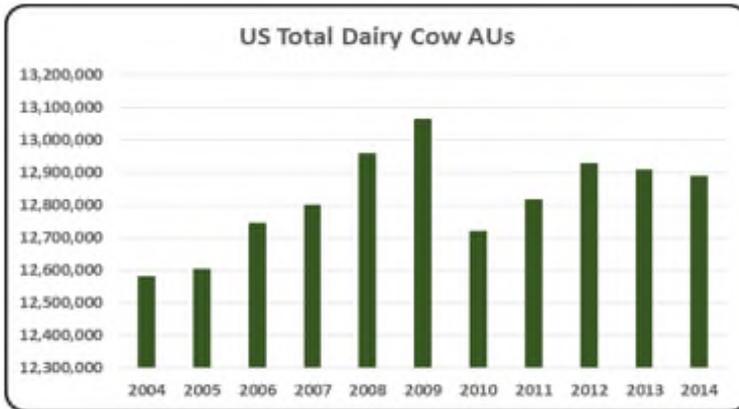
- Broiler production decreased about 3.0% to 140,659 broiler AUs in 2014. Broiler AUs averaged 135,027 from 2004 to 2014.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

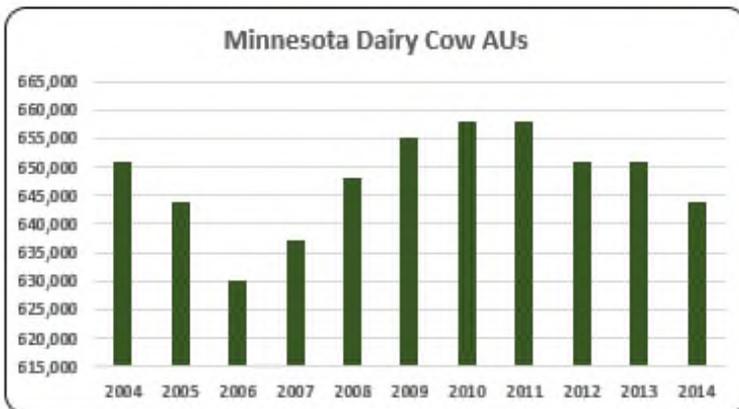
- Layer production in the state is the smallest animal production in the state with 46,224 layer AUs in 2014. Layer production has varied during the decade but production in 2014 was a record high.



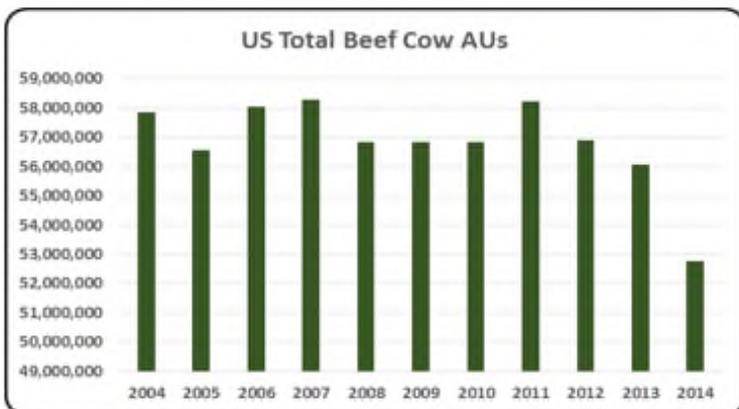
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- There were 682,280 turkey AUs in Minnesota in 2014 representing 19.2% of all turkey AUs in the country. Production in 2014 rose 7.1% relative to 2013.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- About 50% (2,594.4 thousand) of animal production in 2014 came from the production of hogs in Minnesota. Hog production plummeted 6.4% year-over-year but the overall trend during the decade has been positive.



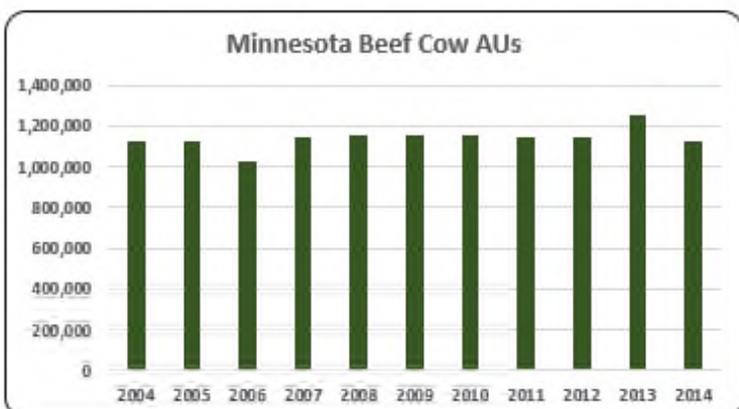
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- The dairy cow industry in Minnesota contributed 12.32% (644,000) of all animal production in the state in 2014. Dairy cow production in 2014 dropped 1.1% from last previous year.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production was second largest animal production in the state of Minnesota in 2014 with 1,120.5 thousand beef cow AUs. Beef cow production fell 10.4% year-over-year but in general production during the decade has been steady at an average of 1,141.8 beef cow AUs.

Minnesota Additional Information and Methodology

Animal agriculture is an important part of Minnesota's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Minnesota, of interest is the degree to which the industry impacts the Minnesota economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Minnesota animal agriculture are presented in this report.

Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Minnesota's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Minnesota which have occurred. As shown in this state report, Minnesota has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Minnesota. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Minnesota Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Minnesota's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Minnesota, \$2.087 to \$3.118 million in total economic activity, \$0.367 to \$0.546 in household wages and 9 to 13 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 3.0084 | \$ 0.5170 | 13.0 |
| | Hogs, Pigs, and Other | \$ 2.0874 | \$ 0.3674 | 9.1 |
| | Poultry and Eggs | \$ 3.1176 | \$ 0.5464 | 12.8 |
| | Dairy | \$ 2.3844 | \$ 0.4375 | 11.0 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,127,550 | 1,128,000 | 1,029,900 | 1,139,700 | 1,158,300 | 1,158,300 | 1,158,300 | 1,147,500 | 1,141,500 | 1,250,100 | 1,120,500 |
| | Hog and Pig AUs | 2,206,350 | 2,197,050 | 2,277,900 | 2,342,100 | 2,614,500 | 2,668,350 | 2,522,700 | 2,580,600 | 2,797,800 | 2,770,950 | 2,594,400 |
| | Broiler AUs | 135,550 | 138,191 | 135,209 | 137,053 | 132,392 | 131,820 | 123,892 | 124,988 | 140,671 | 144,872 | 140,659 |
| | Turkey AUs | 682,500 | 671,025 | 678,719 | 702,114 | 724,661 | 659,393 | 687,546 | 679,217 | 671,956 | 637,247 | 682,280 |
| | Egg Layer AUs | 44,412 | 44,360 | 44,520 | 40,928 | 40,256 | 41,324 | 41,796 | 40,868 | 40,568 | 43,004 | 46,224 |
| | Dairy AUs | 651,000 | 644,000 | 630,000 | 637,000 | 648,200 | 655,200 | 658,000 | 658,000 | 651,000 | 651,000 | 644,000 |
| | Total Animal Units | 4,847,362 | 4,822,626 | 4,796,249 | 4,998,896 | 5,318,309 | 5,314,387 | 5,192,235 | 5,231,173 | 5,443,494 | 5,497,173 | 5,228,063 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 798,926 | \$ 841,789 | \$ 821,333 | \$ 886,145 | \$ 892,142 | \$ 800,217 | \$ 957,961 | \$ 1,020,618 | \$ 1,209,861 | \$ 1,287,089 | \$ 1,604,194 |
| | Hogs and Pigs (\$1,000) | \$ 1,509,688 | \$ 1,570,936 | \$ 1,501,906 | \$ 1,645,781 | \$ 1,757,315 | \$ 1,246,087 | \$ 1,848,944 | \$ 2,296,476 | \$ 2,410,425 | \$ 2,522,978 | \$ 2,784,251 |
| | Broilers (\$1,000) | \$ 101,860 | \$ 98,814 | \$ 82,620 | \$ 104,189 | \$ 109,480 | \$ 112,605 | \$ 111,390 | \$ 110,757 | \$ 135,700 | \$ 172,631 | \$ 178,870 |
| | Turkeys (\$1,000) | \$ 504,504 | \$ 540,675 | \$ 568,935 | \$ 633,516 | \$ 744,192 | \$ 580,500 | \$ 716,750 | \$ 792,825 | \$ 842,416 | \$ 749,056 | \$ 866,161 |
| | Eggs (\$1,000) | \$ 142,183 | \$ 90,899 | \$ 107,303 | \$ 193,219 | \$ 237,237 | \$ 165,025 | \$ 167,922 | \$ 185,335 | \$ 199,865 | \$ 214,011 | \$ 265,908 |
| | Milk (\$1,000) | \$ 1,353,034 | \$ 1,262,030 | \$ 1,088,100 | \$ 1,713,888 | \$ 1,677,362 | \$ 1,208,546 | \$ 1,465,422 | \$ 1,822,450 | \$ 1,778,308 | \$ 1,864,152 | \$ 2,263,496 |
| | Other | \$ 21,160 | \$ 23,195 | \$ 20,268 | \$ 22,434 | \$ 22,458 | \$ 20,893 | \$ 24,191 | \$ 23,039 | \$ 23,278 | \$ 23,517 | \$ 23,755 |
| | Sheep and Lambs (\$1,000) | \$ 12,398 | \$ 14,783 | \$ 12,205 | \$ 14,721 | \$ 15,094 | \$ 13,879 | \$ 17,526 | \$ 16,724 | \$ 17,312 | \$ 17,901 | \$ 18,489 |
| | Aquaculture (\$1,000) | \$ 8,762 | \$ 8,412 | \$ 8,063 | \$ 7,713 | \$ 7,364 | \$ 7,014 | \$ 6,665 | \$ 6,315 | \$ 5,966 | \$ 5,616 | \$ 5,267 |
| | Total (\$1,000) | \$ 4,431,355 | \$ 4,428,338 | \$ 4,190,465 | \$ 5,199,172 | \$ 5,440,186 | \$ 4,133,873 | \$ 5,292,580 | \$ 6,251,500 | \$ 6,599,853 | \$ 6,833,434 | \$ 7,986,635 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 10,243 | 8,917 | 9,921 | 8,083 | |
| | Cattle feedlots (112112) | 2,507 | 3,290 | 2,421 | 1,048 | |
| | Dairy cattle and milk production (11212) | 7,972 | 5,520 | 4,385 | 3,746 | |
| | Hog and pig farming (1122) | 3,800 | 3,051 | 2,462 | 1,442 | |
| | Poultry and egg production (1123) | 819 | 978 | 1,643 | 1,085 | |
| | Sheep and goat farming (1124) | 1,083 | 1,181 | 1,310 | 1,088 | |
| | Animal aquaculture and other animal production (1125,1129) | 3,172 | 6,006 | 5,105 | 4,245 | |
| Value of Sales (\$1,000) | Cattle and Calves | 737,972 | 873,074 | 1,385,740 | 1,639,634 | |
| | Hogs and Pigs | 1,436,247 | 1,398,234 | 2,139,877 | 2,783,049 | |
| | Poultry and Eggs | 744,509 | 750,088 | 1,045,674 | 1,230,625 | |
| | Milk and Other Dairy Products | 1,111,429 | 931,754 | 1,475,929 | 1,645,911 | |
| | Aquaculture | 3,221 | 8,991 | 12,492 | 12,678 | |
| | Other (calculated) | 58,910 | 50,604 | 71,842 | 73,874 | |
| | Total | 4,092,288 | 4,012,745 | 6,131,554 | 7,385,771 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 22,175 | 20,375 | 17,464 | 18,527 | |
| | | \$1,000 | 639,336 | 836,490 | 1,304,042 | 1,301,768 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 9,757 | 8,243 | 9,241 | |
| | | \$1,000 | <i>n/a</i> | 75,727 | 115,218 | 163,055 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 12,945 | 11,354 | 11,859 | |
| | | \$1,000 | <i>n/a</i> | 760,762 | 1,188,825 | 1,138,713 |
| Feed purchased | (Farms) | 35,429 | 37,871 | 30,806 | 32,486 | |
| | \$1,000 | 1,301,623 | 1,271,172 | 1,944,488 | 2,961,840 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 4,826,057 | \$ 829,368 | 20,910 | \$ 227,081 |
| | Hogs, Pigs, and Other | \$ 5,861,432 | \$ 1,031,661 | 25,654 | \$ 282,469 |
| | Poultry and Eggs | \$ 4,086,983 | \$ 716,297 | 16,779 | \$ 196,122 |
| | Dairy | \$ 5,397,080 | \$ 990,280 | 24,824 | \$ 271,139 |
| | Total | \$ 20,171,552 | \$ 3,567,606 | 88,167 | \$ 976,811 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 1,813,922 | \$ 311,726 | 7,859 | \$ 85,351 |
| | Hogs, Pigs, and Other | \$ 1,856,732 | \$ 326,801 | 8,126 | \$ 89,478 |
| | Poultry and Eggs | \$ 1,162,347 | \$ 203,717 | 4,772 | \$ 55,778 |
| | Dairy | \$ 1,353,927 | \$ 248,424 | 6,227 | \$ 68,019 |
| | Total | \$ 6,186,928 | \$ 1,090,668 | 26,985 | \$ 298,625 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 3.0084 | \$ 0.5170 | 13.0 | |
| | Hogs, Pigs, and Other | \$ 2.0874 | \$ 0.3674 | 9.1 | |
| | Poultry and Eggs | \$ 3.1176 | \$ 0.5464 | 12.8 | |
| | Dairy | \$ 2.3844 | \$ 0.4375 | 11.0 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 7.1% | |
| | Total | | | 27.4% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: MISSISSIPPI

Mississippi Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Mississippi's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Mississippi. The success of Mississippi animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Mississippi during 2014 animal agriculture contributed:

- \$10.3 billion in economic output
- 50,978 jobs
- \$1.7 billion in earnings
- \$435.1 million in income taxes paid at local, state, and federal levels
- \$78.3 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Mississippi increased economic output by over \$1.1 billion, boosted household earnings by \$187.3 million, contributed 5,367 additional jobs and paid \$47.4 million in additional tax revenues.

Mississippi's animal agriculture consumed about 1.2 million tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (1.0 million tons)
- Aquaculture (72.4 thousand tons)
- Hogs (49.0 thousand tons)

This report examines animal agriculture in Mississippi over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Mississippi, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Mississippi and beyond.

Mississippi Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Mississippi's economy. In 2014, Mississippi's animal agriculture contributed the following to the economy:

- About \$10.3 billion in economic output
- \$1.7 billion in household earnings
- 50,978 jobs
- \$435.1 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Mississippi's animal agriculture has:

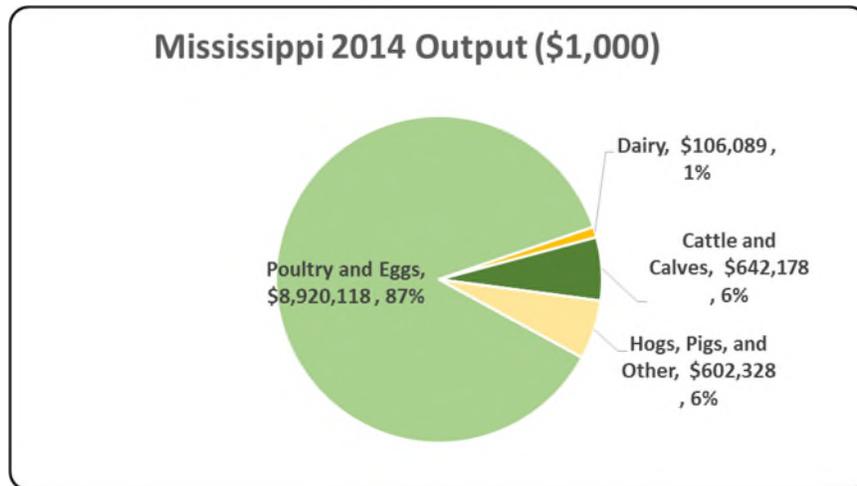
- Increased economic output by \$1.1 billion
- Boosted household earnings by \$187.3 million
- Added 5,367 jobs
- Paid an additional \$47.4 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 10,270,713 | \$ 1,126,527 | 12.32% |
| Earnings (\$1,000) | \$ 1,717,576 | \$ 187,314 | 12.24% |
| Employment (Jobs) | 50,978 | 5,367 | 11.77% |
| Income Taxes Paid (\$1,000) | \$ 435,062 | \$ 47,447 | 12.24% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 78,273 | | |

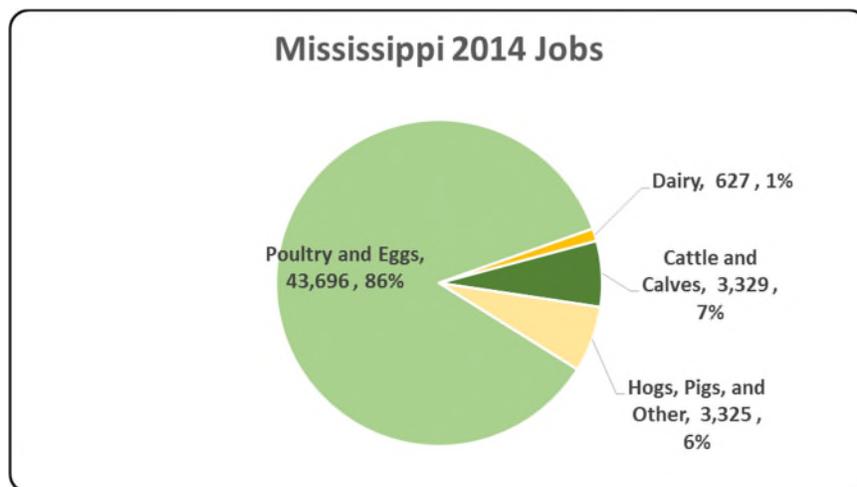
Mississippi Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Mississippi economy. Animal agriculture’s impact on Mississippi total economic output is about \$10.3 billion.



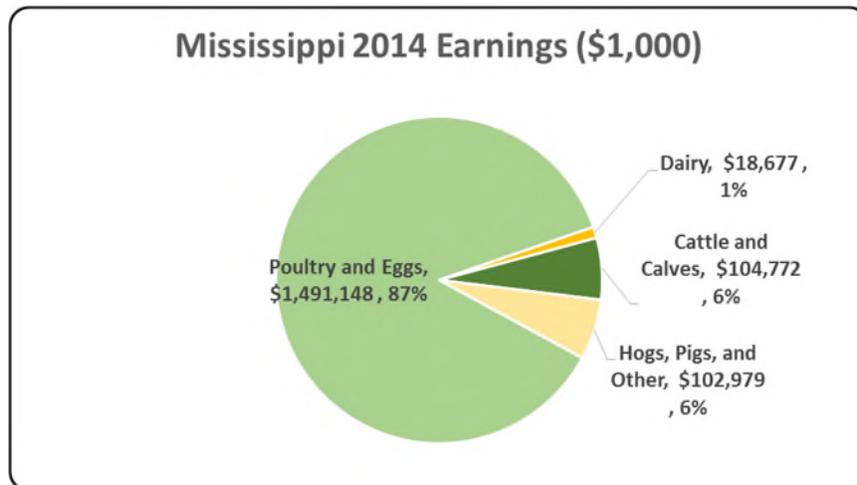
Mississippi Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Mississippi in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Mississippi total jobs, contributing 50,978 jobs within and outside of animal agriculture.



Mississippi Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Mississippi economy in terms of earnings. Mississippi’s animal agriculture contributed about \$1.7 billion to household earnings in 2014.



Mississippi Taxes Paid by Animal Agriculture

Mississippi’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$435.1 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$78.3 million in property taxes paid by all of Mississippi agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



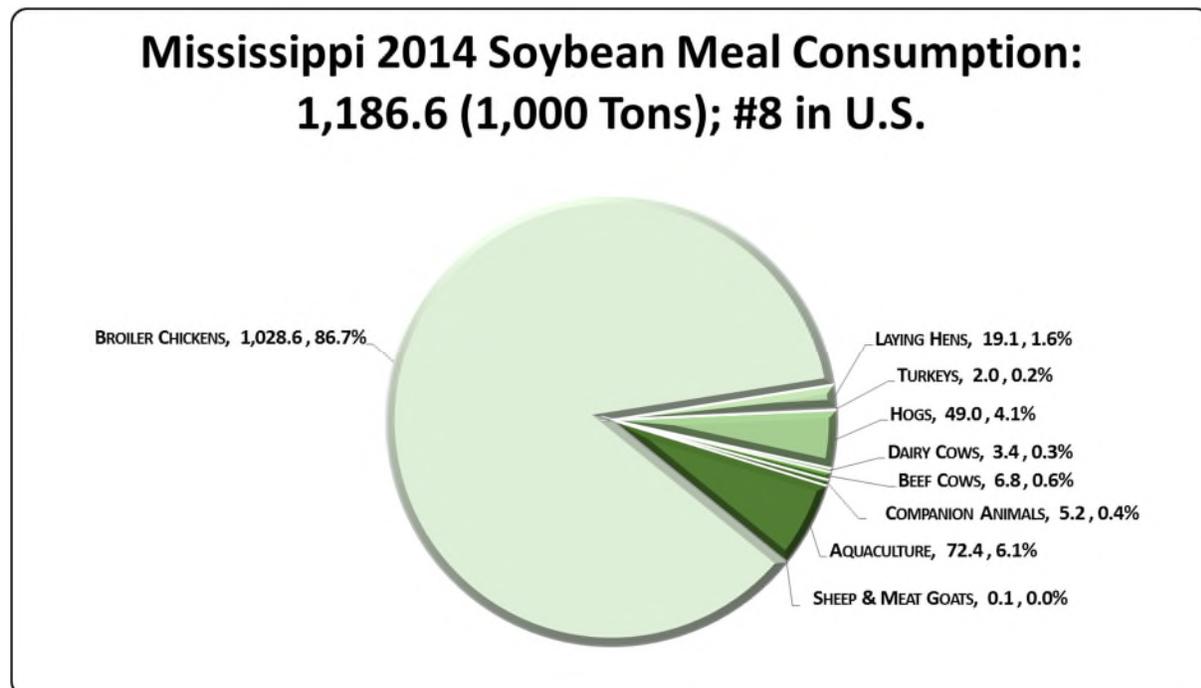
Mississippi Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Mississippi's animal agriculture consumed almost 1.2 million tons of soybean meal in 2014, placing the state as #8 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (1.0 million tons)
- Aquaculture (72.4 thousand tons)
- Hogs (49.0 thousand tons)

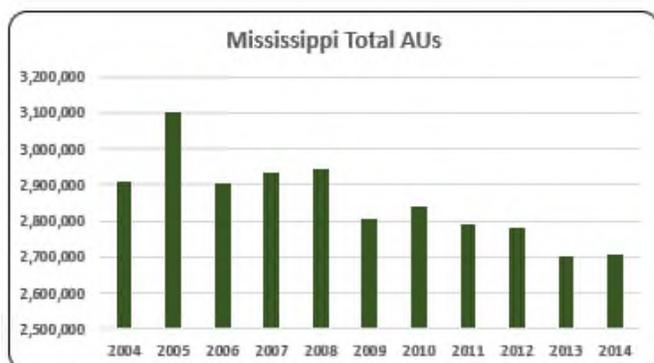
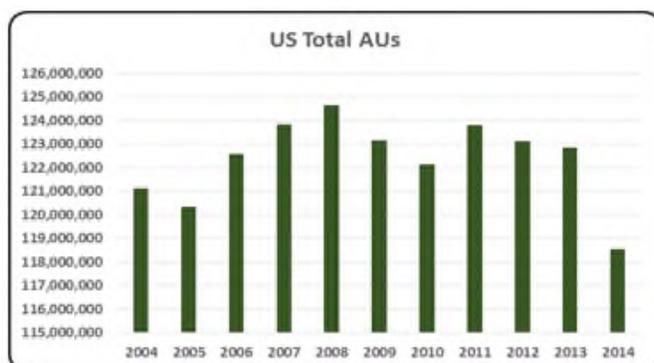


Mississippi Animal Unit (AU) Trends

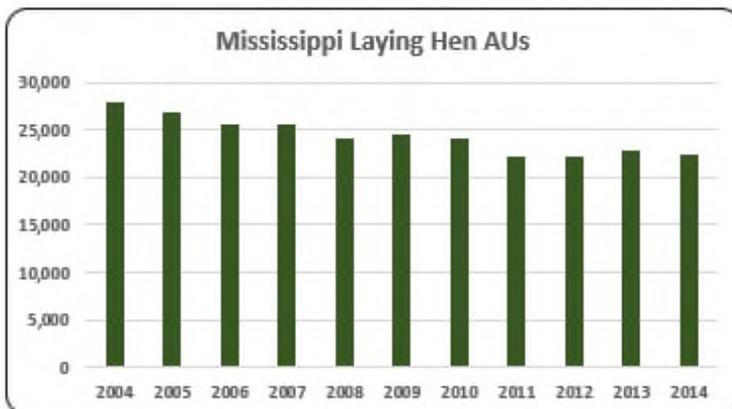
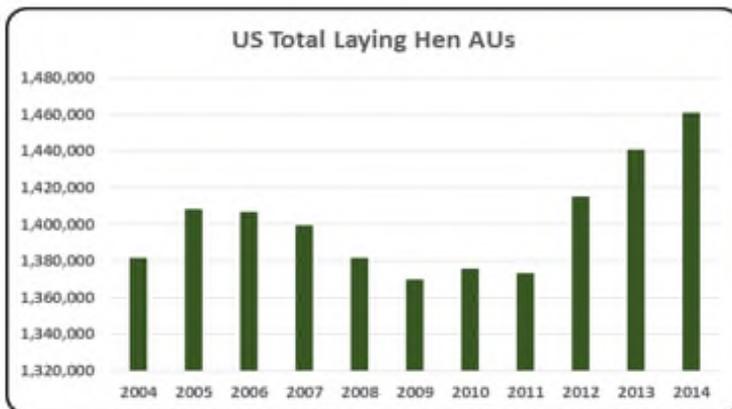
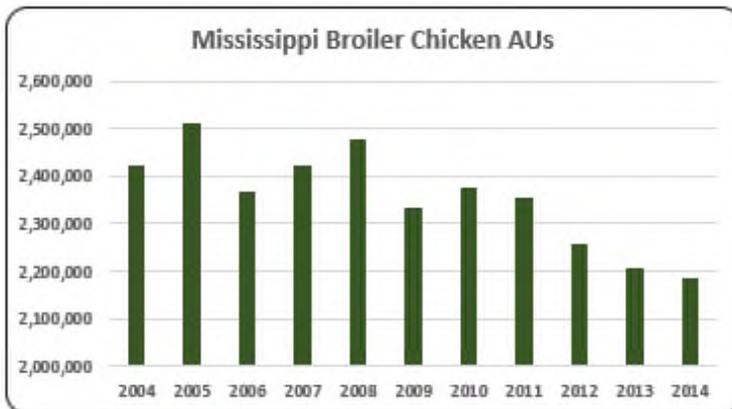
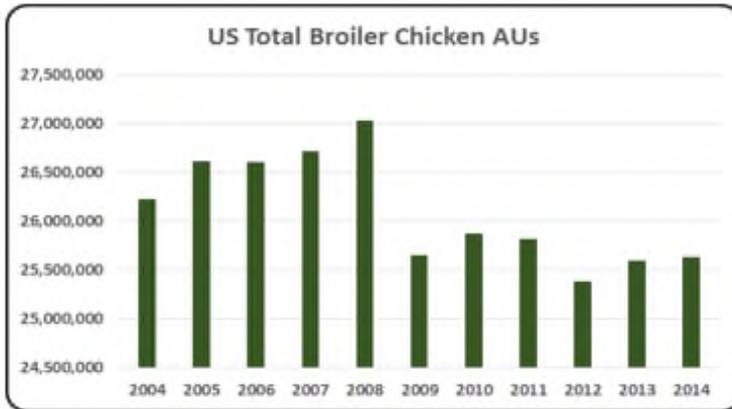
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Mississippi. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Mississippi and to give perspective on Mississippi's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

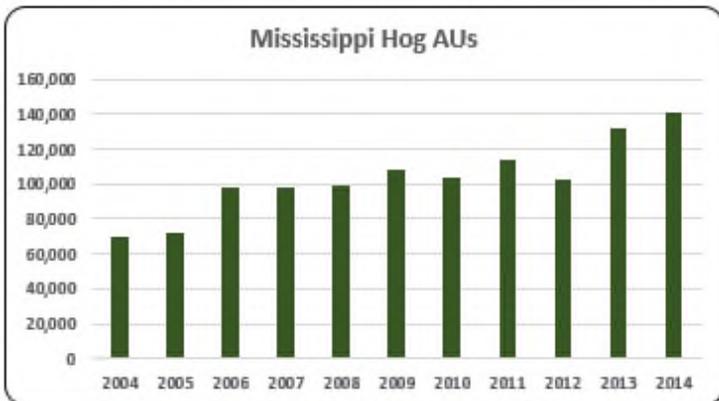
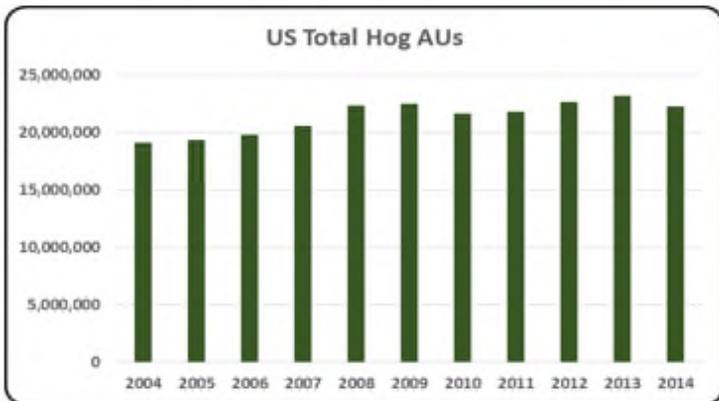
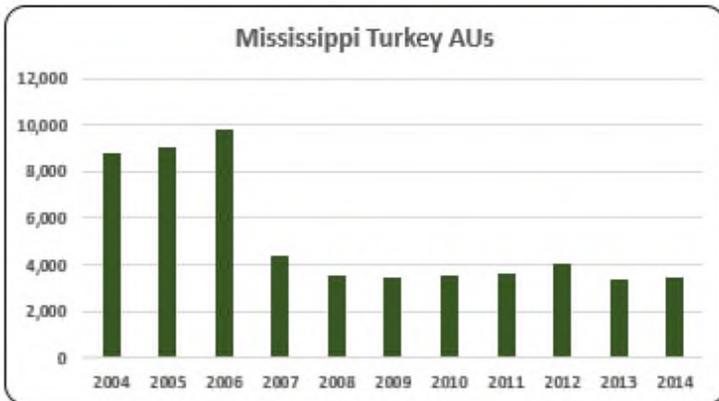
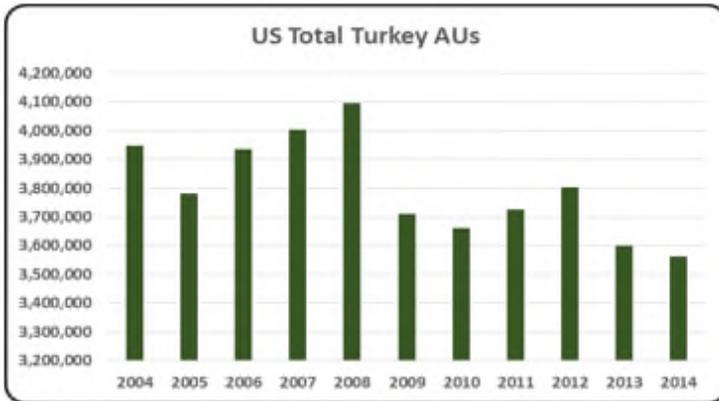
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Mississippi, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (2,185.6 thousand AUs), Beef Cows (333.8 thousand AUs), and Hogs (140.7 thousand AUs). Total animal units in Mississippi during 2014 were 2,704.2 thousand AUs.



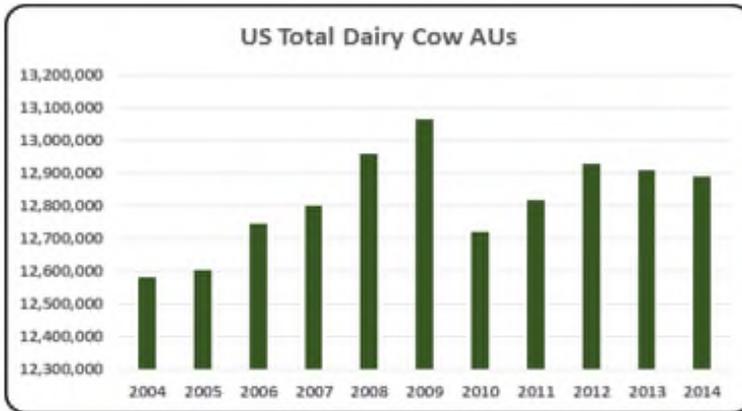
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- There were 2,704.2 thousand AUs in Mississippi in 2014. AUs started to decline from the record high of about 3,100.0 thousand to lowest level of 2,701.8 thousand in 2013. AUs slightly increased in 2014 year-over-year.



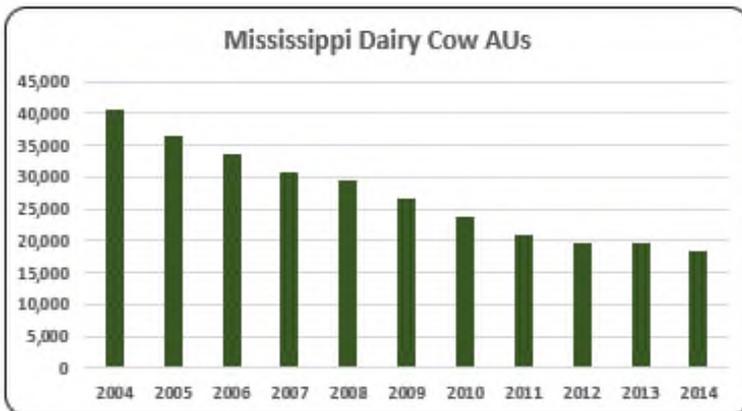
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Almost 81.0% (80.8%) of all animal production in 2014 came from the broiler production. There were 2,185.6 thousand broiler AUs in Mississippi last year. There has been a 9.8% reduction in broiler production since 2004.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layer production in 2014 represented less than 1% (22,387) of all animal production in the state of Mississippi. Numbers have declined 20% from 2004 to 2014.



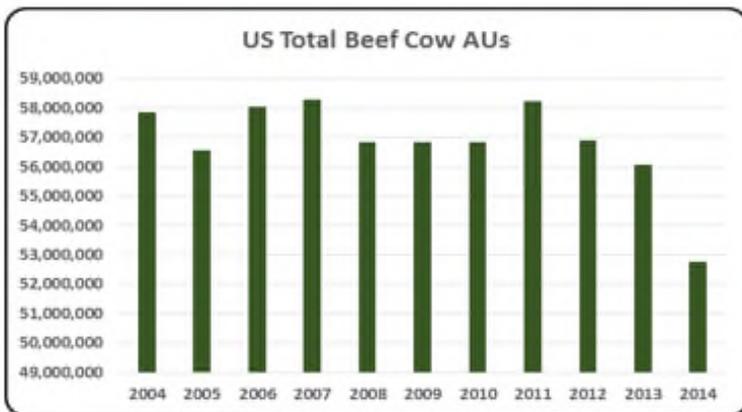
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- The smallest animal production in Mississippi is turkey production. In 2014 only 0.13% (3,494) of all AUs in the state came from turkey production. Turkey production has fallen 60.4% since 2004.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- On average, there were 103,357 hog AUs during the 2004-2014 period. Hog numbers have dramatically increased from 70,050 hog AUs in 2004 to 140,700 hog AUs in 2014.



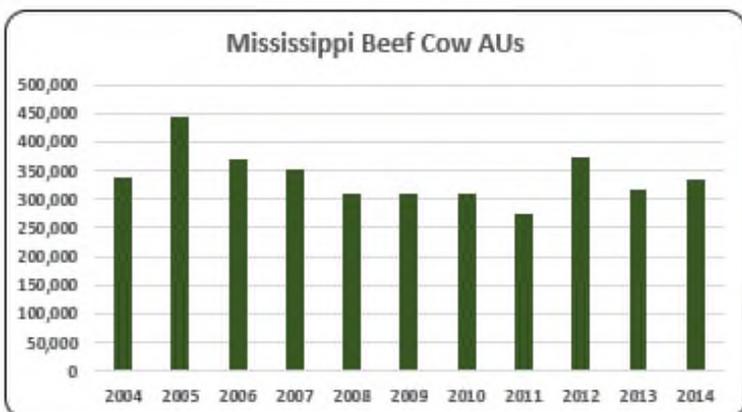
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production plummeted 55% from 2004 to 2014. Dairy cow AUs decreased 7.1% to 18,200 relative to the previous year.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- About 12.3% (333,750 beef cow AUs) of animal production in 2014 was from beef cow production. Beef production has fluctuated between the record high production in 2005 (443,100 beef AUs) to the lowest production in 2011 (274,650 beef AUs).

Mississippi Additional Information and Methodology

Animal agriculture is an important part of Mississippi's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Mississippi, of interest is the degree to which the industry impacts the Mississippi economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Mississippi animal agriculture are presented in this report.

Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Mississippi's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Mississippi which have occurred. As shown in this state report, Mississippi has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Mississippi. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Mississippi Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Mississippi's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Mississippi, \$1.914 to \$2.865 million in total economic activity, \$0.327 to \$0.479 in household wages and 11 to 14 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.3469 | \$ 0.3829 | 12.2 |
| | Hogs, Pigs, and Other | \$ 1.9144 | \$ 0.3273 | 10.6 |
| | Poultry and Eggs | \$ 2.8654 | \$ 0.4790 | 14.0 |
| | Dairy | \$ 2.1056 | \$ 0.3707 | 12.4 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 339,000 | 443,100 | 368,550 | 352,650 | 308,550 | 308,550 | 308,550 | 274,650 | 372,750 | 317,700 | 333,750 |
| | Hog and Pig AUs | 70,050 | 72,150 | 97,650 | 97,500 | 99,450 | 108,450 | 103,725 | 113,325 | 102,075 | 131,850 | 140,700 |
| | Broiler AUs | 2,423,511 | 2,512,481 | 2,367,782 | 2,423,435 | 2,478,880 | 2,334,508 | 2,377,200 | 2,355,549 | 2,258,248 | 2,206,446 | 2,185,624 |
| | Turkey AUs | 8,826 | 9,052 | 9,836 | 4,387 | 3,506 | 3,435 | 3,578 | 3,641 | 4,011 | 3,346 | 3,494 |
| | Egg Layer AUs | 27,836 | 26,816 | 25,604 | 25,640 | 24,180 | 24,460 | 24,008 | 22,216 | 22,117 | 22,823 | 22,387 |
| | Dairy AUs | 40,600 | 36,400 | 33,600 | 30,800 | 29,400 | 26,600 | 23,800 | 21,000 | 19,600 | 19,600 | 18,200 |
| | Total Animal Units | 2,909,823 | 3,099,999 | 2,903,022 | 2,934,412 | 2,943,967 | 2,806,003 | 2,840,861 | 2,790,381 | 2,778,800 | 2,701,765 | 2,704,155 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 223,723 | \$ 230,970 | \$ 185,286 | \$ 189,194 | \$ 156,693 | \$ 145,491 | \$ 148,407 | \$ 186,283 | \$ 216,224 | \$ 218,211 | \$ 273,628 |
| | Hogs and Pigs (\$1,000) | \$ 52,278 | \$ 58,990 | \$ 64,043 | \$ 72,814 | \$ 75,408 | \$ 69,416 | \$ 80,222 | \$ 105,084 | \$ 102,135 | \$ 124,425 | \$ 116,817 |
| | Broilers (\$1,000) | \$ 1,930,412 | \$ 2,053,293 | \$ 1,678,320 | \$ 1,984,192 | \$ 2,243,006 | \$ 2,102,977 | \$ 2,297,212 | \$ 2,123,150 | \$ 2,253,900 | \$ 2,718,146 | \$ 2,871,978 |
| | Turkeys (\$1,000) | \$ 8,189 | \$ 8,684 | \$ 10,263 | \$ 5,059 | \$ 4,736 | \$ 3,176 | \$ 4,255 | \$ 4,772 | \$ 5,817 | \$ 3,831 | \$ 6,414 |
| | Eggs (\$1,000) | \$ 172,166 | \$ 169,834 | \$ 159,891 | \$ 171,379 | \$ 179,075 | \$ 158,710 | \$ 179,794 | \$ 196,486 | \$ 208,357 | \$ 222,415 | \$ 234,653 |
| | Milk (\$1,000) | \$ 63,672 | \$ 60,738 | \$ 49,880 | \$ 66,096 | \$ 60,528 | \$ 35,750 | \$ 41,032 | \$ 45,492 | \$ 40,198 | \$ 40,734 | \$ 50,384 |
| | Other | \$ 255,470 | \$ 249,704 | \$ 243,938 | \$ 238,173 | \$ 232,407 | \$ 226,642 | \$ 220,876 | \$ 215,110 | \$ 209,345 | \$ 203,579 | \$ 197,813 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 255,470 | \$ 249,704 | \$ 243,938 | \$ 238,173 | \$ 232,407 | \$ 226,642 | \$ 220,876 | \$ 215,110 | \$ 209,345 | \$ 203,579 | \$ 197,813 |
| | Total (\$1,000) | \$ 2,705,910 | \$ 2,832,213 | \$ 2,391,621 | \$ 2,726,907 | \$ 2,951,853 | \$ 2,742,162 | \$ 2,971,798 | \$ 2,876,378 | \$ 3,035,975 | \$ 3,531,341 | \$ 3,751,687 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 16,181 | 17,456 | 15,018 | 13,041 | |
| | Cattle feedlots (112112) | 389 | 124 | - | 8 | |
| | Dairy cattle and milk production (11212) | 424 | 388 | 187 | 144 | |
| | Hog and pig farming (1122) | 257 | 252 | 228 | 117 | |
| | Poultry and egg production (1123) | 1,786 | 2,420 | 2,449 | 2,071 | |
| | Sheep and goat farming (1124) | 216 | 421 | 704 | 796 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,796 | 5,316 | 5,114 | 4,118 | |
| Value of Sales (\$1,000) | Cattle and Calves | 227,320 | 228,346 | 323,621 | 332,491 | |
| | Hogs and Pigs | 20,860 | 83,498 | 129,424 | 141,139 | |
| | Poultry and Eggs | 1,472,442 | 1,490,748 | 2,438,690 | 2,744,048 | |
| | Milk and Other Dairy Products | 83,683 | 67,954 | 62,875 | 42,690 | |
| | Aquaculture | 290,382 | 207,181 | 237,883 | 185,241 | |
| | Other (calculated) | 45,733 | 13,182 | 16,260 | 11,829 | |
| | Total | 2,140,420 | 2,090,909 | 3,208,753 | 3,457,438 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 8,789 | 9,917 | 7,762 | 8,434 | |
| | | \$1,000 | 229,688 | 380,748 | 469,684 | 576,540 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 5,128 | 4,012 | 4,798 | |
| | | \$1,000 | <i>n/a</i> | 18,496 | 31,192 | 53,038 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 5,894 | 4,616 | 4,690 | |
| | | \$1,000 | <i>n/a</i> | 362,251 | 438,492 | 523,503 |
| | Feed purchased | (Farms) 18,062 | 26,071 | 21,203 | 22,292 | |
| | | \$1,000 | 845,628 | 804,106 | 1,468,308 | 1,715,141 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 642,178 | \$ 104,772 | 3,329 | \$ 26,539 |
| | Hogs, Pigs, and Other | \$ 602,328 | \$ 102,979 | 3,325 | \$ 26,084 |
| | Poultry and Eggs | \$ 8,920,118 | \$ 1,491,148 | 43,696 | \$ 377,708 |
| | Dairy | \$ 106,089 | \$ 18,677 | 627 | \$ 4,731 |
| | Total | \$ 10,270,713 | \$ 1,717,576 | 50,978 | \$ 435,062 |
| Change from 2004 to 2014 | Cattle and Calves | \$ (15,840) | \$ (2,584) | (82) | \$ (655) |
| | Hogs, Pigs, and Other | \$ (136,017) | \$ (23,255) | (751) | \$ (5,890) |
| | Poultry and Eggs | \$ 1,340,315 | \$ 224,056 | 6,566 | \$ 56,753 |
| | Dairy | \$ (61,930) | \$ (10,903) | (366) | \$ (2,762) |
| | Total | \$ 1,126,527 | \$ 187,314 | 5,367 | \$ 47,447 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.3469 | \$ 0.3829 | 12.2 | |
| | Hogs, Pigs, and Other | \$ 1.9144 | \$ 0.3273 | 10.6 | |
| | Poultry and Eggs | \$ 2.8654 | \$ 0.4790 | 14.0 | |
| | Dairy | \$ 2.1056 | \$ 0.3707 | 12.4 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 5.0% | |
| | Total | | | 25.3% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: MISSOURI

Missouri Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Missouri's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Missouri. The success of Missouri animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Missouri during 2014 animal agriculture contributed:

- \$14.7 billion in economic output
- 93,989 jobs
- \$2.5 billion in earnings
- \$654.1 million in income taxes paid at local, state, and federal levels
- \$193.4 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Missouri increased economic output by over \$5.3 billion, boosted household earnings by \$887.8 million, contributed 32,038 additional jobs and paid \$233.8 million in additional tax revenues.

Missouri's animal agriculture consumed about 1.1 million tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (363.9 thousand tons)
- Broilers (335.4 thousand tons)
- Turkeys (144.1 thousand tons)

This report examines animal agriculture in Missouri over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Missouri, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Missouri and beyond.

Missouri Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Missouri's economy. In 2014, Missouri's animal agriculture contributed the following to the economy:

- About \$14.7 billion in economic output
- \$2.5 billion in household earnings
- 93,989 jobs
- \$654.1 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Missouri's animal agriculture has:

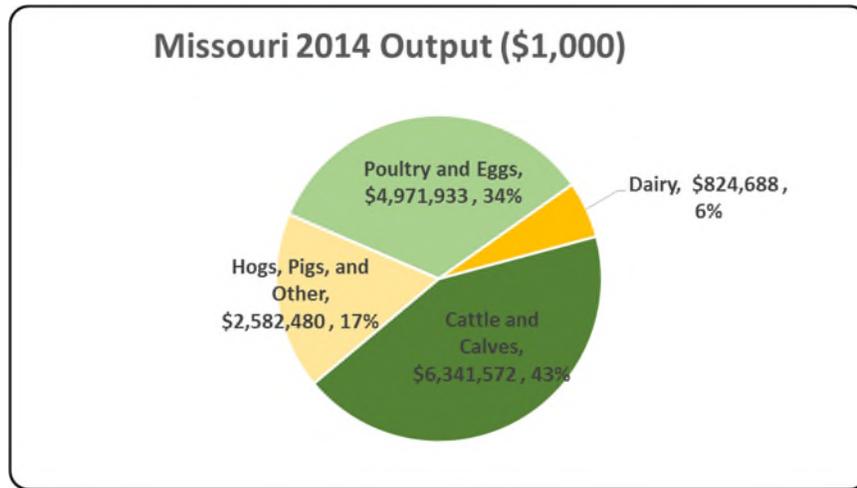
- Increased economic output by \$5.3 billion
- Boosted household earnings by \$887.8 million
- Added 32,038 jobs
- Paid an additional \$233.8 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 14,720,673 | \$ 5,258,144 | 55.57% |
| Earnings (\$1,000) | \$ 2,484,170 | \$ 887,829 | 55.62% |
| Employment (Jobs) | 93,989 | 32,038 | 51.71% |
| Income Taxes Paid (\$1,000) | \$ 654,082 | \$ 233,765 | 55.62% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 193,377 | | |

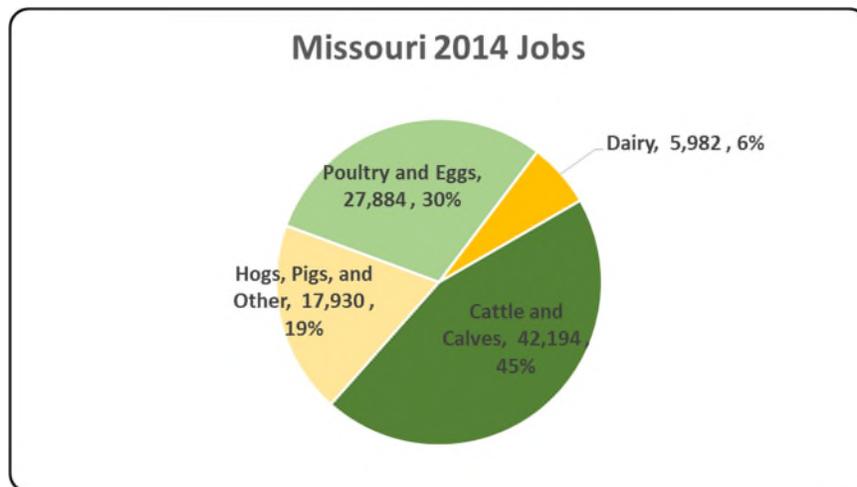
Missouri Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Missouri economy. Animal agriculture’s impact on Missouri total economic output is about \$14.7 billion.



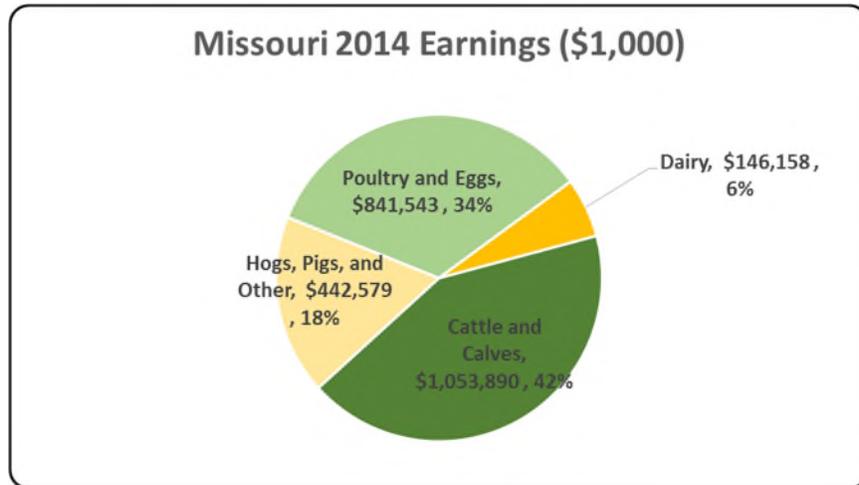
Missouri Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Missouri in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Missouri total jobs, contributing 93,989 jobs within and outside of animal agriculture.



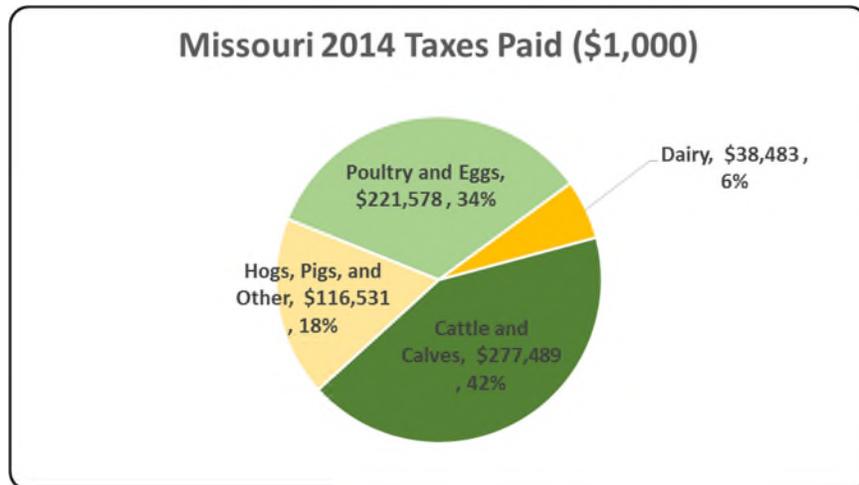
Missouri Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Missouri economy in terms of earnings. Missouri’s animal agriculture contributed about \$2.5 billion to household earnings in 2014.



Missouri Taxes Paid by Animal Agriculture

Missouri’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$654.1 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$193.4 million in property taxes paid by all of Missouri agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



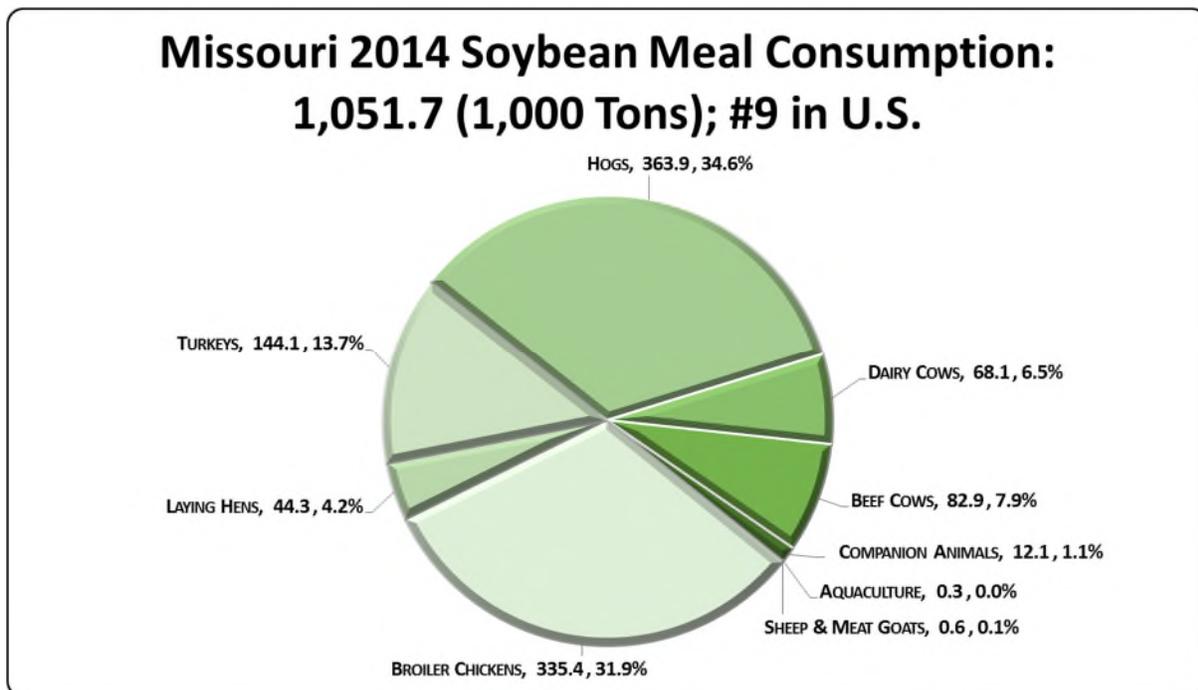
Missouri Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Missouri's animal agriculture consumed almost 1.1 million tons of soybean meal in 2014, placing the state as #9 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (363.9 thousand tons)
- Broilers (335.4 thousand tons)
- Turkeys (144.1 thousand tons)

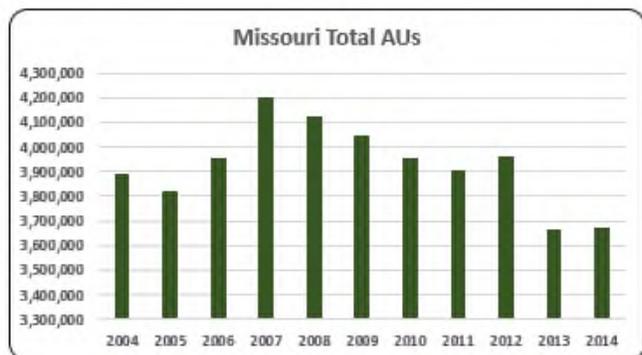
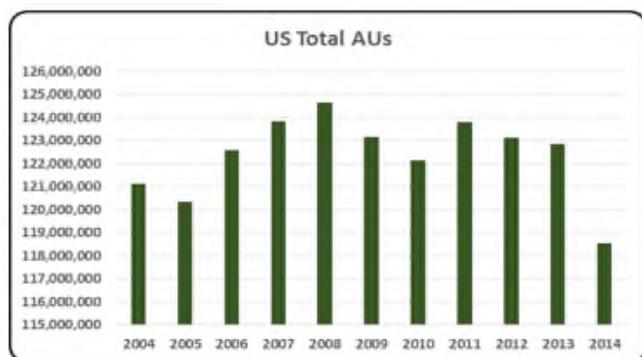


Missouri Animal Unit (AU) Trends

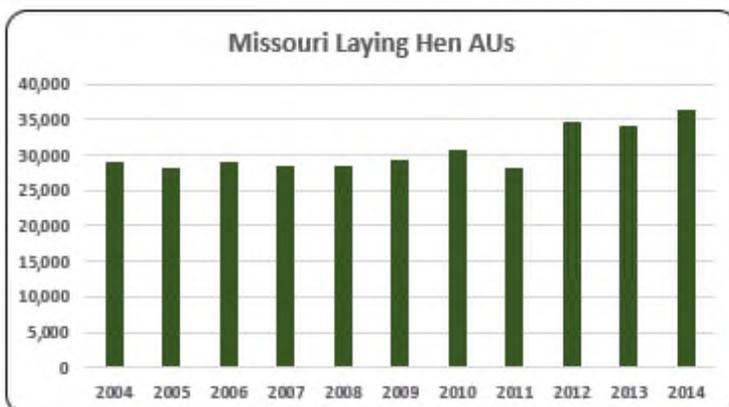
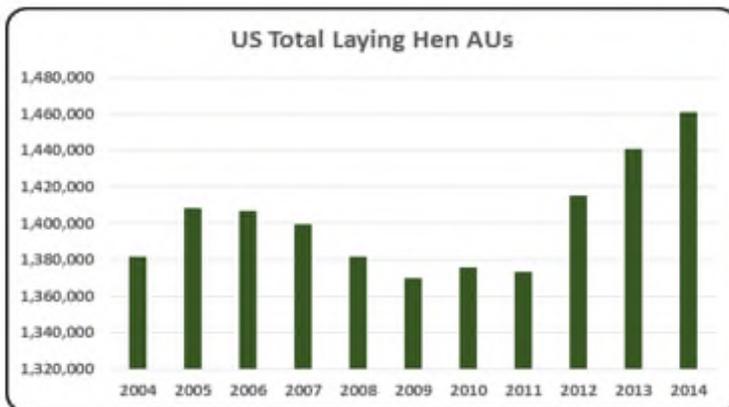
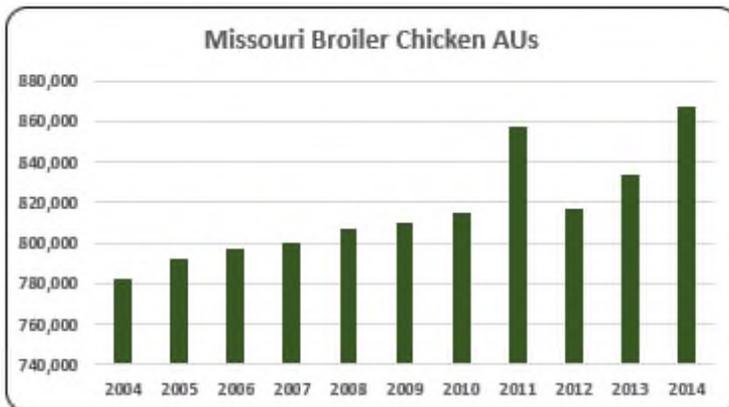
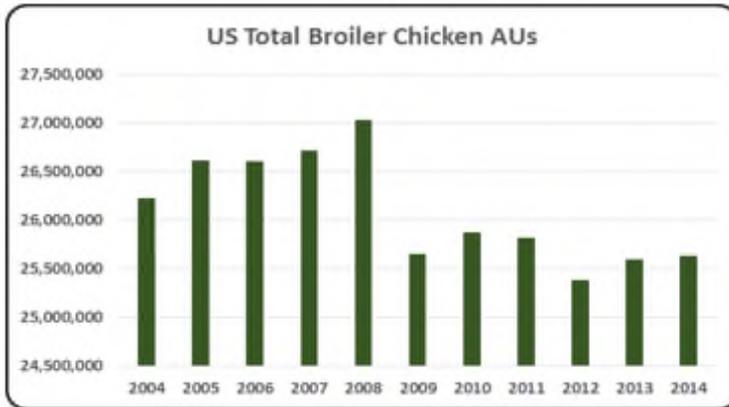
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Missouri. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Missouri and to give perspective on Missouri's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

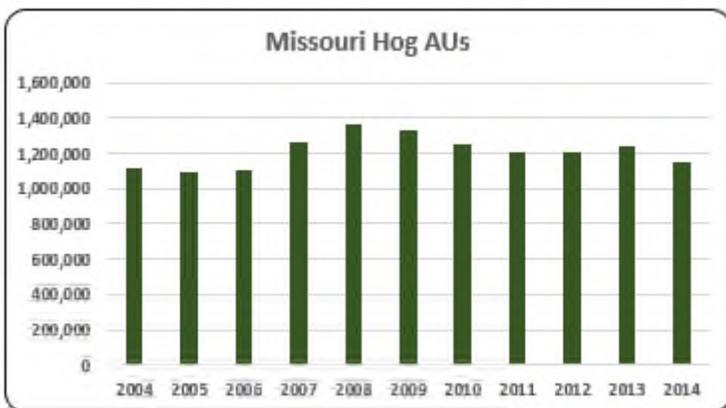
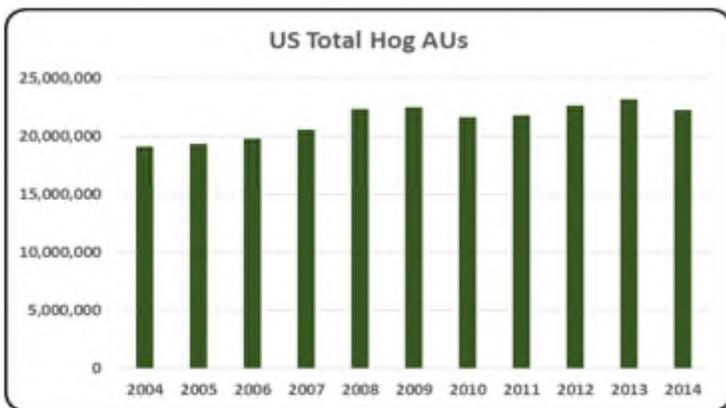
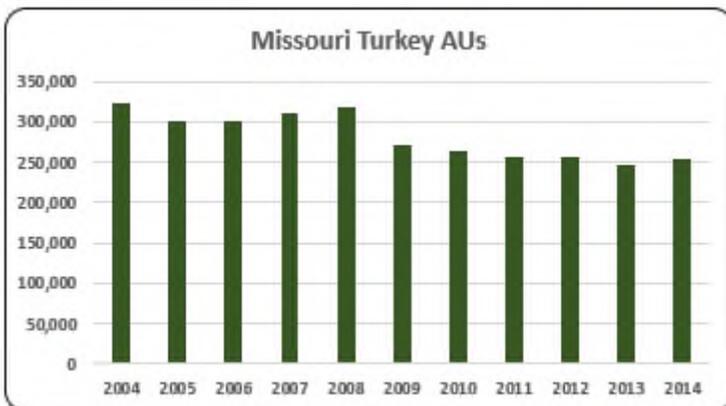
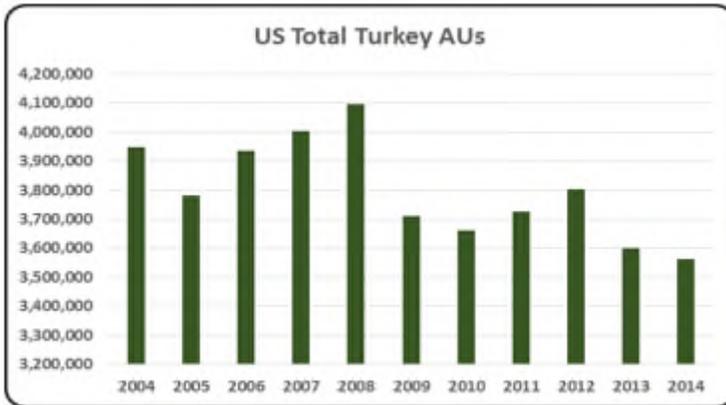
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Missouri, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (1,241.9 thousand AUs), Hogs (1,146.8 thousand AUs), and Broilers (867.1 thousand AUs). Total animal units in Missouri during 2014 were 3,672.9 thousand AUs.



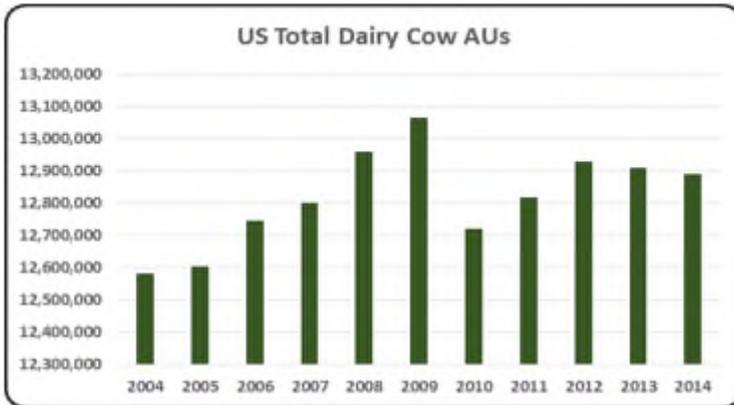
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.
- The total AUs in Missouri in 2014 was 3,672.9 thousand. Thirty three percent of those AUs were from beef cow production whereas 31.2% were from hog production. AUs have dropped 6.0% during the 2004 to 2014 period.



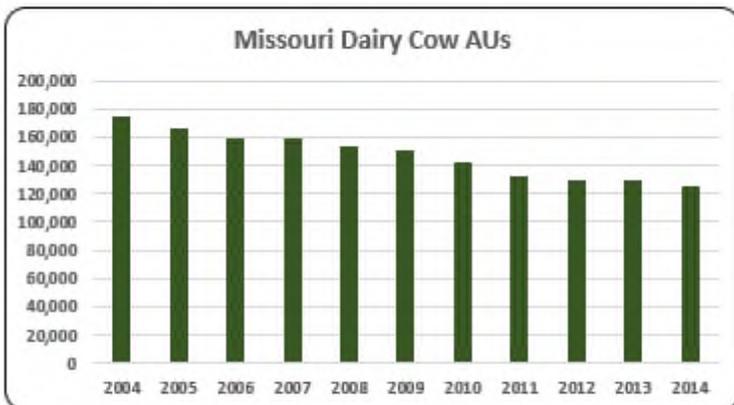
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production in Missouri comprises the third largest animal production in the state. In 2014 there were 867,097 broiler AUs and production has risen 11.0% since the beginning of the decade. Almost 3.4% of all broiler production in the U.S. was in Missouri in 2014.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layer production represented less than 1% of animal production in Missouri in 2014. Layer production has grown 24% from 2004 to 2014.



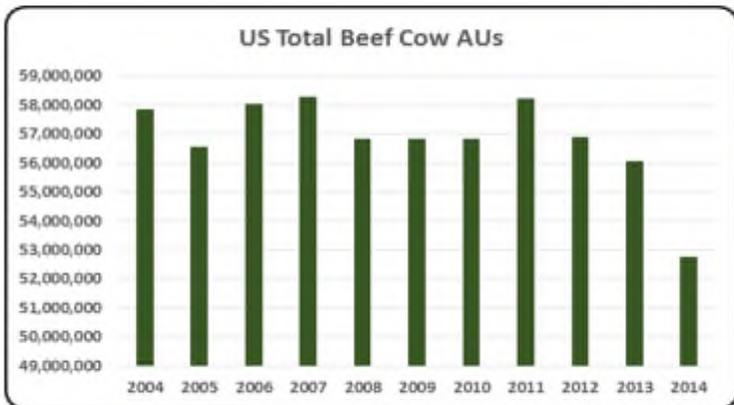
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production has decreased 21% throughout the decade. However, turkey AUs in 2014 climbed 3.5% to 254,918 relative to 2013. About 7.2% of all turkey AUs in the country were in Missouri in 2014.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production shrunk 7.4% to 1,146.8 thousand hog AUs in 2014 and remained 16% below the record high level achieved in 2008 (1,360.8 thousand hog AUs).



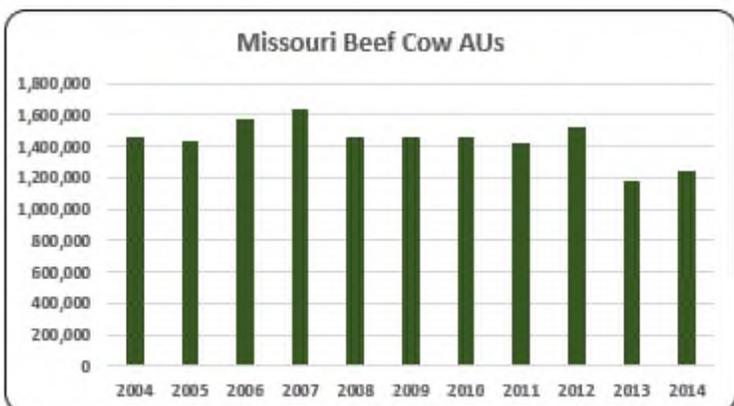
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- The average number of dairy cow AUs during 2004-2014 was 148,018. In general, dairy production has trended downward during the decade.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- There were 1,241.9 thousand beef cow AUs in 2014. Beef cow AUs increased 5.0% in 2014 year-over-year.

Missouri Additional Information and Methodology

Animal agriculture is an important part of Missouri's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Missouri, of interest is the degree to which the industry impacts the Missouri economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Missouri animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Missouri's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Missouri which have occurred. As shown in this state report, Missouri has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Missouri. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Missouri Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Missouri's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Missouri, \$2.123 to \$3.241 million in total economic activity, \$0.364 to \$0.549 in household wages and 15 to 20 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.9918 | \$ 0.4972 | 19.9 |
| | Hogs, Pigs, and Other | \$ 2.1228 | \$ 0.3638 | 14.7 |
| | Poultry and Eggs | \$ 3.2406 | \$ 0.5485 | 18.2 |
| | Dairy | \$ 2.4240 | \$ 0.4296 | 17.6 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,463,700 | 1,436,700 | 1,567,200 | 1,637,700 | 1,456,950 | 1,456,950 | 1,456,950 | 1,425,450 | 1,522,500 | 1,183,050 | 1,241,850 |
| | Hog and Pig AUs | 1,119,150 | 1,097,250 | 1,101,300 | 1,264,950 | 1,360,800 | 1,329,600 | 1,249,290 | 1,208,100 | 1,201,575 | 1,238,025 | 1,146,825 |
| | Broiler AUs | 782,649 | 792,314 | 796,733 | 800,087 | 806,764 | 809,692 | 814,422 | 856,891 | 816,372 | 833,767 | 867,097 |
| | Turkey AUs | 322,500 | 301,584 | 301,653 | 309,534 | 317,039 | 271,084 | 263,316 | 255,619 | 255,635 | 246,209 | 254,918 |
| | Egg Layer AUs | 29,140 | 28,096 | 29,084 | 28,512 | 28,472 | 29,176 | 30,840 | 28,112 | 34,791 | 34,025 | 36,230 |
| | Dairy AUs | 175,000 | 166,600 | 159,600 | 159,600 | 154,000 | 151,200 | 142,800 | 133,000 | 130,200 | 130,200 | 126,000 |
| | Total Animal Units | 3,892,139 | 3,822,544 | 3,955,570 | 4,200,383 | 4,124,025 | 4,047,702 | 3,957,618 | 3,907,172 | 3,961,073 | 3,665,276 | 3,672,920 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 1,370,355 | \$ 1,499,574 | \$ 1,407,082 | \$ 1,320,059 | \$ 1,275,340 | \$ 1,166,923 | \$ 1,249,386 | \$ 1,573,612 | \$ 1,592,860 | \$ 1,569,300 | \$ 2,119,651 |
| | Hogs and Pigs (\$1,000) | \$ 551,601 | \$ 539,175 | \$ 589,434 | \$ 716,030 | \$ 759,846 | \$ 674,301 | \$ 698,685 | \$ 934,293 | \$ 905,013 | \$ 960,080 | \$ 1,200,854 |
| | Broilers (\$1,000) | \$ 88,190 | \$ 168,364 | \$ 231,656 | \$ 303,386 | \$ 381,101 | \$ 448,472 | \$ 520,742 | \$ 628,371 | \$ 651,850 | \$ 808,221 | \$ 882,118 |
| | Turkeys (\$1,000) | \$ 279,930 | \$ 282,600 | \$ 317,000 | \$ 361,620 | \$ 371,070 | \$ 305,250 | \$ 361,584 | \$ 385,501 | \$ 420,163 | \$ 361,760 | \$ 399,840 |
| | Eggs (\$1,000) | \$ 101,395 | \$ 74,570 | \$ 74,213 | \$ 128,026 | \$ 173,788 | \$ 133,665 | \$ 160,143 | \$ 173,429 | \$ 173,312 | \$ 225,228 | \$ 252,305 |
| | Milk (\$1,000) | \$ 302,908 | \$ 290,625 | \$ 244,720 | \$ 325,532 | \$ 305,235 | \$ 203,840 | \$ 239,870 | \$ 287,316 | \$ 264,704 | \$ 276,545 | \$ 340,218 |
| | Other | \$ 11,286 | \$ 12,314 | \$ 12,139 | \$ 12,519 | \$ 12,438 | \$ 13,069 | \$ 14,745 | \$ 14,385 | \$ 14,820 | \$ 15,255 | \$ 15,690 |
| | Sheep and Lambs (\$1,000) | \$ 4,179 | \$ 5,170 | \$ 4,958 | \$ 5,302 | \$ 5,184 | \$ 5,778 | \$ 7,418 | \$ 7,021 | \$ 7,420 | \$ 7,818 | \$ 8,217 |
| | Aquaculture (\$1,000) | \$ 7,107 | \$ 7,144 | \$ 7,181 | \$ 7,217 | \$ 7,254 | \$ 7,291 | \$ 7,327 | \$ 7,364 | \$ 7,400 | \$ 7,437 | \$ 7,474 |
| | Total (\$1,000) | \$ 2,705,666 | \$ 2,867,222 | \$ 2,876,244 | \$ 3,167,173 | \$ 3,278,818 | \$ 2,945,519 | \$ 3,245,155 | \$ 3,996,907 | \$ 4,022,722 | \$ 4,216,389 | \$ 5,210,676 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 49,947 | 48,441 | 44,336 | 40,724 | |
| | Cattle feedlots (112112) | 2,024 | 3,029 | 1,300 | 730 | |
| | Dairy cattle and milk production (11212) | 2,599 | 2,664 | 1,705 | 1,153 | |
| | Hog and pig farming (1122) | 2,444 | 1,469 | 1,056 | 689 | |
| | Poultry and egg production (1123) | 1,162 | 1,362 | 2,245 | 1,645 | |
| | Sheep and goat farming (1124) | 646 | 922 | 1,595 | 2,086 | |
| | Animal aquaculture and other animal production (1125,1129) | 3,859 | 8,047 | 9,216 | 7,265 | |
| Value of Sales (\$1,000) | Cattle and Calves | 1,143,320 | 1,285,288 | 1,676,632 | 1,968,617 | |
| | Hogs and Pigs | 841,644 | 570,551 | 725,738 | 882,526 | |
| | Poultry and Eggs | 755,708 | 784,986 | 1,265,166 | 1,441,676 | |
| | Milk and Other Dairy Products | 293,411 | 300,460 | 302,684 | 246,358 | |
| | Aquaculture | 5,374 | 11,107 | 9,506 | 10,256 | |
| | Other (calculated) | 36,613 | 38,417 | 38,262 | 25,866 | |
| | Total | 3,076,070 | 2,990,809 | 4,017,988 | 4,575,299 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 29,162 | 30,120 | 25,620 | 27,112 | |
| | | \$1,000 | 574,610 | 546,196 | 761,333 | 906,474 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 19,512 | 17,469 | 18,367 | |
| | | \$1,000 | <i>n/a</i> | 97,217 | 142,362 | 209,880 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 14,508 | 11,591 | 12,517 | |
| | | \$1,000 | <i>n/a</i> | 448,979 | 618,971 | 696,594 |
| Feed purchased | (Farms) 61,570 | 69,368 | 59,938 | 63,616 | | |
| | \$1,000 | 1,056,896 | 1,136,939 | 1,383,506 | 1,989,225 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 6,341,572 | \$ 1,053,890 | 42,194 | \$ 277,489 |
| | Hogs, Pigs, and Other | \$ 2,582,480 | \$ 442,579 | 17,930 | \$ 116,531 |
| | Poultry and Eggs | \$ 4,971,933 | \$ 841,543 | 27,884 | \$ 221,578 |
| | Dairy | \$ 824,688 | \$ 146,158 | 5,982 | \$ 38,483 |
| | Total | \$ 14,720,673 | \$ 2,484,170 | 93,989 | \$ 654,082 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 1,203,526 | \$ 200,011 | 8,008 | \$ 52,663 |
| | Hogs, Pigs, and Other | \$ 1,084,994 | \$ 185,943 | 7,533 | \$ 48,959 |
| | Poultry and Eggs | \$ 3,065,123 | \$ 518,799 | 17,190 | \$ 136,600 |
| | Dairy | \$ (95,498) | \$ (16,925) | (693) | \$ (4,456) |
| | Total | \$ 5,258,144 | \$ 887,829 | 32,038 | \$ 233,765 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 2.9918 | \$ 0.4972 | 19.9 | |
| | Hogs, Pigs, and Other | \$ 2.1228 | \$ 0.3638 | 14.7 | |
| | Poultry and Eggs | \$ 3.2406 | \$ 0.5485 | 18.2 | |
| | Dairy | \$ 2.4240 | \$ 0.4296 | 17.6 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 6.0% |
| | Total | | | | 26.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: MONTANA

Montana Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Montana's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Montana. The success of Montana animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Montana during 2014 animal agriculture contributed:

- \$5.3 billion in economic output
- 36,614 jobs
- \$888.4 million in earnings
- \$241.9 million in income taxes paid at local, state, and federal levels
- \$126.6 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Montana increased economic output by over \$1.5 billion, boosted household earnings by \$258.6 million, contributed 10,695 additional jobs and paid \$70.4 million in additional tax revenues.

Montana's animal agriculture consumed about 57.0 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (24.9 thousand tons)
- Beef Cows (17.5 thousand tons)
- Egg-Laying Hens (3.8 thousand tons)

This report examines animal agriculture in Montana over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Montana, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Montana and beyond.

Montana Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Montana's economy. In 2014, Montana's animal agriculture contributed the following to the economy:

- About \$5.3 billion in economic output
- \$888.4 million in household earnings
- 36,614 jobs
- \$241.9 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Montana's animal agriculture has:

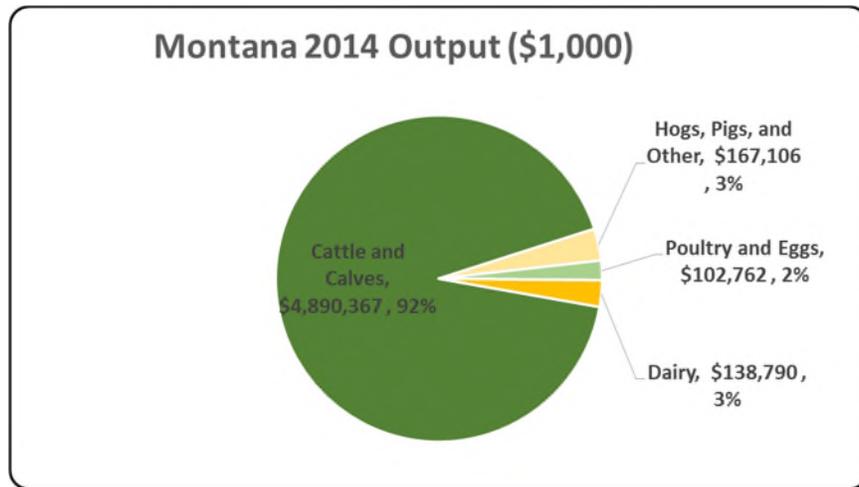
- Increased economic output by \$1.5 billion
- Boosted household earnings by \$258.6 million
- Added 10,695 jobs
- Paid an additional \$70.4 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 5,299,026 | \$ 1,546,530 | 41.21% |
| Earnings (\$1,000) | \$ 888,420 | \$ 258,623 | 41.06% |
| Employment (Jobs) | 36,614 | 10,695 | 41.26% |
| Income Taxes Paid (\$1,000) | \$ 241,917 | \$ 70,423 | 41.06% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 126,644 | | |

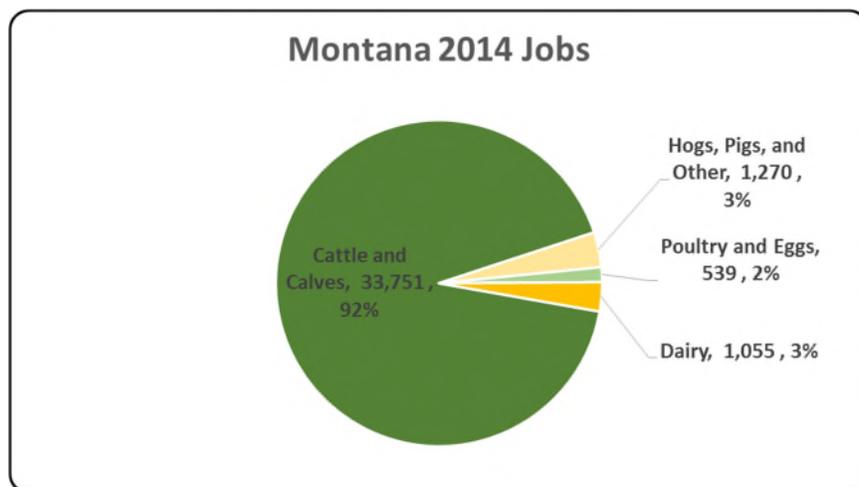
Montana Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Montana economy. Animal agriculture’s impact on Montana total economic output is about \$5.3 billion.



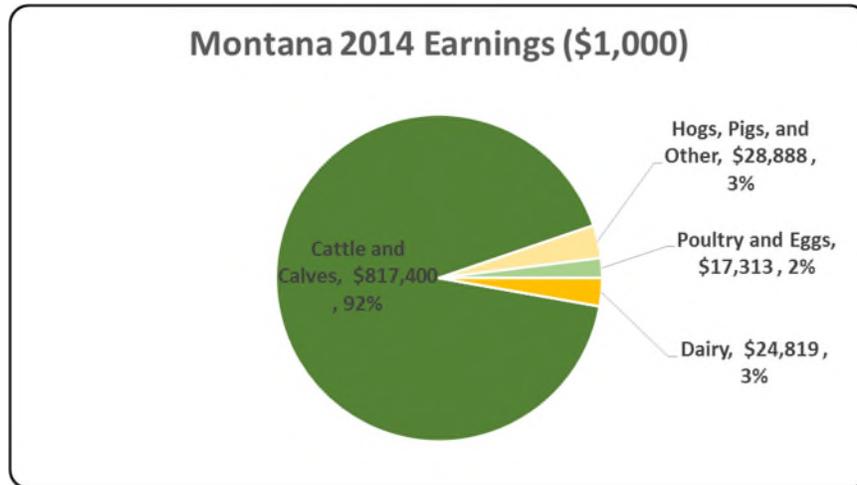
Montana Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Montana in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Montana total jobs, contributing 36,614 jobs within and outside of animal agriculture.



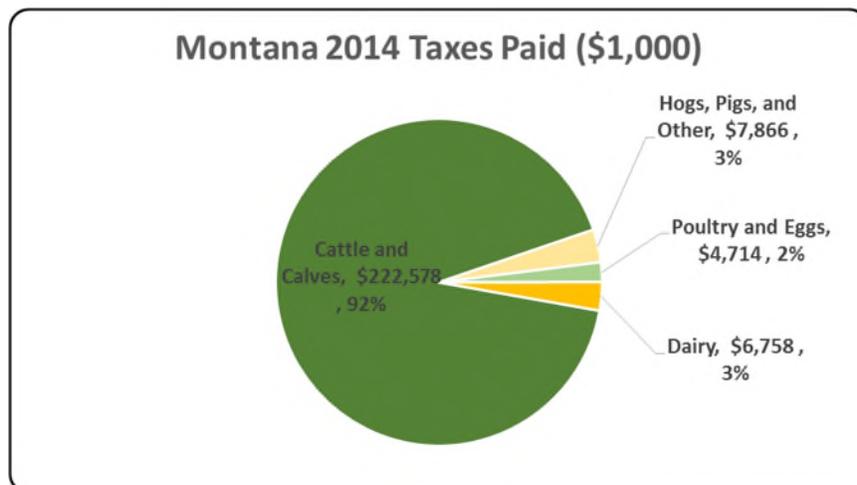
Montana Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Montana economy in terms of earnings. Montana’s animal agriculture contributed about \$888.4 million to household earnings in 2014.



Montana Taxes Paid by Animal Agriculture

Montana’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$241.9 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$126.6 million in property taxes paid by all of Montana agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



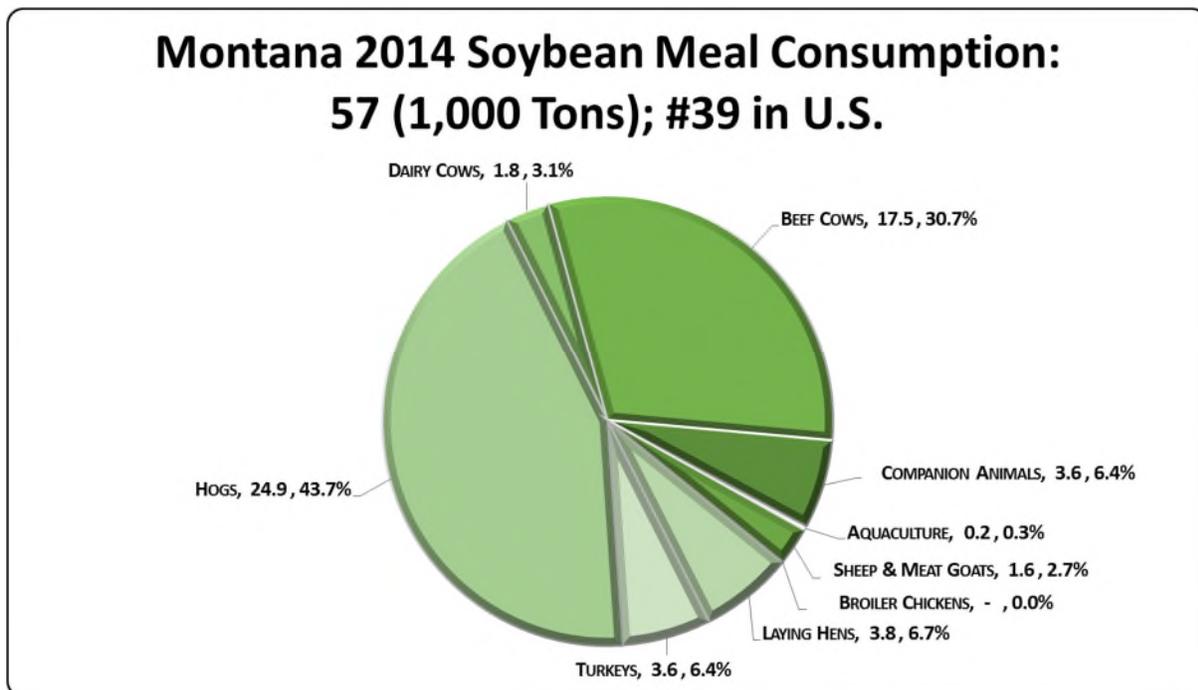
Montana Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Montana’s animal agriculture consumed almost 57.0 thousand tons of soybean meal in 2014, placing the state as #39 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (24.9 thousand tons)
- Beef Cows (17.5 thousand tons)
- Egg-Laying Hens (3.8 thousand tons)

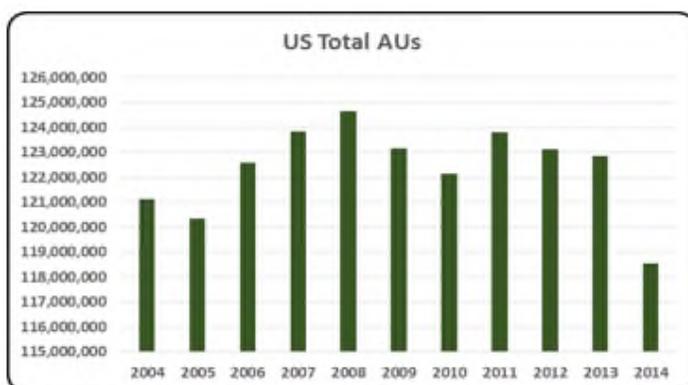


Montana Animal Unit (AU) Trends

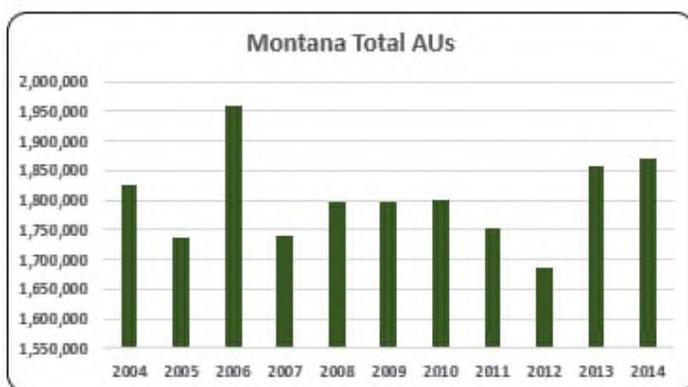
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Montana. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Montana and to give perspective on Montana's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

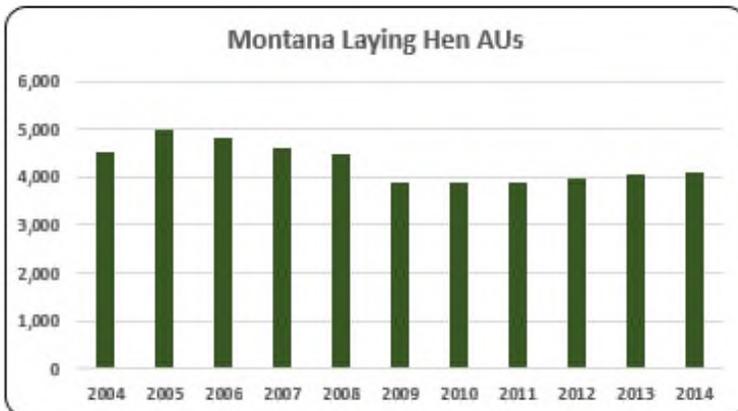
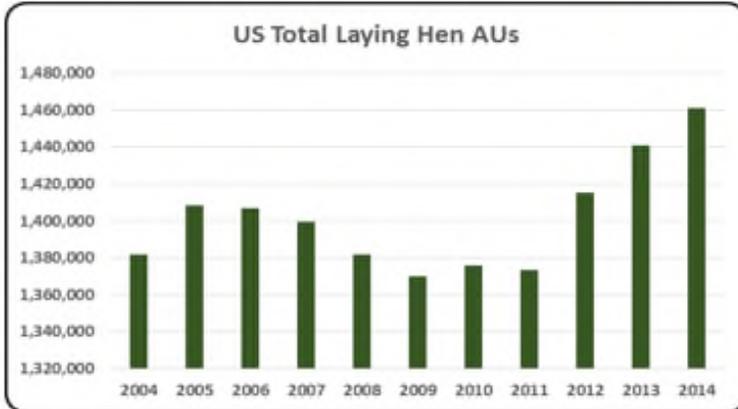
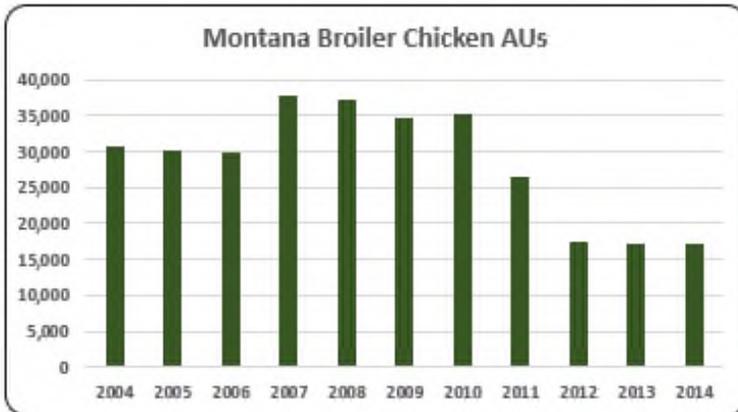
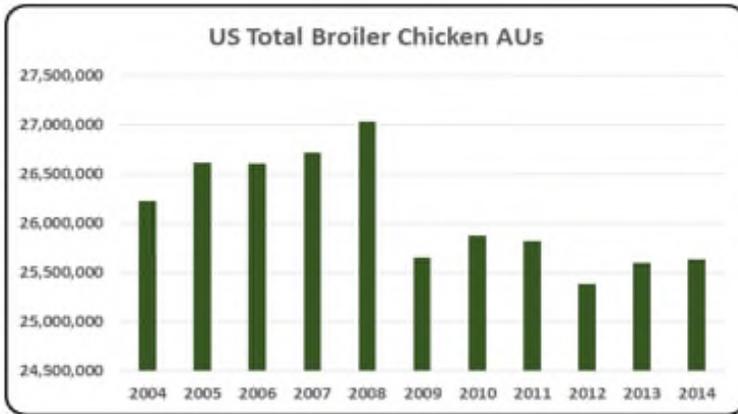
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Montana, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (1,750.2 thousand AUs), Hogs (73.7 thousand AUs), and Dairy Cows (19.6 thousand AUs). Total animal units in Montana during 2014 were 1,871.2 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- Total AU numbers in Montana shifted irregularly during the decade. AUs were a record 1,960.6 thousand in 2006.

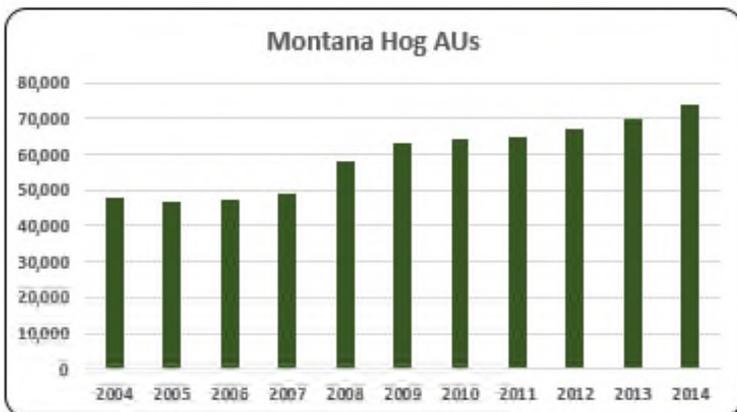
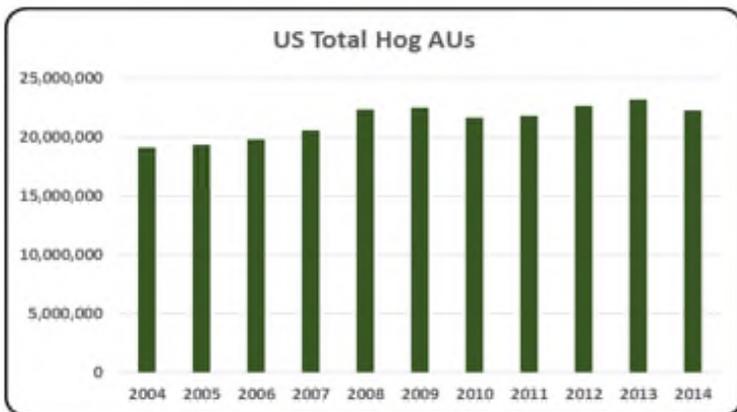
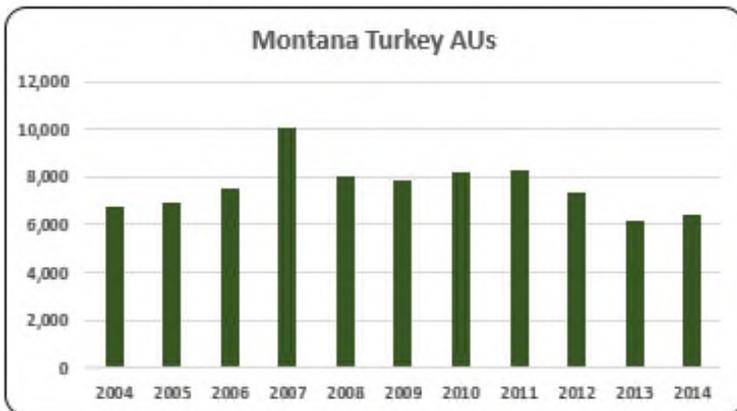
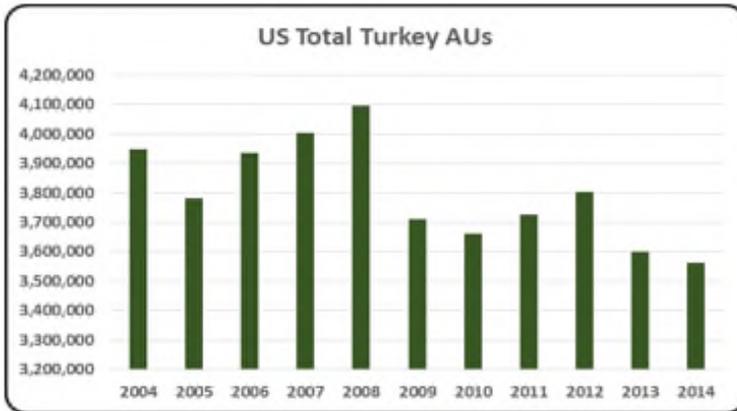


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

- There has been a sharp decline in broiler production in Montana from 37,894 broiler AUs in 2007 to 17,172 broiler AUs in 2014.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

- Only 0.22% (4,101) of all animal production in Montana came from layer production in 2014. On average from 2004 to 2014, there has been 4,289 layer AUs in the state.

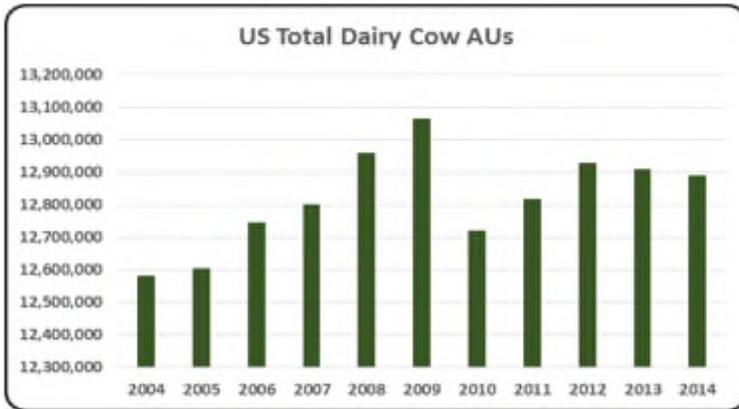


- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

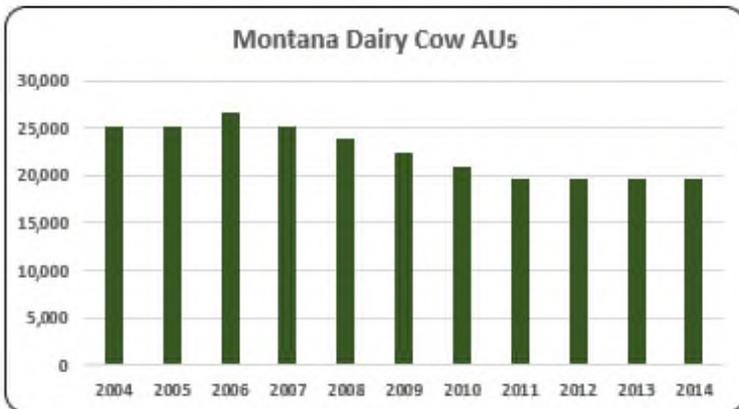
- 2007 was record year in turkey production in Montana with 10,027 turkey AUs. In 2014 there were only 6,422 AUs in the state.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

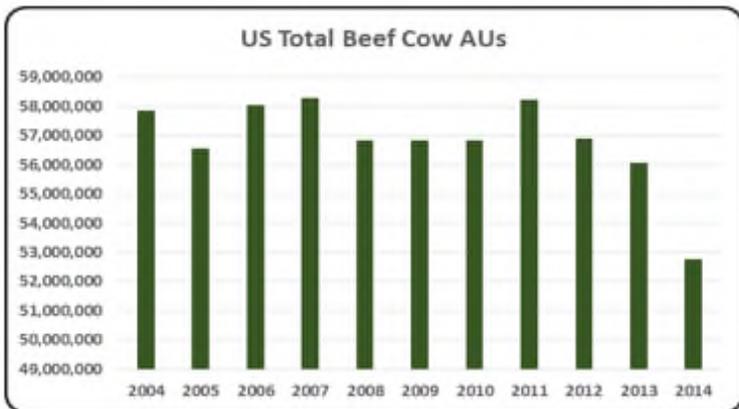
- Hog production represented about 4% of animal production in 2014. Hog AUs increased 5.8% to 73,695 hog AUs in 2014 relative to 2013



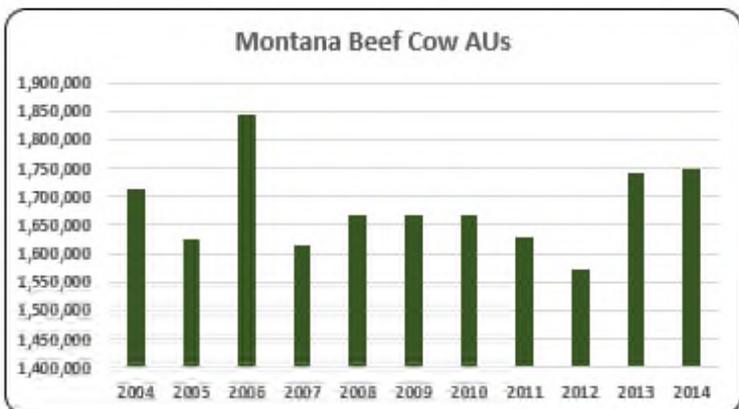
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- From 2011 to 2014 dairy cow AUs averaged 19,600 staying 26% below the record high in 2006 (26,600 dairy cow AUs).



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- About 93.5% (1,750.2 thousand) of all AUs in 2014 were beef cow AUs, making it the number one animal production in the state.

Montana Additional Information and Methodology

Animal agriculture is an important part of Montana's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Montana, of interest is the degree to which the industry impacts the Montana economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Montana animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Montana's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Montana which have occurred. As shown in this state report, Montana has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Montana. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Montana Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Montana's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Montana, \$1.899 to \$2.753 million in total economic activity, \$0.328 to \$0.460 in household wages and 12 to 19 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.7533 | \$ 0.4602 | 19.0 |
| | Hogs, Pigs, and Other | \$ 1.8991 | \$ 0.3283 | 14.4 |
| | Poultry and Eggs | \$ 2.1950 | \$ 0.3698 | 11.5 |
| | Dairy | \$ 2.0959 | \$ 0.3748 | 15.9 |

Appendix

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|-----------------------------|---------------------|---------------------|-------------------|---------------------|---------------------|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,712,250 | 1,623,750 | 1,844,250 | 1,613,250 | 1,666,500 | 1,666,500 | 1,666,500 | 1,628,550 | 1,571,700 | 1,740,000 | 1,750,200 |
| | Hog and Pig AUs | 47,625 | 46,815 | 47,445 | 49,170 | 58,170 | 63,150 | 64,350 | 64,815 | 67,170 | 69,630 | 73,695 |
| | Broiler AUs | 30,772 | 30,124 | 29,920 | 37,894 | 37,303 | 34,683 | 35,149 | 26,485 | 17,330 | 17,270 | 17,172 |
| | Turkey AUs | 6,771 | 6,944 | 7,545 | 10,027 | 8,014 | 7,850 | 8,177 | 8,323 | 7,371 | 6,149 | 6,422 |
| | Egg Layer AUs | 4,530 | 4,989 | 4,814 | 4,594 | 4,463 | 3,904 | 3,878 | 3,900 | 3,975 | 4,036 | 4,101 |
| | Dairy AUs | 25,200 | 25,200 | 26,600 | 25,200 | 23,800 | 22,400 | 21,000 | 19,600 | 19,600 | 19,600 | 19,600 |
| | Total Animal Units | 1,827,147 | 1,737,822 | 1,960,575 | 1,740,134 | 1,798,250 | 1,798,487 | 1,799,054 | 1,751,674 | 1,687,146 | 1,856,685 | 1,871,189 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 976,312 | \$ 997,754 | \$ 858,727 | \$ 999,384 | \$ 875,617 | \$ 773,385 | \$ 1,041,683 | \$ 1,107,700 | \$ 1,263,600 | \$ 1,358,818 | \$ 1,776,184 |
| | Hogs and Pigs (\$1,000) | \$ 34,089 | \$ 36,959 | \$ 33,778 | \$ 37,104 | \$ 35,785 | \$ 33,794 | \$ 43,709 | \$ 54,381 | \$ 58,332 | \$ 61,604 | \$ 71,353 |
| | Broilers (\$1,000) | \$ 25,882 | \$ 24,516 | \$ 18,946 | \$ 28,507 | \$ 29,338 | \$ 25,413 | \$ 26,748 | \$ 23,567 | \$ 17,264 | \$ 21,032 | \$ 22,063 |
| | Turkeys (\$1,000) | \$ 6,282 | \$ 6,661 | \$ 7,873 | \$ 11,563 | \$ 10,825 | \$ 7,260 | \$ 9,726 | \$ 10,908 | \$ 10,690 | \$ 7,040 | \$ 11,787 |
| | Eggs (\$1,000) | \$ 5,862 | \$ 3,300 | \$ 4,031 | \$ 8,059 | \$ 9,567 | \$ 6,890 | \$ 6,619 | \$ 8,682 | \$ 8,642 | \$ 10,705 | \$ 12,966 |
| | Milk (\$1,000) | \$ 54,288 | \$ 56,916 | \$ 46,374 | \$ 62,271 | \$ 59,470 | \$ 43,654 | \$ 48,841 | \$ 57,312 | \$ 53,820 | \$ 55,726 | \$ 66,220 |
| | Other | \$ 23,265 | \$ 24,076 | \$ 18,395 | \$ 18,714 | \$ 17,026 | \$ 18,453 | \$ 22,522 | \$ 18,230 | \$ 17,700 | \$ 17,169 | \$ 16,639 |
| | Sheep and Lambs (\$1,000) | \$ 22,955 | \$ 23,774 | \$ 18,101 | \$ 18,427 | \$ 16,747 | \$ 18,182 | \$ 22,259 | \$ 17,974 | \$ 17,452 | \$ 16,929 | \$ 16,407 |
| | Aquaculture (\$1,000) | \$ 310 | \$ 302 | \$ 294 | \$ 287 | \$ 279 | \$ 271 | \$ 263 | \$ 256 | \$ 248 | \$ 240 | \$ 232 |
| | Total (\$1,000) | \$ 1,125,979 | \$ 1,150,183 | \$ 988,124 | \$ 1,165,602 | \$ 1,037,628 | \$ 908,849 | \$ 1,199,848 | \$ 1,280,779 | \$ 1,430,048 | \$ 1,532,094 | \$ 1,977,213 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 10,373 | 9,859 | 9,804 | 8,703 | |
| | Cattle feedlots (112112) | 265 | 355 | 244 | 162 | |
| | Dairy cattle and milk production (11212) | 128 | 136 | 138 | 75 | |
| | Hog and pig farming (1122) | 163 | 142 | 118 | 88 | |
| | Poultry and egg production (1123) | 68 | 131 | 398 | 206 | |
| | Sheep and goat farming (1124) | 726 | 687 | 606 | 576 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,982 | 4,500 | 5,294 | 5,261 | |
| Value of Sales (\$1,000) | Cattle and Calves | 831,621 | 1,015,169 | 1,368,699 | 1,783,908 | |
| | Hogs and Pigs | 33,029 | 26,531 | 36,331 | 54,091 | |
| | Poultry and Eggs | 5,665 | 5,243 | 7,975 | withheld | |
| | Milk and Other Dairy Products | 36,528 | 41,842 | 54,761 | 44,671 | |
| | Aquaculture | withheld | 4,185 | 3,188 | 3,172 | |
| | Other (calculated) | 62,460 | 55,821 | 58,386 | 31,233 | |
| | Total | 969,303 | 1,148,791 | 1,529,340 | 1,917,075 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 8,433 | 7,935 | 7,287 | 8,619 | |
| | | \$1,000 | 153,915 | 207,332 | 291,561 | 365,896 |
| | Breeding livestock purchased | (Farms) withheld | 5,514 | 5,523 | 6,466 | |
| | | \$1,000 | withheld | 41,400 | 90,394 | 117,977 |
| | Other livestock and poultry purchased | (Farms) withheld | 3,700 | 2,996 | 3,507 | |
| | | \$1,000 | withheld | 165,932 | 201,167 | 247,919 |
| | Feed purchased | (Farms) 13,389 | 15,381 | 13,716 | 16,861 | |
| | | \$1,000 | 153,271 | 192,619 | 219,242 | 439,672 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 4,890,367 | \$ 817,400 | 33,751 | \$ 222,578 |
| | Hogs, Pigs, and Other | \$ 167,106 | \$ 28,888 | 1,270 | \$ 7,866 |
| | Poultry and Eggs | \$ 102,762 | \$ 17,313 | 539 | \$ 4,714 |
| | Dairy | \$ 138,790 | \$ 24,819 | 1,055 | \$ 6,758 |
| | Total | \$ 5,299,026 | \$ 888,420 | 36,614 | \$ 241,917 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 1,521,573 | \$ 254,323 | 10,501 | \$ 69,252 |
| | Hogs, Pigs, and Other | \$ 30,603 | \$ 5,290 | 233 | \$ 1,441 |
| | Poultry and Eggs | \$ (1,841) | \$ (310) | (10) | \$ (84) |
| | Dairy | \$ (3,805) | \$ (680) | (29) | \$ (185) |
| | Total | \$ 1,546,530 | \$ 258,623 | 10,695 | \$ 70,423 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 2.7533 | \$ 0.4602 | 19.0 | |
| | Hogs, Pigs, and Other | \$ 1.8991 | \$ 0.3283 | 14.4 | |
| | Poultry and Eggs | \$ 2.1950 | \$ 0.3698 | 11.5 | |
| | Dairy | \$ 2.0959 | \$ 0.3748 | 15.9 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 6.9% | |
| | Total | | | 27.2% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: NEBRASKA

Nebraska Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Nebraska's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Nebraska. The success of Nebraska animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Nebraska during 2014 animal agriculture contributed:

- \$22.7 billion in economic output
- 95,032 jobs
- \$3.6 billion in earnings
- \$985.2 million in income taxes paid at local, state, and federal levels
- \$479.0 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Nebraska increased economic output by over \$8.2 billion, boosted household earnings by \$1.3 billion, contributed 34,171 additional jobs and paid \$353.8 million in additional tax revenues.

Nebraska's animal agriculture consumed about 825.4 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (397.9 thousand tons)
- Beef Cows (334.2 thousand tons)
- Egg-Laying Hens (59.7 thousand tons)

This report examines animal agriculture in Nebraska over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Nebraska, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Nebraska and beyond.

Nebraska Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Nebraska's economy. In 2014, Nebraska's animal agriculture contributed the following to the economy:

- About \$22.7 billion in economic output
- \$3.6 billion in household earnings
- 95,032 jobs
- \$985.2 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Nebraska's animal agriculture has:

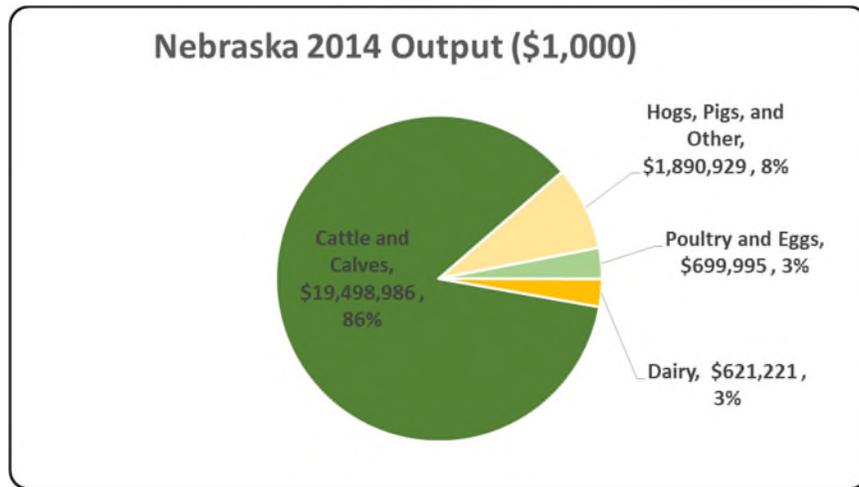
- Increased economic output by \$8.2 billion
- Boosted household earnings by \$1.3 billion
- Added 34,171 jobs
- Paid an additional \$353.8 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 22,711,131 | \$ 8,177,992 | 56.27% |
| Earnings (\$1,000) | \$ 3,626,089 | \$ 1,302,349 | 56.05% |
| Employment (Jobs) | 95,032 | 34,171 | 56.15% |
| Income Taxes Paid (\$1,000) | \$ 985,208 | \$ 353,848 | 56.05% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 478,972 | | |

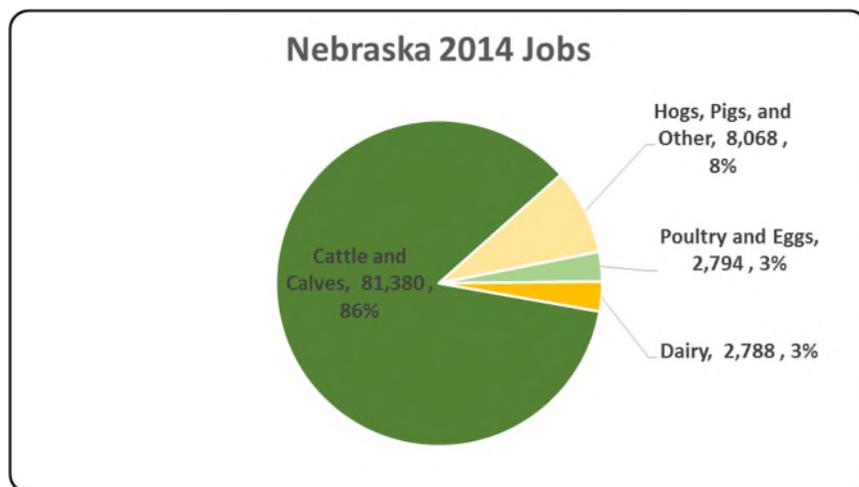
Nebraska Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Nebraska economy. Animal agriculture’s impact on Nebraska total economic output is about \$22.7 billion.



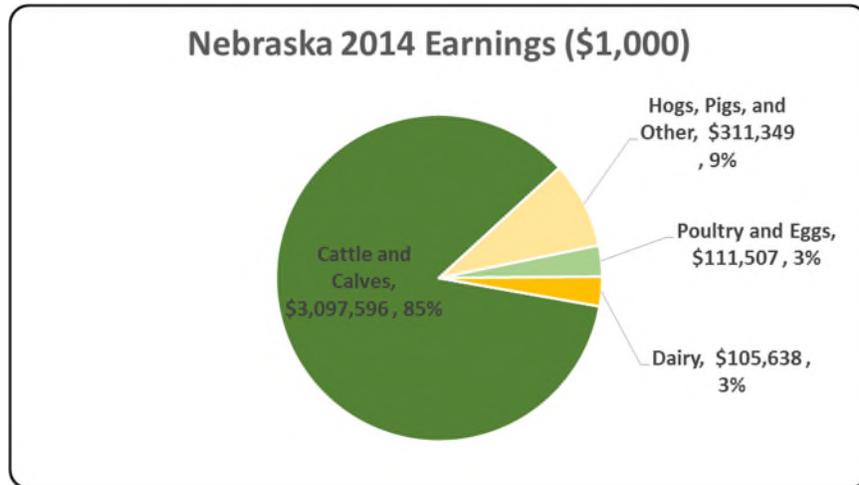
Nebraska Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Nebraska in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Nebraska total jobs, contributing 95,032 jobs within and outside of animal agriculture.



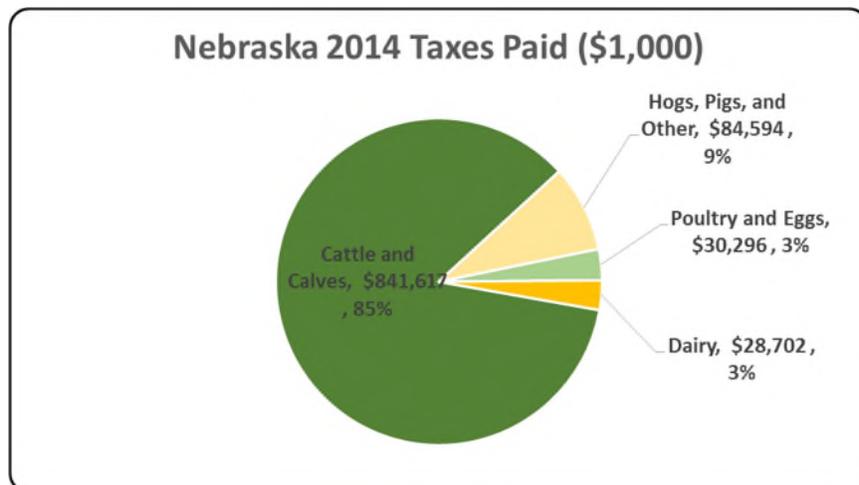
Nebraska Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Nebraska economy in terms of earnings. Nebraska’s animal agriculture contributed about \$3.6 billion to household earnings in 2014.



Nebraska Taxes Paid by Animal Agriculture

Nebraska’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$985.2 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$479.0 million in property taxes paid by all of Nebraska agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



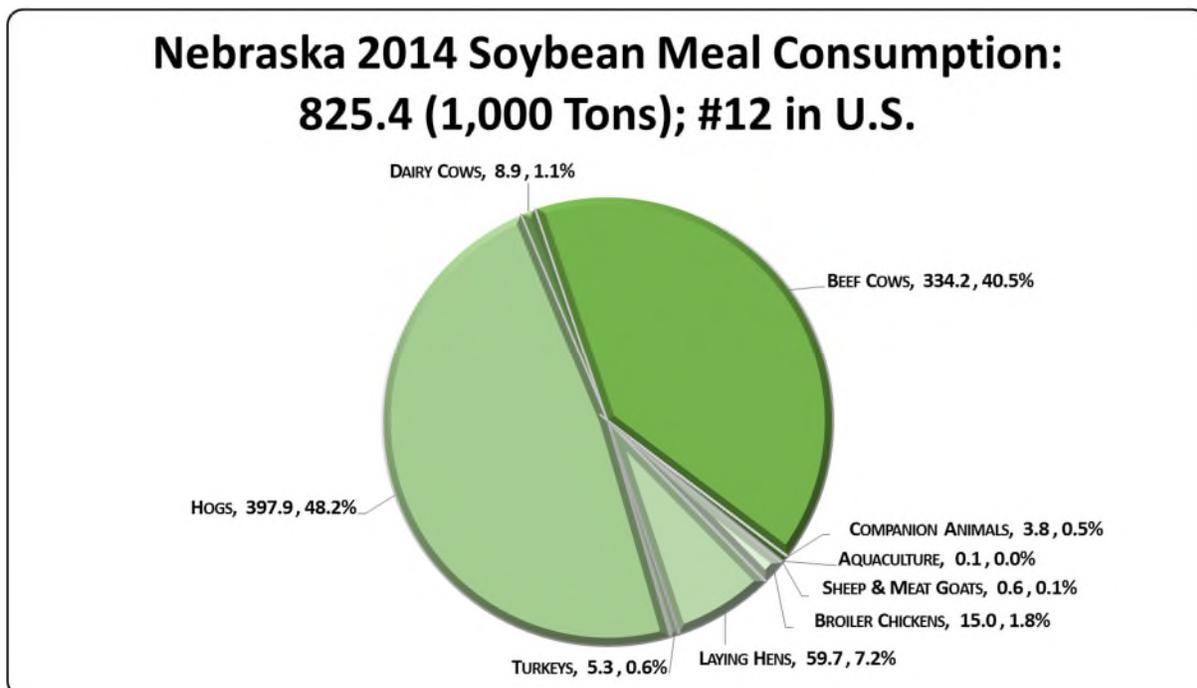
Nebraska Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Nebraska's animal agriculture consumed almost 825.4 thousand tons of soybean meal in 2014, placing the state as #12 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (397.9 thousand tons)
- Beef Cows (334.2 thousand tons)
- Egg-Laying Hens (59.7 thousand tons)

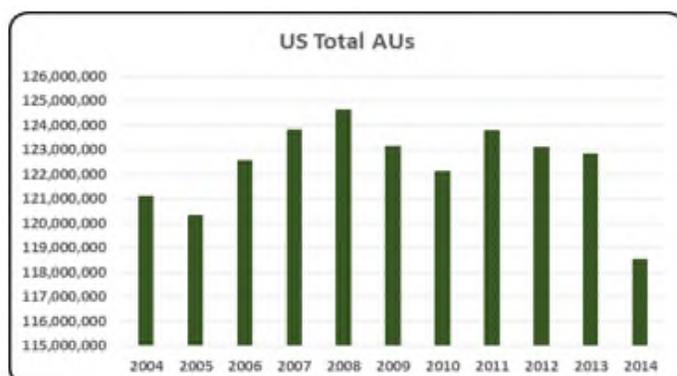


Nebraska Animal Unit (AU) Trends

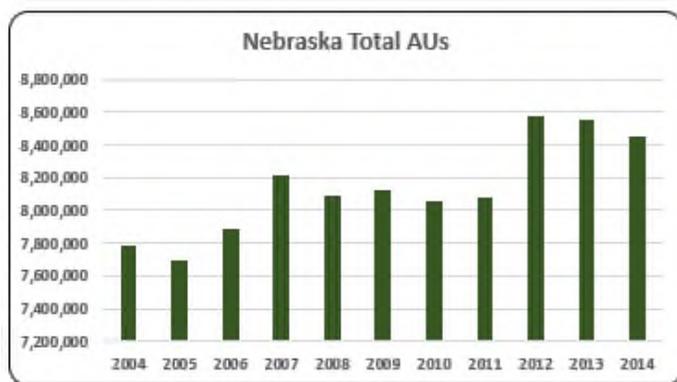
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Nebraska. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Nebraska and to give perspective on Nebraska's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

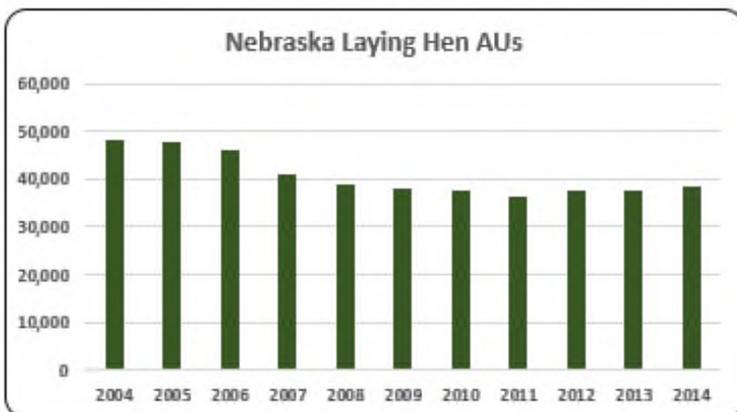
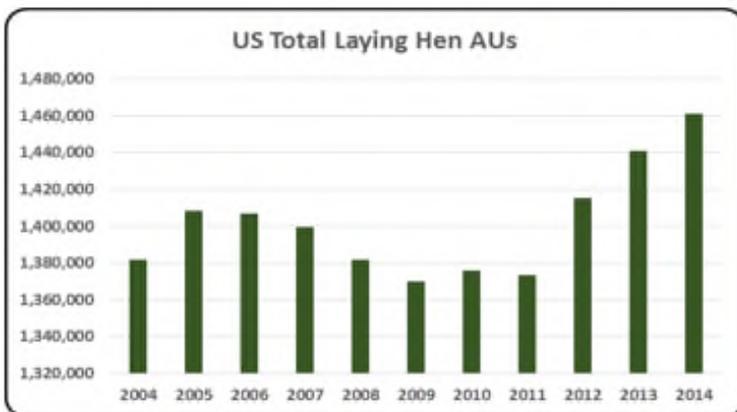
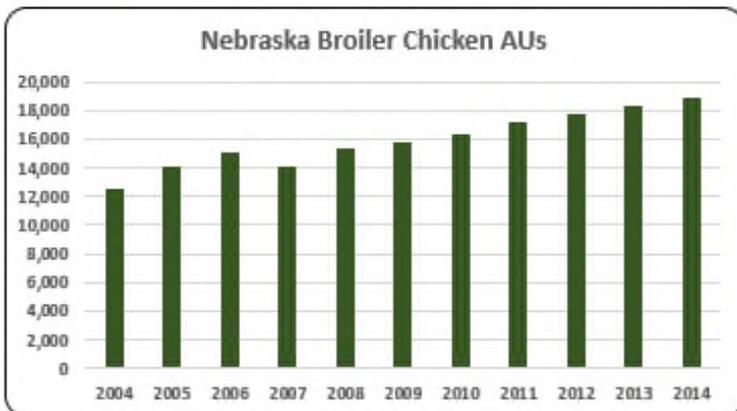
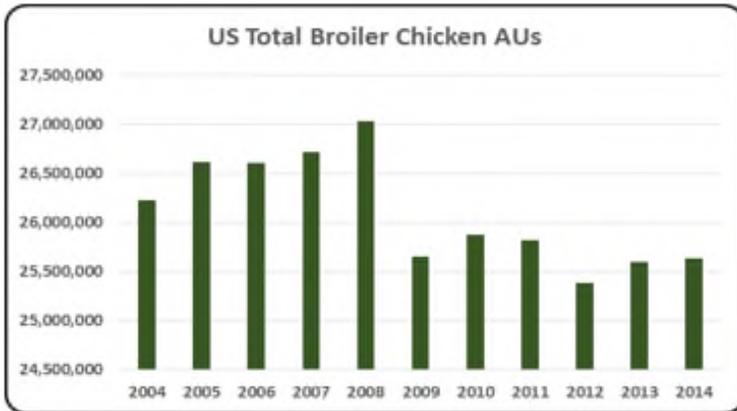
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Nebraska, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (7,220.6 thousand AUs), Hogs (1,087.1 thousand AUs), and Dairy Cows (74.2 thousand AUs). Total animal units in Nebraska during 2014 were 8,448.3 thousand AUs.



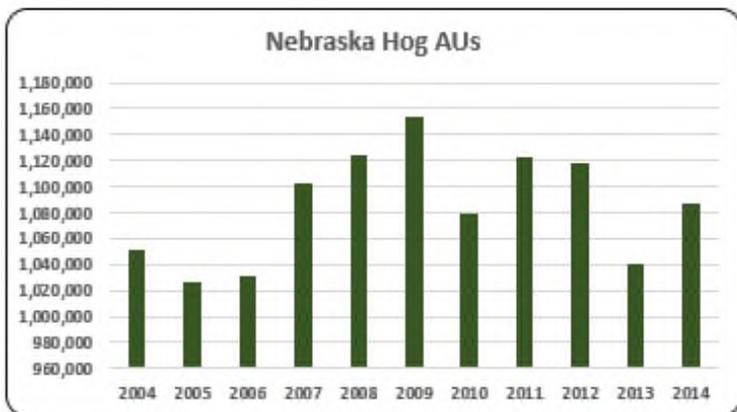
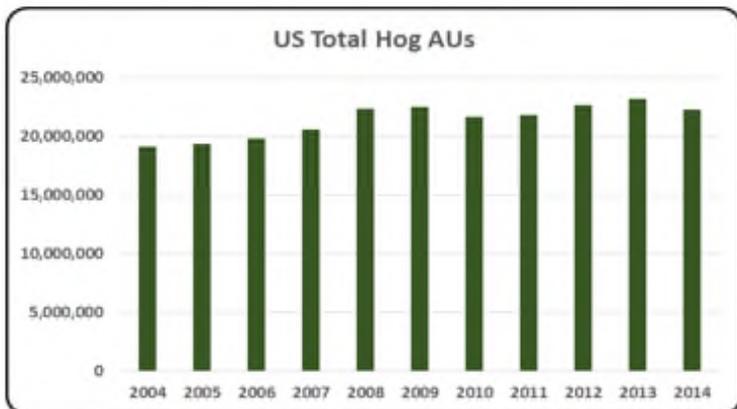
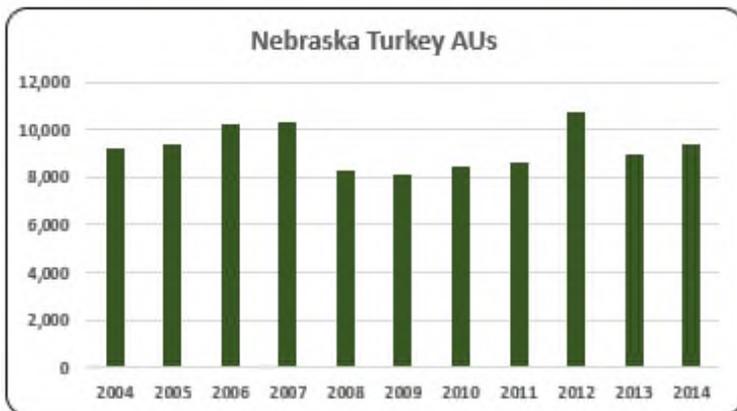
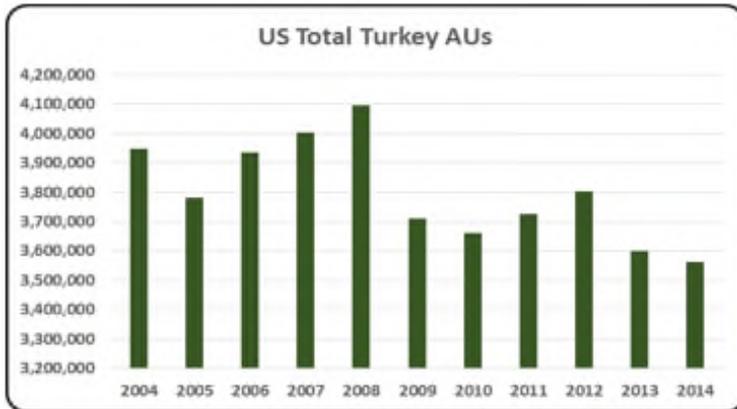
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



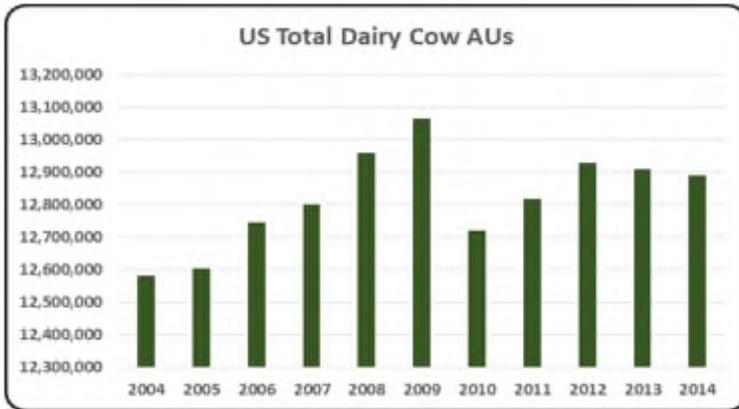
- The number of AUs in Nebraska decreased 1.2% to 8,448.3 thousand in 2014 relative to 2013. However AUs have risen 8% during the 2004-2014 period. The increase has been driven by the growth in beef cow production.



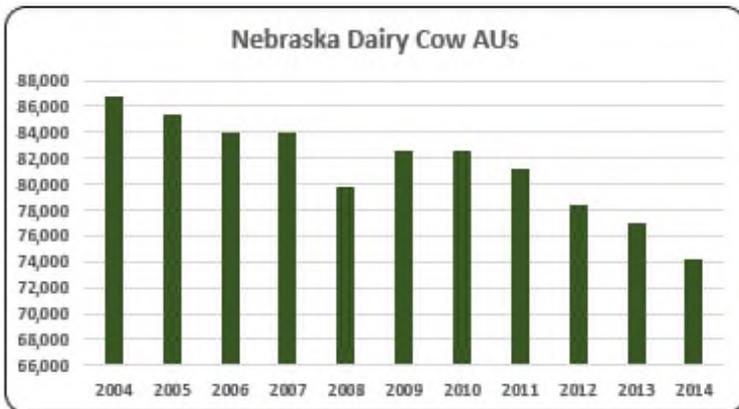
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production in Nebraska represented only 0.2% (18,875 broiler AUs) of all animal production in 2014. The average broiler AUs from 2004 to 2014 has been 15,968.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Less than 0.5% (38,265) of all AUs in the state of Nebraska came from layer production in 2014. Layer production has declined 20% since 2004.



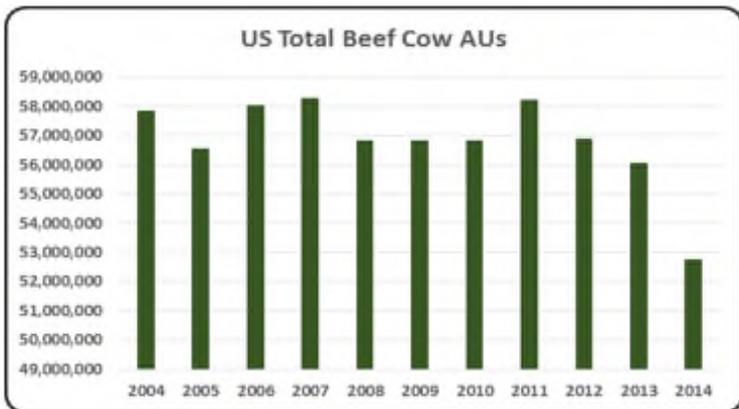
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- From 2013 to 2014 turkey production averaged about 9,151 turkey AUs remaining 15% lower than the high record turkey production in 2010 (10,731 turkey AUs).
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- About 5% (1,087.1 thousand) of hog production in the U.S. came from Nebraska in 2014. Production in 2014 remained 6% behind record high production in 2009 (1,153.1 thousand).



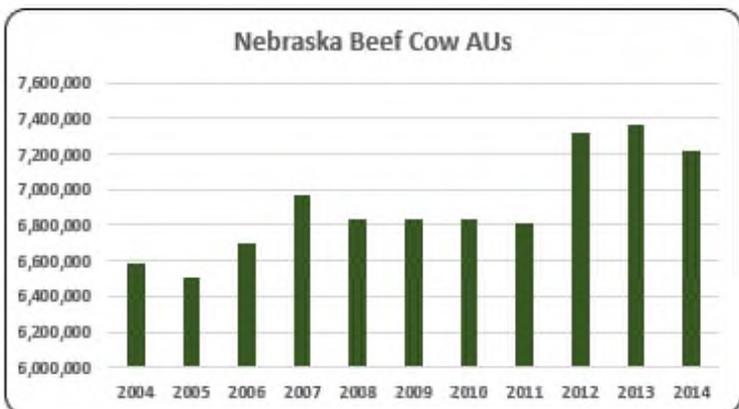
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production represented less than 1% (74,200 dairy cow AUs) of all animal production in the state in 2014. Dairy cow production has dropped 15% during the 2004-2014 decade.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production in Nebraska represented 85.5% (7,220.6 AUs) of all animal production in 2014. The industry has climbed 10% since the beginning of the decade.

Nebraska Additional Information and Methodology

Animal agriculture is an important part of Nebraska's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Nebraska, of interest is the degree to which the industry impacts the Nebraska economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Nebraska animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Nebraska's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Nebraska which have occurred. As shown in this state report, Nebraska has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Nebraska. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Nebraska Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Nebraska's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Nebraska, \$1.863 to \$2.630 million in total economic activity, \$0.307 to \$0.418 in household wages and 8 to 11 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.6300 | \$ 0.4178 | 11.0 |
| | Hogs, Pigs, and Other | \$ 1.8633 | \$ 0.3068 | 8.0 |
| | Poultry and Eggs | \$ 2.5575 | \$ 0.4074 | 10.2 |
| | Dairy | \$ 2.0794 | \$ 0.3536 | 9.3 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 6,581,850 | 6,509,850 | 6,701,850 | 6,965,850 | 6,827,850 | 6,827,850 | 6,827,850 | 6,813,900 | 7,318,650 | 7,367,100 | 7,220,550 |
| | Hog and Pig AUs | 1,051,200 | 1,026,900 | 1,031,850 | 1,102,350 | 1,124,700 | 1,153,050 | 1,079,550 | 1,122,000 | 1,117,650 | 1,040,250 | 1,087,050 |
| | Broiler AUs | 12,589 | 14,143 | 15,023 | 14,117 | 15,333 | 15,830 | 16,362 | 17,246 | 17,794 | 18,334 | 18,875 |
| | Turkey AUs | 9,189 | 9,424 | 10,240 | 10,340 | 8,265 | 8,096 | 8,433 | 8,583 | 10,731 | 8,952 | 9,349 |
| | Egg Layer AUs | 48,000 | 47,712 | 46,140 | 40,936 | 38,940 | 38,020 | 37,484 | 36,252 | 37,393 | 37,439 | 38,265 |
| | Dairy AUs | 86,800 | 85,400 | 84,000 | 84,000 | 79,800 | 82,600 | 82,600 | 81,200 | 78,400 | 77,000 | 74,200 |
| | Total Animal Units | 7,789,628 | 7,693,429 | 7,889,103 | 8,217,593 | 8,094,888 | 8,125,446 | 8,052,279 | 8,079,181 | 8,580,619 | 8,549,076 | 8,448,289 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 3,605,457 | \$ 3,874,740 | \$ 4,094,920 | \$ 4,246,461 | \$ 4,201,844 | \$ 3,746,363 | \$ 4,108,779 | \$ 5,044,827 | \$ 5,820,360 | \$ 5,860,830 | \$ 7,414,063 |
| | Hogs and Pigs (\$1,000) | \$ 717,121 | \$ 727,650 | \$ 699,144 | \$ 727,299 | \$ 710,448 | \$ 622,442 | \$ 800,932 | \$ 913,304 | \$ 842,576 | \$ 844,760 | \$ 1,004,858 |
| | Broilers (\$1,000) | \$ 11,430 | \$ 12,232 | \$ 11,322 | \$ 12,330 | \$ 8,556 | \$ 5,160 | \$ 3,331 | \$ 14,200 | \$ 15,064 | \$ 15,798 | \$ 16,124 |
| | Turkeys (\$1,000) | \$ 8,526 | \$ 9,041 | \$ 10,685 | \$ 11,925 | \$ 11,163 | \$ 7,486 | \$ 10,030 | \$ 11,249 | \$ 15,564 | \$ 10,249 | \$ 17,161 |
| | Eggs (\$1,000) | \$ 138,851 | \$ 82,989 | \$ 96,358 | \$ 185,092 | \$ 225,242 | \$ 146,859 | \$ 152,857 | \$ 169,837 | \$ 180,838 | \$ 197,279 | \$ 240,418 |
| | Milk (\$1,000) | \$ 169,938 | \$ 165,858 | \$ 149,812 | \$ 202,100 | \$ 204,687 | \$ 160,532 | \$ 202,064 | \$ 249,849 | \$ 232,456 | \$ 244,650 | \$ 298,750 |
| | Other | \$ 9,887 | \$ 10,376 | \$ 9,195 | \$ 9,399 | \$ 9,308 | \$ 9,124 | \$ 10,975 | \$ 9,877 | \$ 9,908 | \$ 9,939 | \$ 9,970 |
| | Sheep and Lambs (\$1,000) | \$ 8,219 | \$ 8,626 | \$ 7,363 | \$ 7,485 | \$ 7,312 | \$ 7,046 | \$ 8,816 | \$ 7,635 | \$ 7,585 | \$ 7,534 | \$ 7,483 |
| | Aquaculture (\$1,000) | \$ 1,668 | \$ 1,750 | \$ 1,832 | \$ 1,914 | \$ 1,996 | \$ 2,078 | \$ 2,159 | \$ 2,241 | \$ 2,323 | \$ 2,405 | \$ 2,487 |
| | Total (\$1,000) | \$ 4,661,210 | \$ 4,882,886 | \$ 5,071,436 | \$ 5,394,605 | \$ 5,371,247 | \$ 4,697,966 | \$ 5,288,968 | \$ 6,413,142 | \$ 7,116,766 | \$ 7,183,506 | \$ 9,001,344 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|-------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 12,886 | 12,709 | 10,775 | 11,788 | |
| | Cattle feedlots (112112) | 2,371 | 2,511 | 1,534 | 1,083 | |
| | Dairy cattle and milk production (11212) | 603 | 507 | 267 | 247 | |
| | Hog and pig farming (1122) | 2,563 | 1,302 | 936 | 644 | |
| | Poultry and egg production (1123) | 149 | 173 | 489 | 282 | |
| | Sheep and goat farming (1124) | 428 | 464 | 558 | 837 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,377 | 2,360 | 2,489 | 3,954 | |
| Value of Sales (\$1,000) | Cattle and Calves | 4,967,832 | 5,401,018 | 7,358,555 | 10,098,166 | |
| | Hogs and Pigs | 788,827 | 590,581 | 923,209 | 1,085,828 | |
| | Poultry and Eggs | 149,559 | 142,442 | 165,265 | 216,370 | |
| | Milk and Other Dairy Products | 124,134 | 148,941 | 172,066 | 219,724 | |
| | Aquaculture | 2,154 | 2,170 | 3,826 | 3,550 | |
| | Other (calculated) | 23,624 | 30,240 | 39,789 | 44,375 | |
| | Total | 6,056,130 | 6,315,392 | 8,662,710 | 11,668,013 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 19,837 | 16,074 | 13,253 | 16,094 | |
| | | \$1,000 | 2,405,077 | 3,211,783 | 4,066,702 | 5,117,496 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 9,741 | 8,516 | 10,656 | |
| | | \$1,000 | <i>n/a</i> | 90,966 | 175,943 | 251,297 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 9,173 | 6,927 | 8,217 | |
| | | \$1,000 | <i>n/a</i> | 3,120,817 | 3,890,759 | 4,866,199 |
| Feed purchased | (Farms) | 28,251 | 26,376 | 21,335 | 28,254 | |
| | \$1,000 | 1,408,802 | 1,490,523 | 2,045,635 | 3,981,917 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|----------------------|---------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 19,498,986 | \$ 3,097,596 | 81,380 | \$ 841,617 |
| | Hogs, Pigs, and Other | \$ 1,890,929 | \$ 311,349 | 8,068 | \$ 84,594 |
| | Poultry and Eggs | \$ 699,995 | \$ 111,507 | 2,794 | \$ 30,296 |
| | Dairy | \$ 621,221 | \$ 105,638 | 2,788 | \$ 28,702 |
| | Total | \$ 22,711,131 | \$ 3,626,089 | 95,032 | \$ 985,208 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 7,615,375 | \$ 1,209,773 | 31,783 | \$ 328,695 |
| | Hogs, Pigs, and Other | \$ 193,255 | \$ 31,820 | 825 | \$ 8,646 |
| | Poultry and Eggs | \$ 190,996 | \$ 30,425 | 762 | \$ 8,266 |
| | Dairy | \$ 178,366 | \$ 30,331 | 801 | \$ 8,241 |
| | Total | \$ 8,177,992 | \$ 1,302,349 | 34,171 | \$ 353,848 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.6300 | \$ 0.4178 | 11.0 | |
| | Hogs, Pigs, and Other | \$ 1.8633 | \$ 0.3068 | 8.0 | |
| | Poultry and Eggs | \$ 2.5575 | \$ 0.4074 | 10.2 | |
| | Dairy | \$ 2.0794 | \$ 0.3536 | 9.3 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 6.8% | |
| | Total | | | 27.2% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: NEVADA

Nevada Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Nevada's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Nevada. The success of Nevada animal agriculture in turn has an impact on the rest of the state and regional economies. For example, in the state of Nevada during 2014 animal agriculture contributed:

- \$881.6 million in economic output
- 5,577 jobs
- \$144.7 million in earnings
- \$29.4 million in income taxes paid at local, state, and federal levels
- \$17.9 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Nevada increased economic output by over \$310.9 million, boosted household earnings by \$51.4 million, contributed 1,959 additional jobs and paid \$10.4 million in additional tax revenues.

Nevada's animal agriculture consumed about 14.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (3.6 thousand tons)
- Companion Animals (3.6 thousand tons)
- Turkeys (2.7 thousand tons)

This report examines animal agriculture in Nevada over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Nevada, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a contributor to the economic well-being of the people of Nevada and beyond.

Nevada Economic Impact of Animal Agriculture

Animal agriculture is a modest part of Nevada's economy. In 2014, Nevada's animal agriculture contributed the following to the economy:

- About \$881.6 million in economic output
- \$144.7 million in household earnings
- 5,577 jobs
- \$29.4 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade Nevada's animal agriculture has:

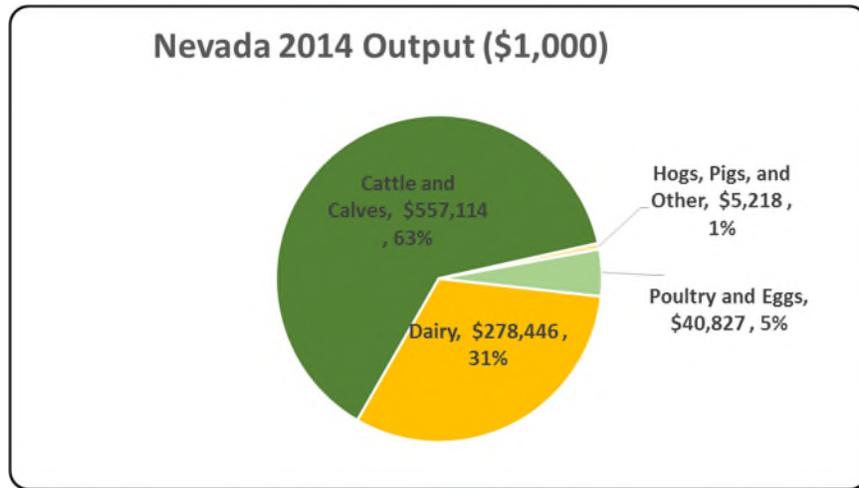
- Increased economic output by \$310.9 million
- Boosted household earnings by \$51.4 million
- Added 1,959 jobs
- Paid an additional \$10.4 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|------------|------------------|--------------------|
| Output (\$1,000) | \$ 881,606 | \$ 310,855 | 54.46% |
| Earnings (\$1,000) | \$ 144,671 | \$ 51,370 | 55.06% |
| Employment (Jobs) | 5,577 | 1,959 | 54.16% |
| Income Taxes Paid (\$1,000) | \$ 29,412 | \$ 10,444 | 55.06% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 17,948 | | |

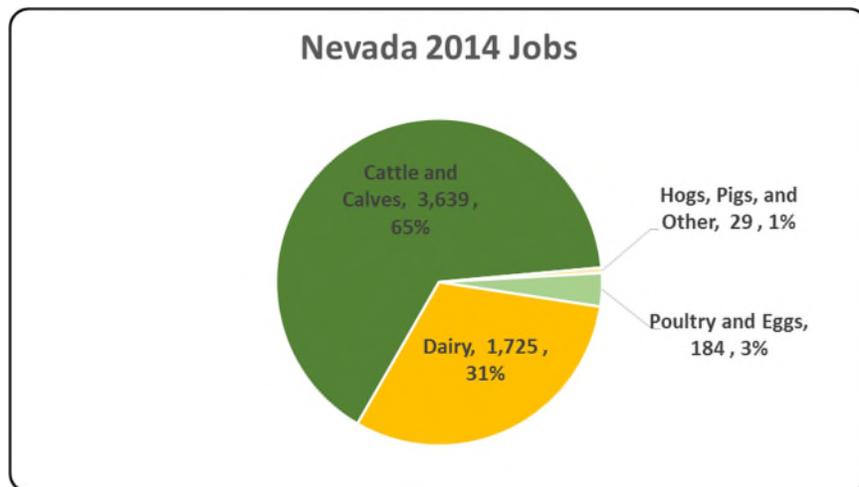
Nevada Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Nevada economy. Animal agriculture’s impact on Nevada total economic output is about \$881.6 million.



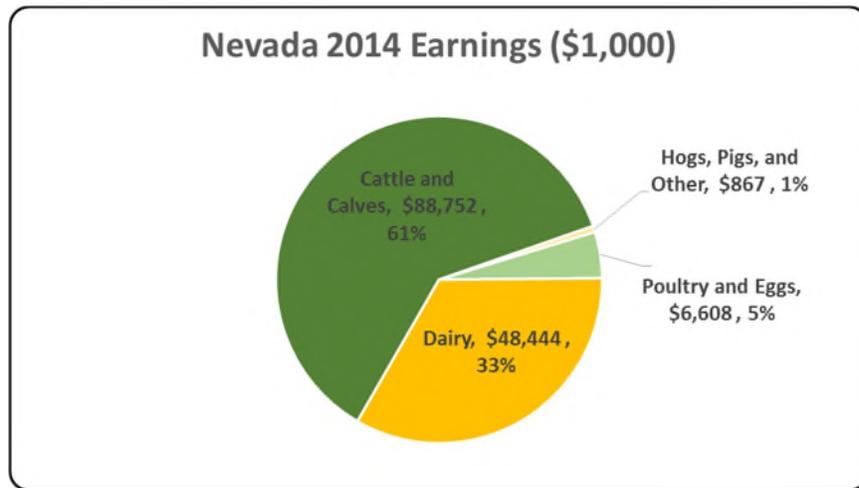
Nevada Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Nevada in terms of animal agriculture jobs. As shown, animal agriculture contributes about 5,577 jobs within and outside of animal agriculture.



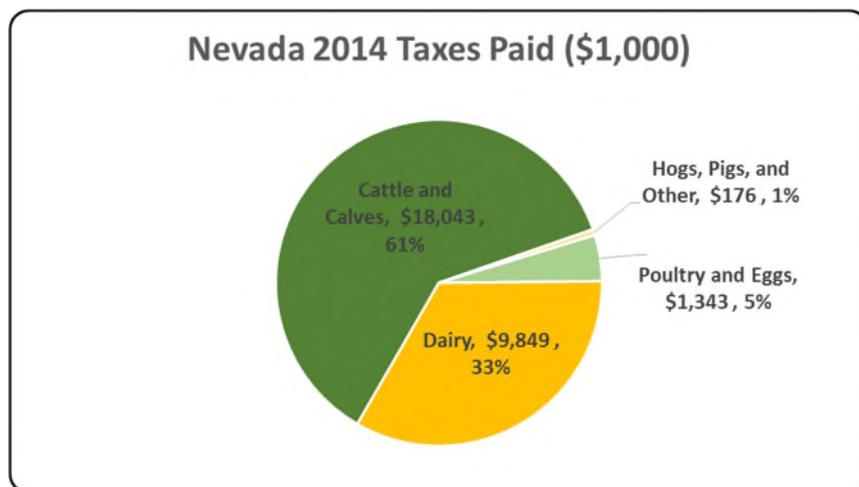
Nevada Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Nevada economy in terms of earnings. Nevada’s animal agriculture contributed about \$144.7 million to household earnings in 2014.



Nevada Taxes Paid by Animal Agriculture

Nevada’s animal agriculture is also a source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$29.4 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$17.9 million in property taxes paid by all of Nevada agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



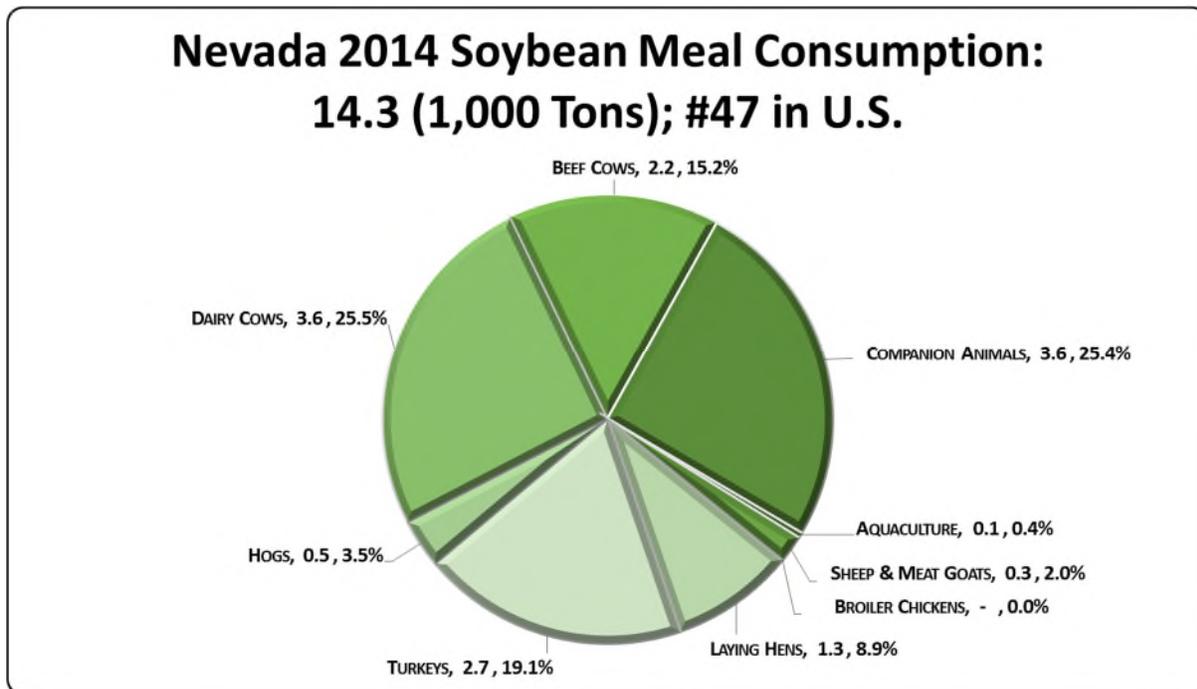
Nevada Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Nevada’s animal agriculture consumed almost 14.3 thousand tons of soybean meal in 2014, placing the state as #47 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (3.6 thousand tons)
- Companion Animals (3.6 thousand tons)
- Turkeys (2.7 thousand tons)

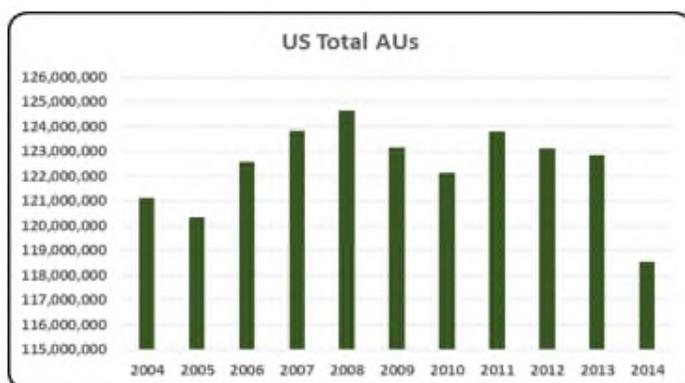


Nevada Animal Unit (AU) Trends

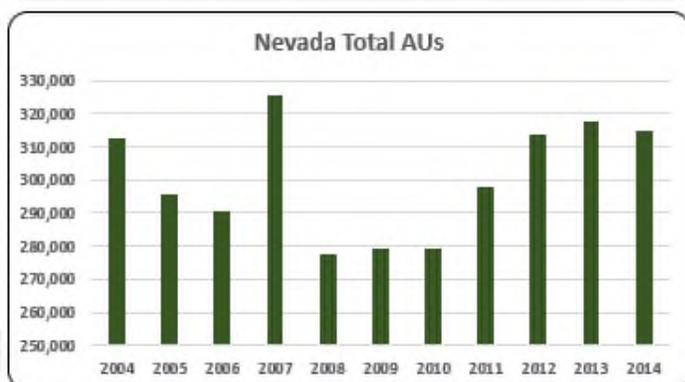
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Nevada. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Nevada and to give perspective on Nevada's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

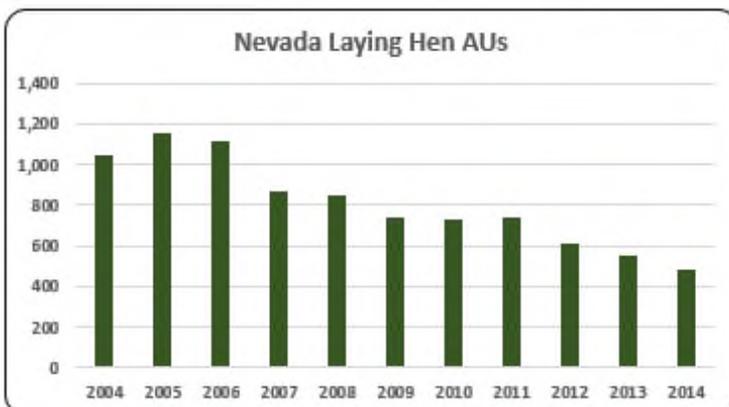
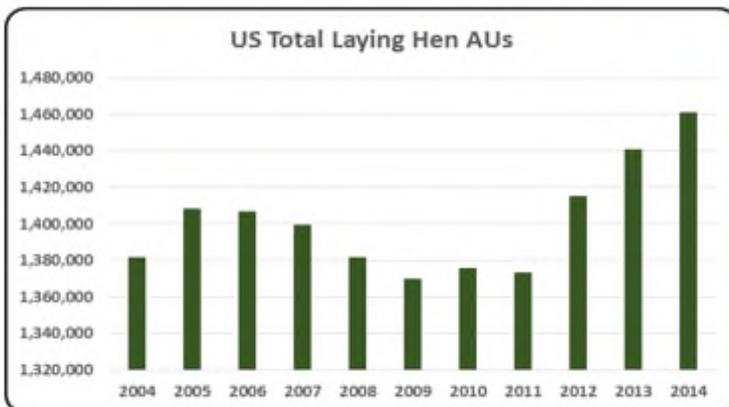
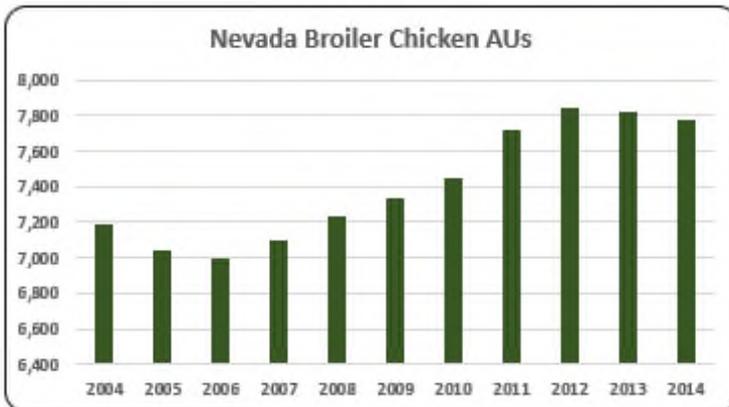
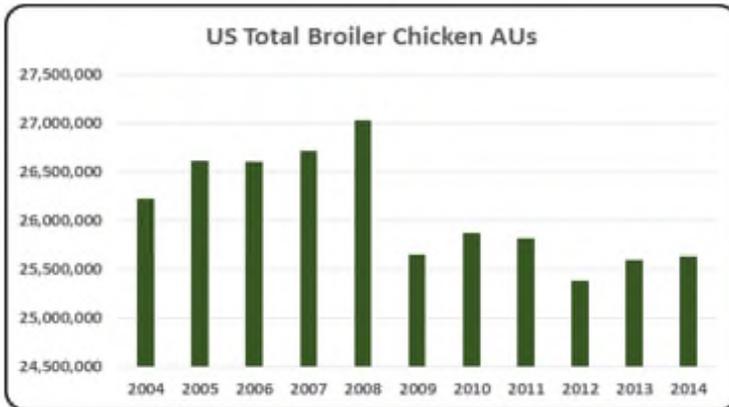
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Nevada, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (260.3 thousand AUs), Dairy Cows (40.6 thousand AUs), and Broilers (7.8 thousand AUs). Total animal units in Nevada during 2014 were 315 thousand AUs.



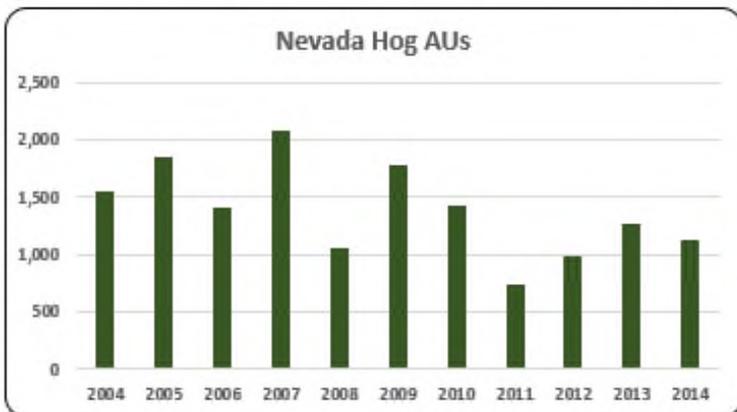
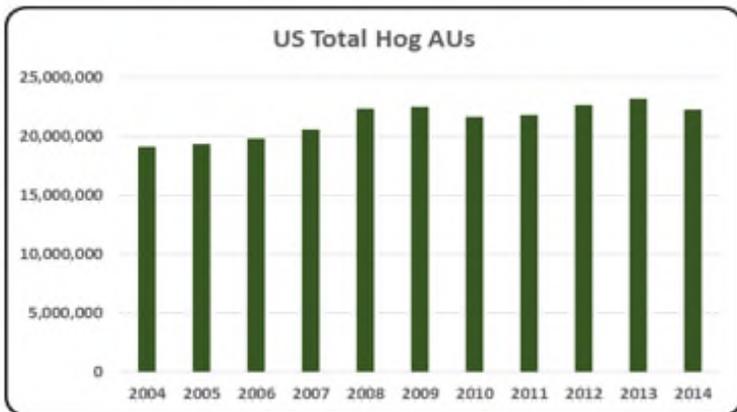
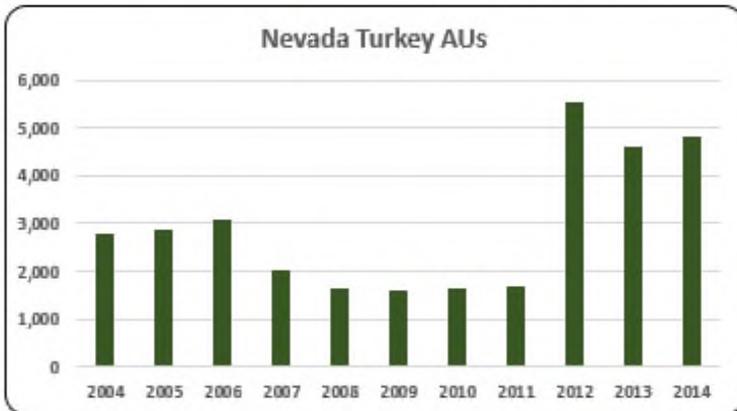
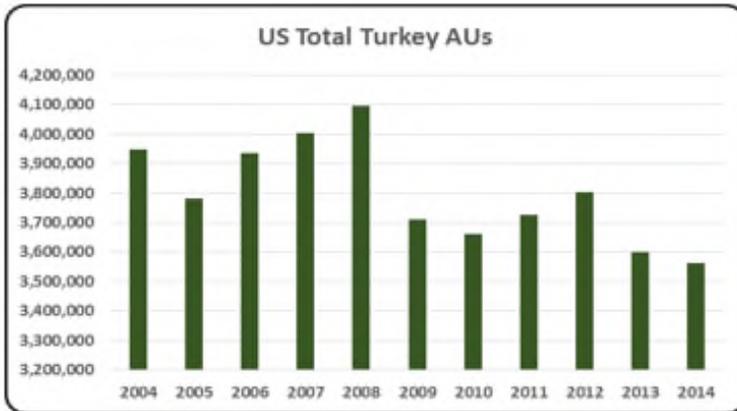
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



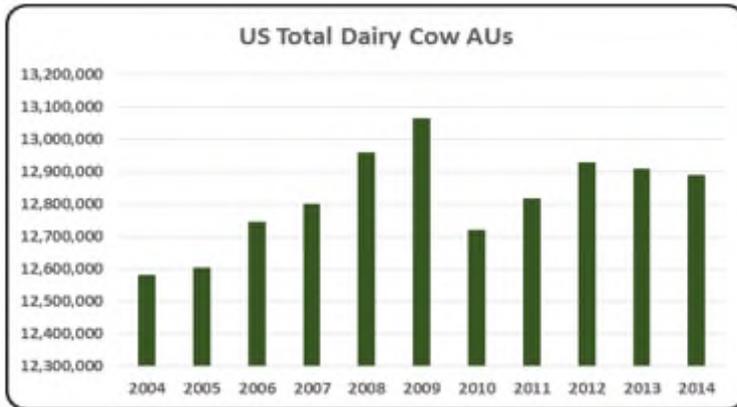
- All (315,048) AUs in Nevada in 2014 represented only 0.27% of all AUs in the U.S. 2007 was a record year with 325,589 AUs. Beef cow production is the main animal production in the state.



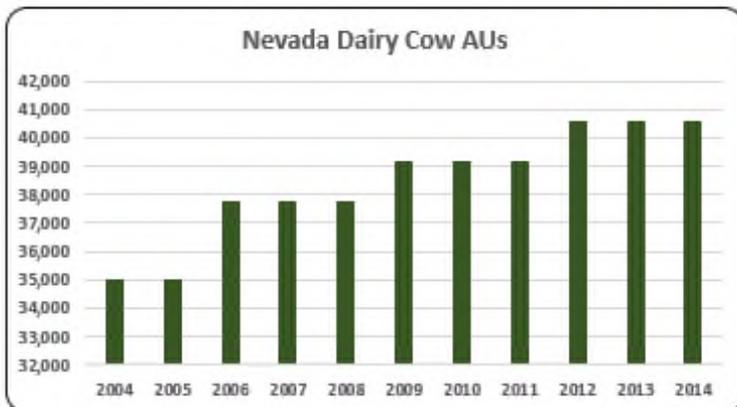
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- There were 7,772 broiler AUs in 2014, declining less than 1% year-over-year. Overall there has been an upward trend in broiler production the state of Nevada, and broiler production increased 8.1% from a decade ago.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Only 0.2% (485 layer AUs) of animal production was from layer production in 2014. Layer production decreased 54% since 2004 (1,048 layer AUs).



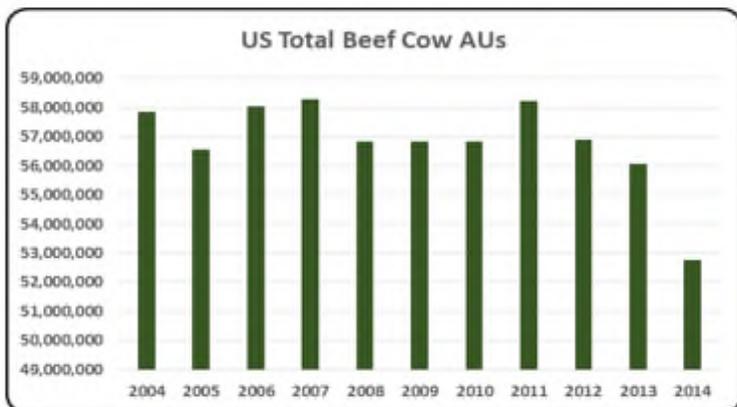
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production was less than 2% (4,816 turkey AUs) of total animal production in the state in 2014. However, turkey production in 2014 rose 74% relative to production in 2004. Turkey numbers were 13% below record high production in 2012 (5,528).
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production in Nevada was irregular during 2004 to 2014, but the general trend has been negative. Hog AUs was 1,125 in 2014.



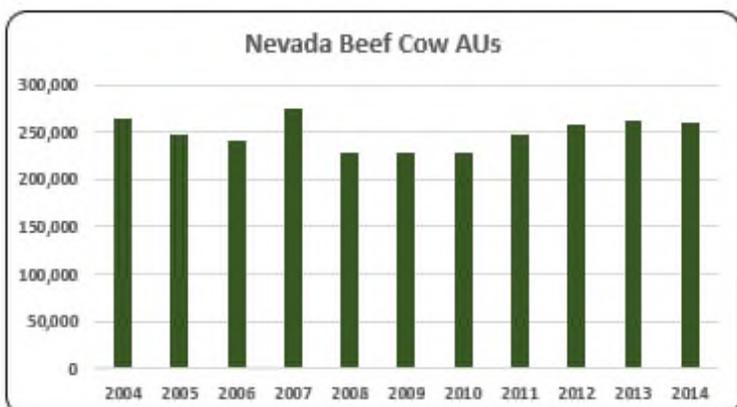
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Overall dairy cow production increased throughout the decade from 35,000 dairy cow AUs in 2004 to 40,600 dairy cow AUs in 2014. Production has been steady at 40,600 dairy cow AUs since 2012.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- There were 260,250 beef cow AUs in Nevada in 2014, which declined less than 1% from the previous year. 2007 was a record year with 275,700 dairy cow AUs.

Nevada Additional Information and Methodology

Animal agriculture is a moderate part of Nevada's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Nevada, of interest is the degree to which the industry impacts the Nevada economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Nevada animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Nevada's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Nevada which have occurred. As shown in this state report, Nevada has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Nevada. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Nevada Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Nevada’s economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of “per million dollars” of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Nevada, \$1.401 to \$1.925 million in total economic activity, \$0.227 to \$0.307 in household wages and 6 to 13 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.9246 | \$ 0.3066 | 12.6 |
| | Hogs, Pigs, and Other | \$ 1.4829 | \$ 0.2465 | 8.3 |
| | Poultry and Eggs | \$ 1.4012 | \$ 0.2268 | 6.3 |
| | Dairy | \$ 1.6272 | \$ 0.2831 | 10.1 |

Appendix

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|-----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Animal Units (AUs) | Beef Cattle AUs | 264,900 | 247,650 | 240,150 | 275,700 | 228,750 | 228,750 | 228,750 | 247,950 | 258,150 | 262,650 | 260,250 |
| | Hog and Pig AUs | 1,545 | 1,845 | 1,410 | 2,085 | 1,050 | 1,770 | 1,425 | 735 | 990 | 1,260 | 1,125 |
| | Broiler AUs | 7,193 | 7,042 | 6,994 | 7,099 | 7,232 | 7,333 | 7,449 | 7,723 | 7,844 | 7,817 | 7,772 |
| | Turkey AUs | 2,781 | 2,852 | 3,099 | 2,037 | 1,628 | 1,595 | 1,661 | 1,691 | 5,528 | 4,612 | 4,816 |
| | Egg Layer AUs | 1,048 | 1,154 | 1,113 | 869 | 844 | 738 | 733 | 738 | 614 | 549 | 485 |
| | Dairy AUs | 35,000 | 35,000 | 37,800 | 37,800 | 37,800 | 39,200 | 39,200 | 39,200 | 40,600 | 40,600 | 40,600 |
| | Total Animal Units | 312,467 | 295,543 | 290,567 | 325,589 | 277,304 | 279,385 | 279,218 | 298,036 | 313,726 | 317,488 | 315,048 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 159,252 | \$ 166,197 | \$ 151,803 | \$ 149,348 | \$ 156,432 | \$ 148,730 | \$ 171,771 | \$ 205,595 | \$ 220,560 | \$ 230,963 | \$ 289,470 |
| | Hogs and Pigs (\$1,000) | \$ 958 | \$ 1,029 | \$ 834 | \$ 1,220 | \$ 681 | \$ 992 | \$ 957 | \$ 725 | \$ 772 | \$ 936 | \$ 1,073 |
| | Broilers (\$1,000) | \$ 6,050 | \$ 5,731 | \$ 4,429 | \$ 4,959 | \$ 5,463 | \$ 5,902 | \$ 6,372 | \$ 7,089 | \$ 7,814 | \$ 9,520 | \$ 9,986 |
| | Turkeys (\$1,000) | \$ 2,580 | \$ 2,736 | \$ 3,234 | \$ 2,349 | \$ 2,199 | \$ 1,475 | \$ 1,976 | \$ 2,216 | \$ 8,018 | \$ 5,280 | \$ 8,840 |
| | Eggs (\$1,000) | \$ 6,161 | \$ 3,730 | \$ 4,135 | \$ 6,788 | \$ 8,180 | \$ 5,822 | \$ 6,391 | \$ 7,007 | \$ 7,859 | \$ 8,879 | \$ 10,310 |
| | Milk (\$1,000) | \$ 75,841 | \$ 78,590 | \$ 68,000 | \$ 100,646 | \$ 94,471 | \$ 69,882 | \$ 112,216 | \$ 137,862 | \$ 125,685 | \$ 129,717 | \$ 171,120 |
| | Other | \$ 2,273 | \$ 2,604 | \$ 1,730 | \$ 2,169 | \$ 2,086 | \$ 2,280 | \$ 2,628 | \$ 2,363 | \$ 2,391 | \$ 2,419 | \$ 2,446 |
| | Sheep and Lambs (\$1,000) | \$ 2,273 | \$ 2,604 | \$ 1,730 | \$ 2,169 | \$ 2,086 | \$ 2,280 | \$ 2,628 | \$ 2,363 | \$ 2,391 | \$ 2,419 | \$ 2,446 |
| | Aquaculture (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Total (\$1,000) | \$ 253,116 | \$ 260,617 | \$ 234,165 | \$ 267,479 | \$ 269,512 | \$ 235,083 | \$ 302,311 | \$ 362,857 | \$ 373,099 | \$ 387,713 | \$ 493,246 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|----------------|----------------|----------------|----------------|--------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 1,235 | 1,093 | 1,067 | 1,242 | |
| | Cattle feedlots (112112) | 47 | 81 | 20 | 12 | |
| | Dairy cattle and milk production (11212) | 41 | 45 | 35 | 26 | |
| | Hog and pig farming (1122) | 24 | 27 | 15 | 22 | |
| | Poultry and egg production (1123) | 29 | 63 | 64 | 72 | |
| | Sheep and goat farming (1124) | 109 | 157 | 184 | 340 | |
| | Animal aquaculture and other animal production (1125,1129) | 410 | 640 | 717 | 1,177 | |
| Value of Sales (\$1,000) | Cattle and Calves | 135,410 | 215,054 | 181,758 | 241,611 | |
| | Hogs and Pigs | 700 | 930 | withheld | 516 | |
| | Poultry and Eggs | 178 | withheld | withheld | 731 | |
| | Milk and Other Dairy Products | 55,456 | 62,074 | 98,526 | 125,569 | |
| | Aquaculture | n/a | withheld | withheld | 4,030 | |
| | Other (calculated) | 13,899 | 11,201 | 13,644 | 18,174 | |
| | Total | 205,643 | 289,259 | 293,928 | 390,631 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 1,015 | 908 | 994 | 1,412 | |
| | | \$1,000 | 26,424 | 34,954 | 4,470 | 38,987 |
| | Breeding livestock purchased | (Farms) n/a | 574 | 360 | 943 | |
| | | \$1,000 | n/a | 8,620 | 1,786 | 13,345 |
| | Other livestock and poultry purchased | (Farms) n/a | 447 | 768 | 701 | |
| | | \$1,000 | n/a | 26,335 | 2,684 | 25,641 |
| | Feed purchased | (Farms) 1,690 | 2,062 | 2,308 | 3,134 | |
| | \$1,000 | 48,969 | 58,036 | 30,644 | 140,663 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 557,114 | \$ 88,752 | 3,639 | \$ 18,043 |
| | Hogs, Pigs, and Other | \$ 5,218 | \$ 867 | 29 | \$ 176 |
| | Poultry and Eggs | \$ 40,827 | \$ 6,608 | 184 | \$ 1,343 |
| | Dairy | \$ 278,446 | \$ 48,444 | 1,725 | \$ 9,849 |
| | Total | \$ 881,606 | \$ 144,671 | 5,577 | \$ 29,412 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 173,002 | \$ 27,560 | 1,130 | \$ 5,603 |
| | Hogs, Pigs, and Other | \$ (786) | \$ (131) | (4) | \$ (27) |
| | Poultry and Eggs | \$ 14,852 | \$ 2,404 | 67 | \$ 489 |
| | Dairy | \$ 123,787 | \$ 21,536 | 767 | \$ 4,378 |
| | Total | \$ 310,855 | \$ 51,370 | 1,959 | \$ 10,444 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.9246 | \$ 0.3066 | 12.6 | |
| | Hogs, Pigs, and Other | \$ 1.4829 | \$ 0.2465 | 8.3 | |
| | Poultry and Eggs | \$ 1.4012 | \$ 0.2268 | 6.3 | |
| | Dairy | \$ 1.6272 | \$ 0.2831 | 10.1 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 0.0% |
| | Total | | | | 20.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: NEW HAMPSHIRE

New Hampshire Executive Summary

The use of soybean meal as a key feed ingredient is a small part of New Hampshire's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in New Hampshire. The success of New Hampshire animal agriculture in turn has a small impact on the rest of the state and regional economies. For example, in the state of New Hampshire during 2014 animal agriculture contributed:

- \$250.0 million in economic output
- 1,191 jobs
- \$41.3 million in earnings
- \$10.5 million in income taxes paid at local, state, and federal levels
- \$23.6 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in New Hampshire increased economic output by over \$66.3 million, boosted household earnings by \$10.7 million, contributed 294 additional jobs and paid \$2.7 million in additional tax revenues.

New Hampshire's animal agriculture consumed about 14,700 tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Turkeys (8,200 tons)
- Dairy Cows (2,300 tons)
- Egg-Laying Hens (2,200 tons)

This report examines animal agriculture in New Hampshire over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in New Hampshire, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of New Hampshire.

New Hampshire Economic Impact of Animal Agriculture

Animal agriculture is a small part of New Hampshire's economy. In 2014, New Hampshire's animal agriculture contributed the following to the economy:

- About \$250.0 million in economic output
- \$41.3 million in household earnings
- 1,191 jobs
- \$10.5 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade New Hampshire's animal agriculture has:

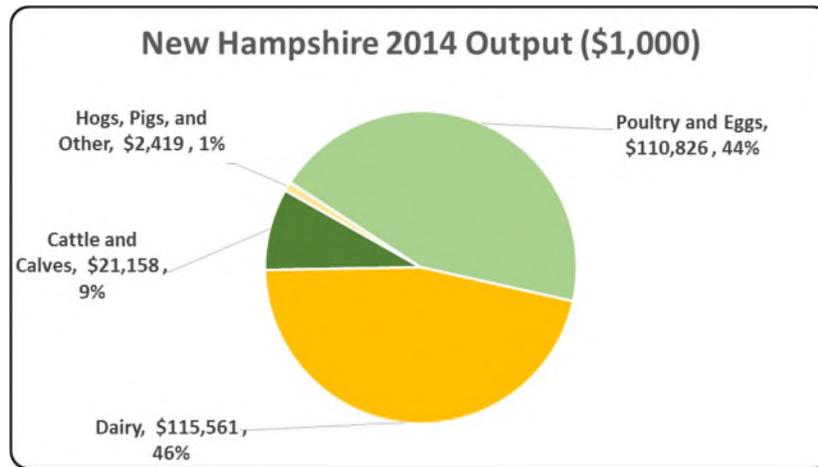
- Increased economic output by \$66.3 million
- Boosted household earnings by \$10.7 million
- Added 294 jobs
- Paid an additional \$2.7 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|------------|------------------|--------------------|
| Output (\$1,000) | \$ 249,965 | \$ 66,301 | 36.10% |
| Earnings (\$1,000) | \$ 41,297 | \$ 10,739 | 35.14% |
| Employment (Jobs) | 1,191 | 294 | 32.81% |
| Income Taxes Paid (\$1,000) | \$ 10,461 | \$ 2,720 | 35.14% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 23,589 | | |

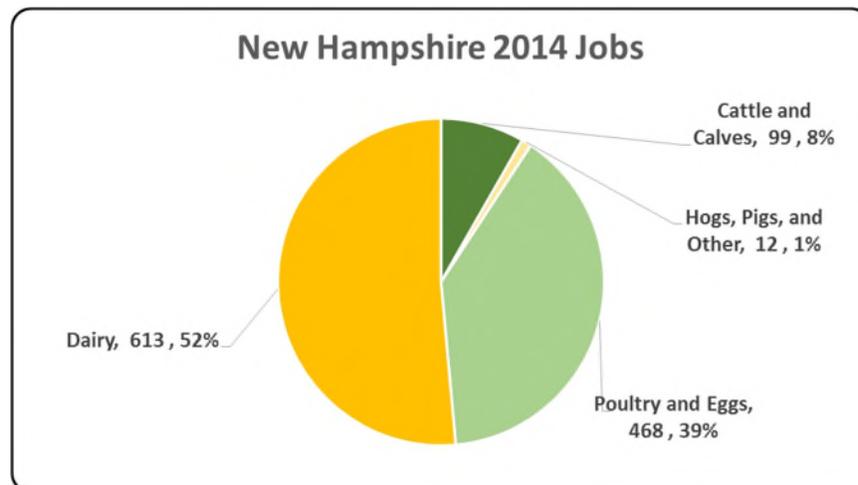
New Hampshire Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the New Hampshire economy. Animal agriculture’s impact on New Hampshire total economic output is about \$250.0 million.



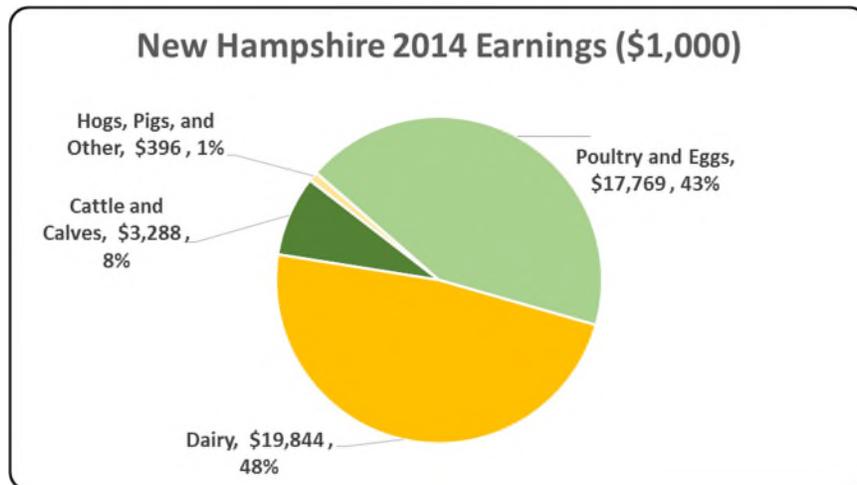
New Hampshire Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to New Hampshire in terms of animal agriculture jobs. As shown, animal agriculture contributes about 1,191 jobs within and outside of animal agriculture.



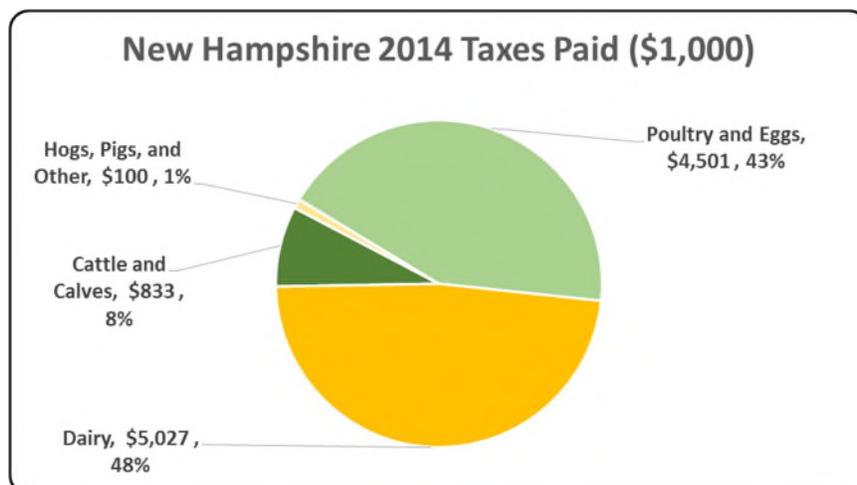
New Hampshire Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the New Hampshire economy in terms of earnings. New Hampshire’s animal agriculture contributed about \$41.3 million to household earnings in 2014.



New Hampshire Taxes Paid by Animal Agriculture

New Hampshire’s animal agriculture is also a source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$10.5 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$23.6 million in property taxes paid by all of New Hampshire agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



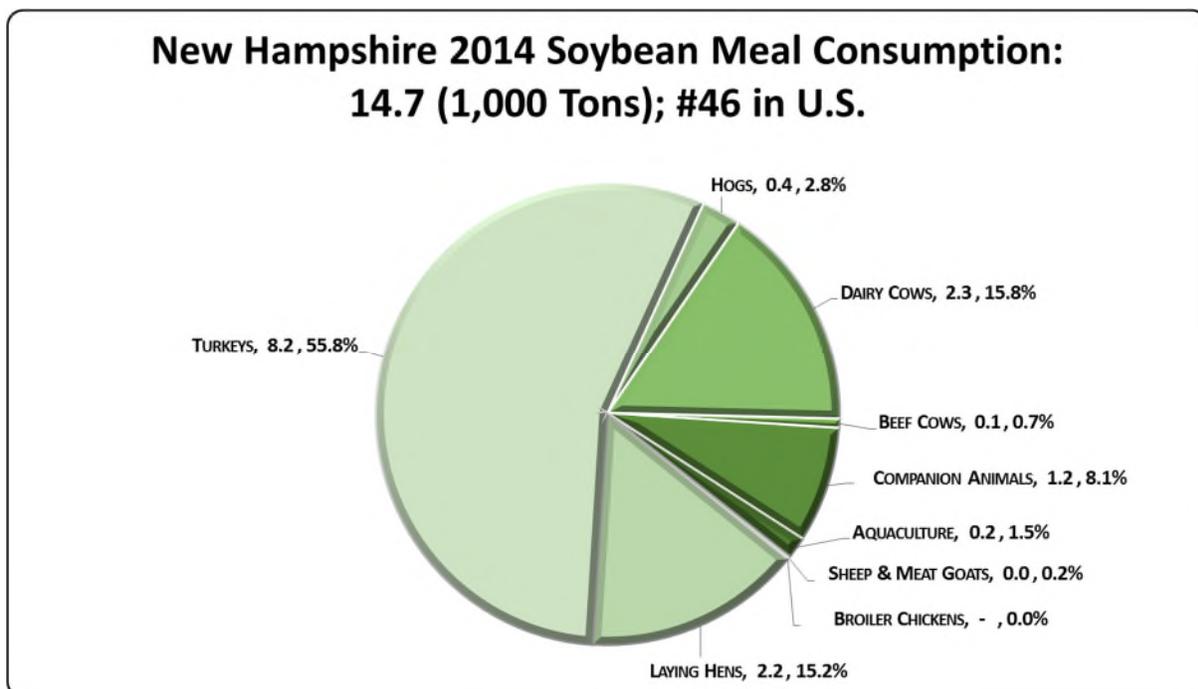
New Hampshire Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

New Hampshire's animal agriculture consumed almost 14,700 tons of soybean meal in 2014, placing the state as #46 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Turkeys (8,200 tons)
- Dairy Cows (2,300 tons)
- Egg-Laying Hens (2,200 tons)

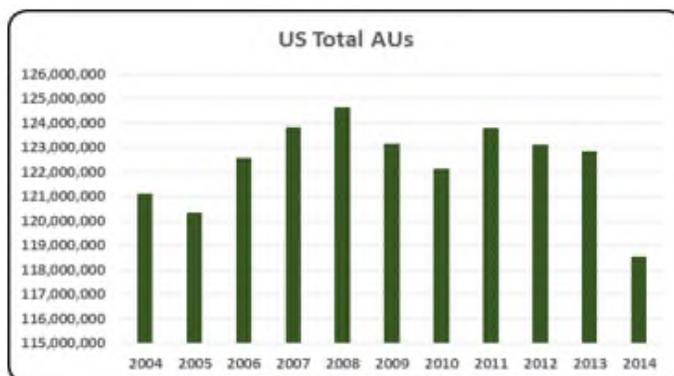


New Hampshire Animal Unit (AU) Trends

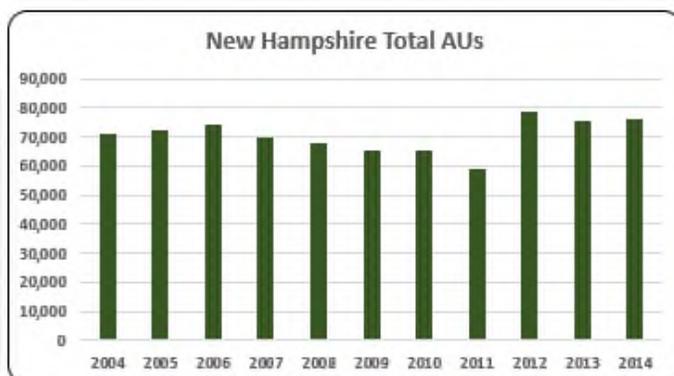
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of New Hampshire. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to New Hampshire and to give perspective on New Hampshire's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

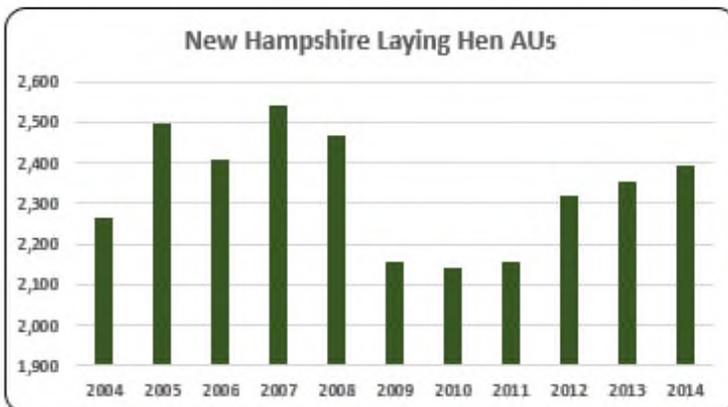
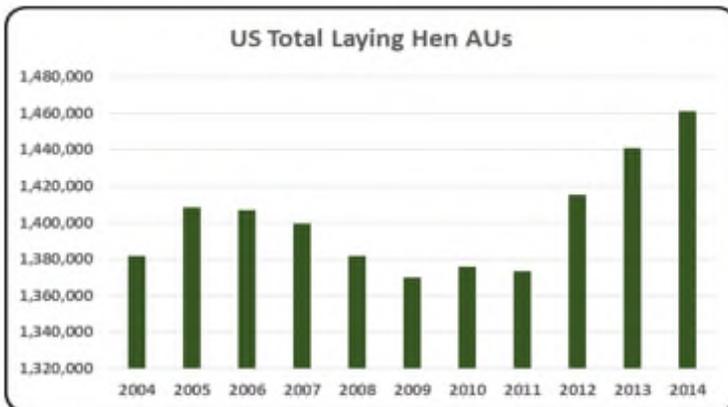
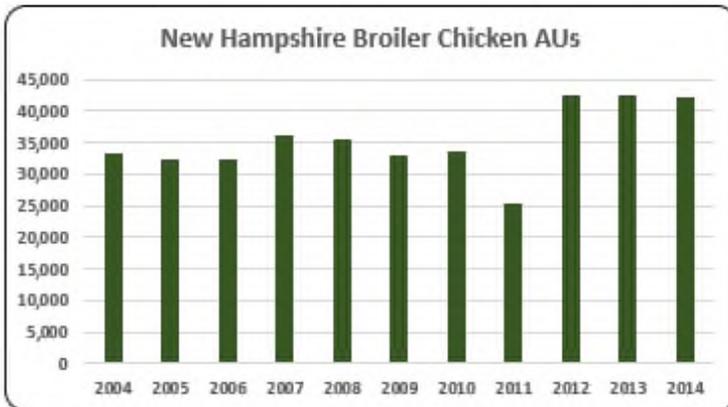
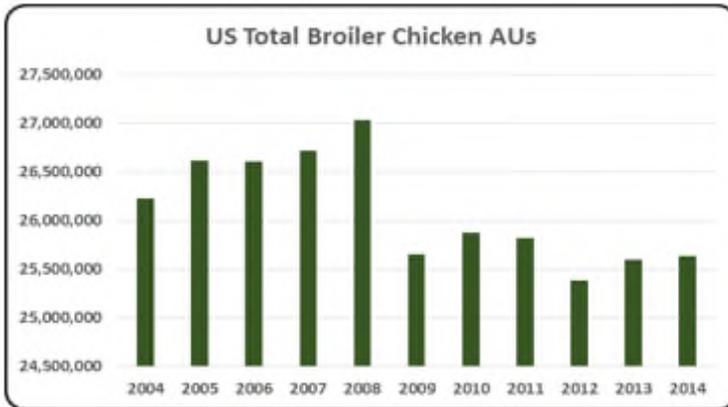
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In New Hampshire, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (42.1 thousand AUs), Dairy Cows (18.9 thousand AUs), and Beef Cows (11.7 thousand AUs). Total animal units in New Hampshire during 2014 were 76 thousand AUs.



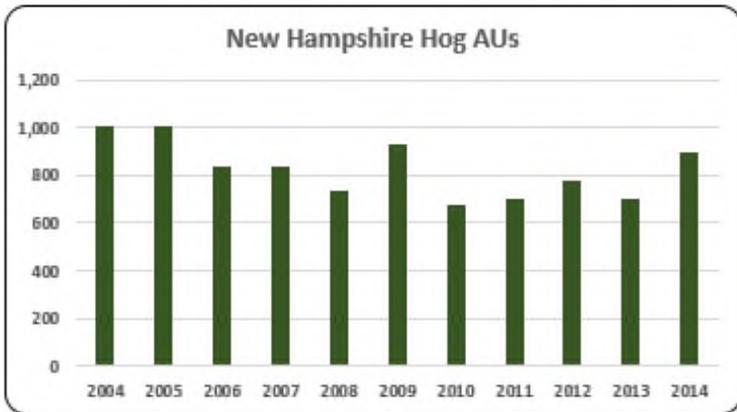
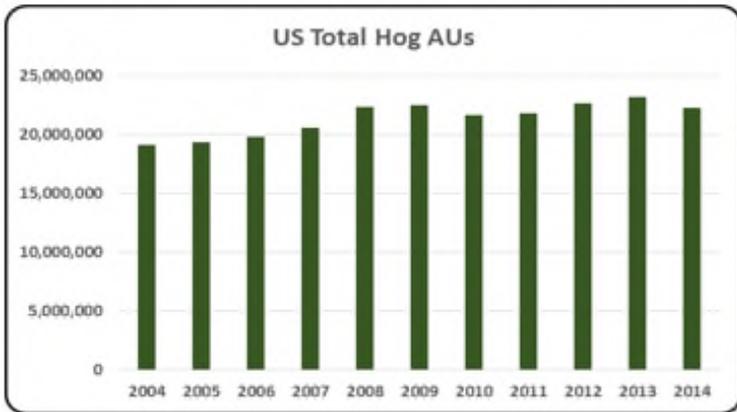
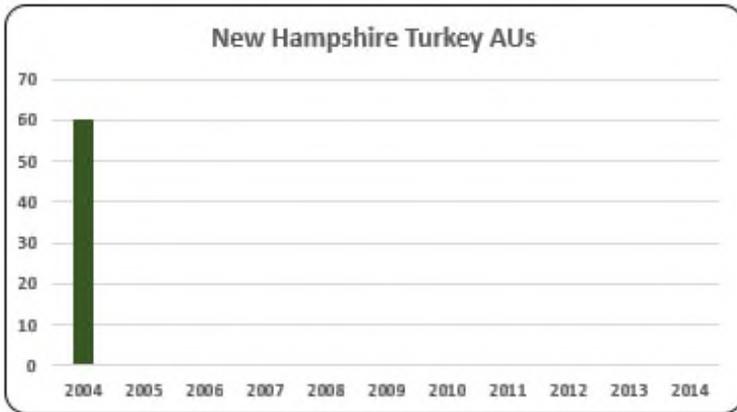
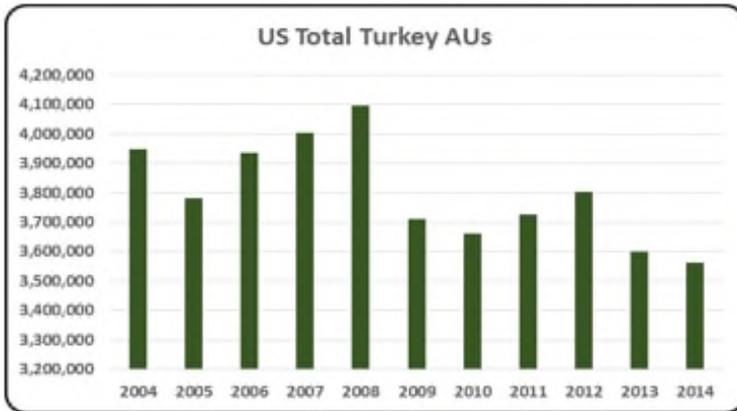
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- Animal production in New Hampshire is very small representing only 0.06% (75,979 AUs) of all animal production in the U.S. in 2014. New Hampshire AUs have increased 7% since 2004.



- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Fifty five percent (42,116) of all AUs in the state of New Hampshire were in broiler production in 2014. Broiler production rose 27.0% in 2014 compared to 2004.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- There were 2,393 layer AUs in 2014 in the state. 2007 was a record year with 2,539 layer AUs.

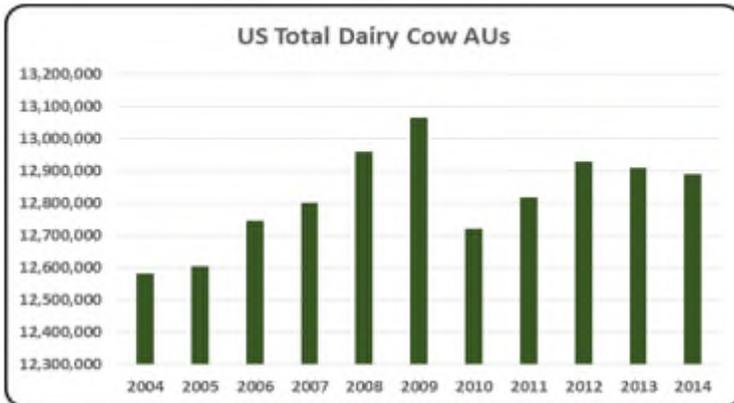


- From 2004 to 2014, the U.S. accounted for 50% of the world's turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

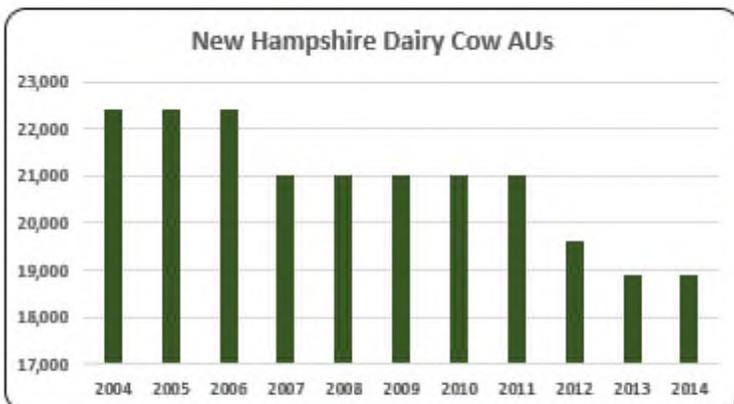
- Turkey production was non-existent in New Hampshire during the last decade.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

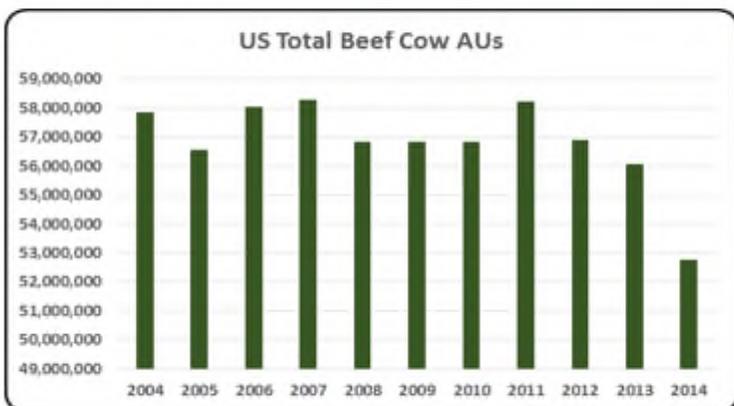
- Hog AUs represented 1.18% (900) of all animal production in the state of New Hampshire. Hog numbers dropped 10% since 2004



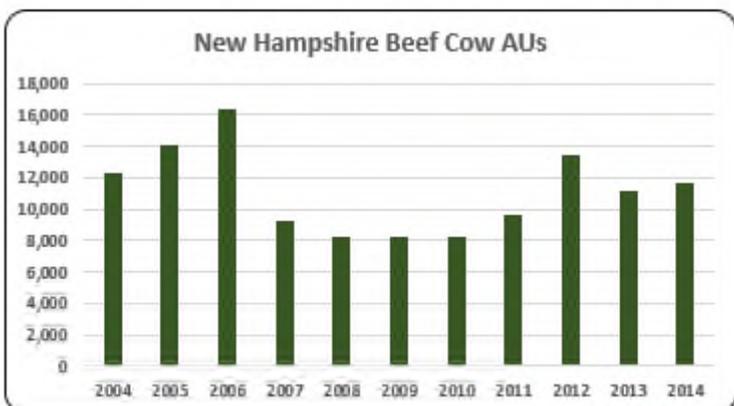
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Almost a quarter (18,900) of all AUs in New Hampshire were in dairy cow production in 2014. Dairy cow production has declined 16% since the beginning of the decade.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- 2006 was a record year for beef cow production in New Hampshire with 16,305 beef cow AUs. 2014 beef cow production was only 72% (11,670 beef cow AUs) of that record production.

New Hampshire Additional Information and Methodology

Animal agriculture is a small part of New Hampshire's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in New Hampshire, of interest is the degree to which the industry impacts the New Hampshire economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for New Hampshire animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted New Hampshire's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in New Hampshire which have occurred. As shown in this state report, New Hampshire has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in New Hampshire. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

New Hampshire Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on New Hampshire's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in New Hampshire, \$1.451 to \$1.582 million in total economic activity, \$0.236 to \$0.272 in household wages and 6 to 8 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.5188 | \$ 0.2360 | 7.1 |
| | Hogs, Pigs, and Other | \$ 1.4512 | \$ 0.2373 | 7.1 |
| | Poultry and Eggs | \$ 1.5349 | \$ 0.2461 | 6.5 |
| | Dairy | \$ 1.5822 | \$ 0.2717 | 8.4 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|------------------|------------------|------------------|-------------------|-------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| Animal Units (AUs) | Beef Cattle AUs | 12,315 | 14,115 | 16,305 | 9,240 | 8,175 | 8,175 | 8,175 | 9,660 | 13,455 | 11,130 | 11,670 |
| | Hog and Pig AUs | 1,005 | 1,005 | 840 | 840 | 735 | 930 | 675 | 705 | 780 | 705 | 900 |
| | Broiler AUs | 33,169 | 32,471 | 32,252 | 36,152 | 35,588 | 33,088 | 33,533 | 25,268 | 42,505 | 42,357 | 42,116 |
| | Turkey AUs | 60 | - | - | - | - | - | - | - | - | - | - |
| | Egg Layer AUs | 2,267 | 2,496 | 2,409 | 2,539 | 2,467 | 2,158 | 2,143 | 2,156 | 2,320 | 2,356 | 2,393 |
| | Dairy AUs | 22,400 | 22,400 | 22,400 | 21,000 | 21,000 | 21,000 | 21,000 | 21,000 | 19,600 | 18,900 | 18,900 |
| | Total Animal Units | 71,216 | 72,488 | 74,206 | 69,771 | 67,965 | 65,351 | 65,527 | 58,789 | 78,660 | 75,447 | 75,979 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 8,691 | \$ 8,892 | \$ 8,587 | \$ 8,017 | \$ 7,011 | \$ 6,928 | \$ 5,781 | \$ 8,974 | \$ 11,065 | \$ 10,063 | \$ 13,931 |
| | Hogs and Pigs (\$1,000) | \$ 429 | \$ 389 | \$ 279 | \$ 304 | \$ 242 | \$ 386 | \$ 262 | \$ 248 | \$ 815 | \$ 665 | \$ 945 |
| | Broilers (\$1,000) | \$ 27,898 | \$ 26,426 | \$ 20,422 | \$ 27,196 | \$ 27,989 | \$ 24,245 | \$ 25,519 | \$ 22,483 | \$ 42,342 | \$ 51,584 | \$ 54,113 |
| | Turkeys (\$1,000) | \$ 177 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Eggs (\$1,000) | \$ 3,333 | \$ 2,391 | \$ 2,381 | \$ 4,373 | \$ 14,354 | \$ 10,216 | \$ 11,215 | \$ 12,296 | \$ 13,790 | \$ 15,579 | \$ 18,091 |
| | Milk (\$1,000) | \$ 52,419 | \$ 49,226 | \$ 41,606 | \$ 60,900 | \$ 59,501 | \$ 41,020 | \$ 52,332 | \$ 62,062 | \$ 53,900 | \$ 58,480 | \$ 73,038 |
| | Other | \$ 1,091 | \$ 1,054 | \$ 1,017 | \$ 980 | \$ 943 | \$ 907 | \$ 870 | \$ 833 | \$ 796 | \$ 759 | \$ 722 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 1,091 | \$ 1,054 | \$ 1,017 | \$ 980 | \$ 943 | \$ 907 | \$ 870 | \$ 833 | \$ 796 | \$ 759 | \$ 722 |
| | Total (\$1,000) | \$ 94,038 | \$ 88,378 | \$ 74,292 | \$ 101,770 | \$ 110,041 | \$ 83,701 | \$ 95,978 | \$ 106,896 | \$ 122,708 | \$ 137,130 | \$ 160,840 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|---------------|---------------|---------------|---------------|-------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 324 | 242 | 328 | 383 | |
| | Cattle feedlots (112112) | 32 | 39 | 3 | 1 | |
| | Dairy cattle and milk production (11212) | 221 | 191 | 194 | 150 | |
| | Hog and pig farming (1122) | 58 | 64 | 62 | 88 | |
| | Poultry and egg production (1123) | 61 | 100 | 247 | 224 | |
| | Sheep and goat farming (1124) | 168 | 174 | 257 | 300 | |
| | Animal aquaculture and other animal production (1125,1129) | 330 | 749 | 864 | 1,003 | |
| Value of Sales (\$1,000) | Cattle and Calves | 5,116 | 5,140 | 6,743 | 9,477 | |
| | Hogs and Pigs | 1,441 | withheld | 518 | 846 | |
| | Poultry and Eggs | 19,311 | 6,251 | 15,390 | 13,488 | |
| | Milk and Other Dairy Products | 47,597 | withheld | 59,132 | 54,798 | |
| | Aquaculture | n/a | 3,340 | 3,734 | 3,376 | |
| | Other (calculated) | 4,200 | 46,955 | 7,067 | 4,124 | |
| | Total | 77,665 | 61,686 | 92,584 | 86,109 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 706 | 705 | 994 | 1,247 | |
| | | \$1,000 | 3,031 | 1,638 | 4,470 | 3,874 |
| | Breeding livestock purchased | (Farms) n/a | 227 | 360 | 526 | |
| | | \$1,000 | n/a | 522 | 1,786 | 1,842 |
| | Other livestock and poultry purchased | (Farms) n/a | 537 | 768 | 989 | |
| | | \$1,000 | n/a | 1,116 | 2,684 | 2,033 |
| Feed purchased | (Farms) 1,415 | 2,010 | 2,308 | 2,787 | | |
| | \$1,000 | 22,257 | 20,933 | 30,644 | 44,756 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|-------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 21,158 | \$ 3,288 | 99 | \$ 833 |
| | Hogs, Pigs, and Other | \$ 2,419 | \$ 396 | 12 | \$ 100 |
| | Poultry and Eggs | \$ 110,826 | \$ 17,769 | 468 | \$ 4,501 |
| | Dairy | \$ 115,561 | \$ 19,844 | 613 | \$ 5,027 |
| | Total | \$ 249,965 | \$ 41,297 | 1,191 | \$ 10,461 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 4,616 | \$ 717 | 22 | \$ 182 |
| | Hogs, Pigs, and Other | \$ (345) | \$ (56) | (2) | \$ (14) |
| | Poultry and Eggs | \$ 50,410 | \$ 8,082 | 213 | \$ 2,047 |
| | Dairy | \$ 11,621 | \$ 1,996 | 62 | \$ 505 |
| | Total | \$ 66,301 | \$ 10,739 | 294 | \$ 2,720 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 1.5188 | \$ 0.2360 | 7.1 | |
| | Hogs, Pigs, and Other | \$ 1.4512 | \$ 0.2373 | 7.1 | |
| | Poultry and Eggs | \$ 1.5349 | \$ 0.2461 | 6.5 | |
| | Dairy | \$ 1.5822 | \$ 0.2717 | 8.4 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 5.0% | |
| | Total | | | 25.3% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: NEW JERSEY

New Jersey Executive Summary

The use of soybean meal as a key feed ingredient is a small part of New Jersey's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in New Jersey. In the state of New Jersey during 2014 animal agriculture contributed:

- \$181.7 million in economic output
- 1,012 jobs
- \$30.9 million in earnings
- \$8.0 million in income taxes paid at local, state, and federal levels
- \$55.3 million in the form of property taxes

New Jersey's animal agriculture consumed about 16,500 tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Companion Animals (6,500 tons)
- Turkeys (3,800 tons)
- Egg-Laying Hens (2,300 tons)

This report examines animal agriculture in New Jersey over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in New Jersey, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of New Jersey.

New Jersey Economic Impact of Animal Agriculture

Animal agriculture is a small part of New Jersey's economy. In 2014, New Jersey's animal agriculture contributed the following to the economy:

- About \$181.7 million in economic output
- \$30.9 million in household earnings
- 1,012 jobs
- \$8.0 million in income taxes

During the last decade contractions New Jersey's animal agriculture has:

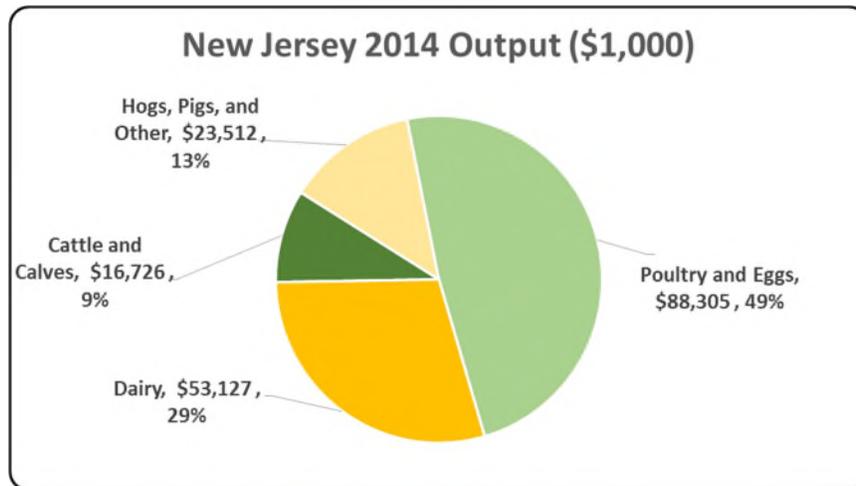
- Decreased economic output by \$81.8 million
- Reduced household earnings by \$13.9 million
- Shrunk by 397 jobs
- Paid \$3.6 million less in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|------------|------------------|--------------------|
| Output (\$1,000) | \$ 181,669 | \$ (81,827) | -31.05% |
| Earnings (\$1,000) | \$ 30,903 | \$ (13,865) | -30.97% |
| Employment (Jobs) | 1,012 | (397) | -28.20% |
| Income Taxes Paid (\$1,000) | \$ 8,004 | \$ (3,591) | -30.97% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 55,277 | | |

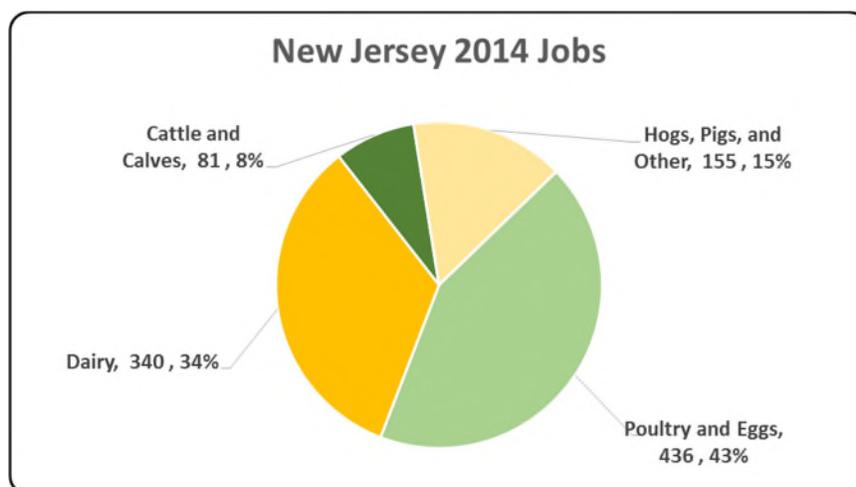
New Jersey Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the New Jersey economy. Animal agriculture’s impact on New Jersey total economic output is about \$181.7 million.



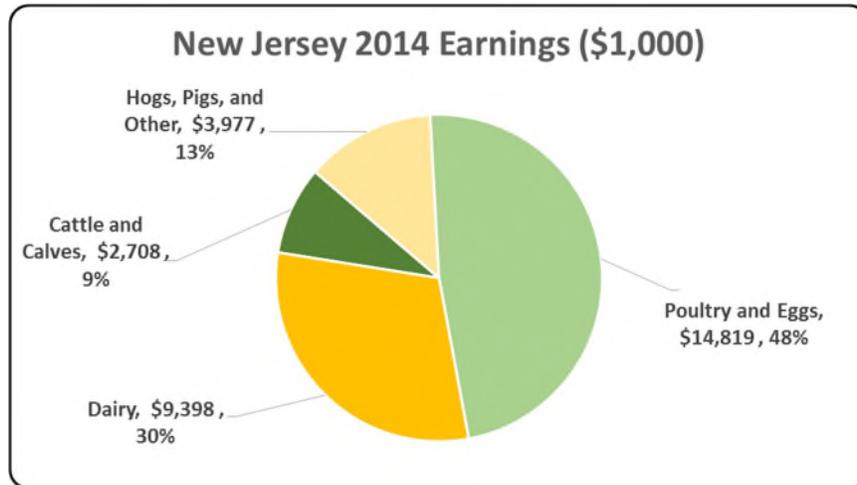
New Jersey Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to New Jersey in terms of animal agriculture jobs. As shown, animal agriculture contributes about 1,012 jobs within and outside of animal agriculture.



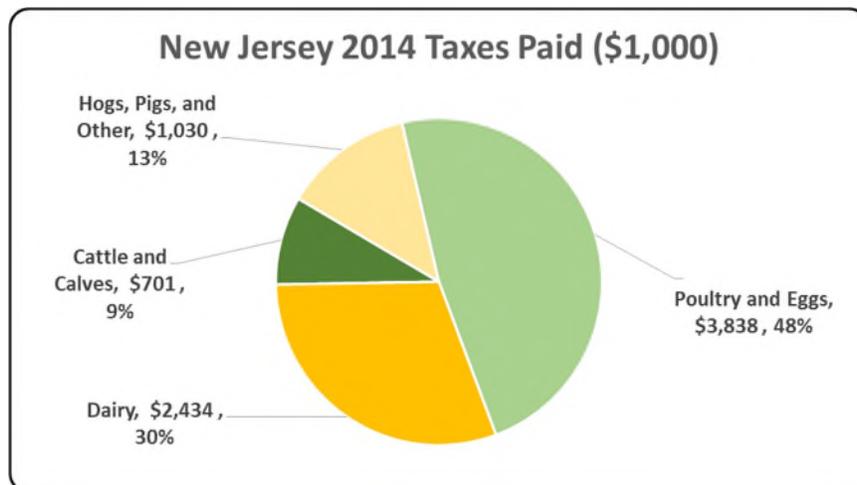
New Jersey Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the New Jersey economy in terms of earnings. New Jersey’s animal agriculture contributed about \$30.9 million to household earnings in 2014.



New Jersey Taxes Paid by Animal Agriculture

New Jersey’s animal agriculture is a small source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$8.0 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$55.3 million in property taxes paid by all of New Jersey agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



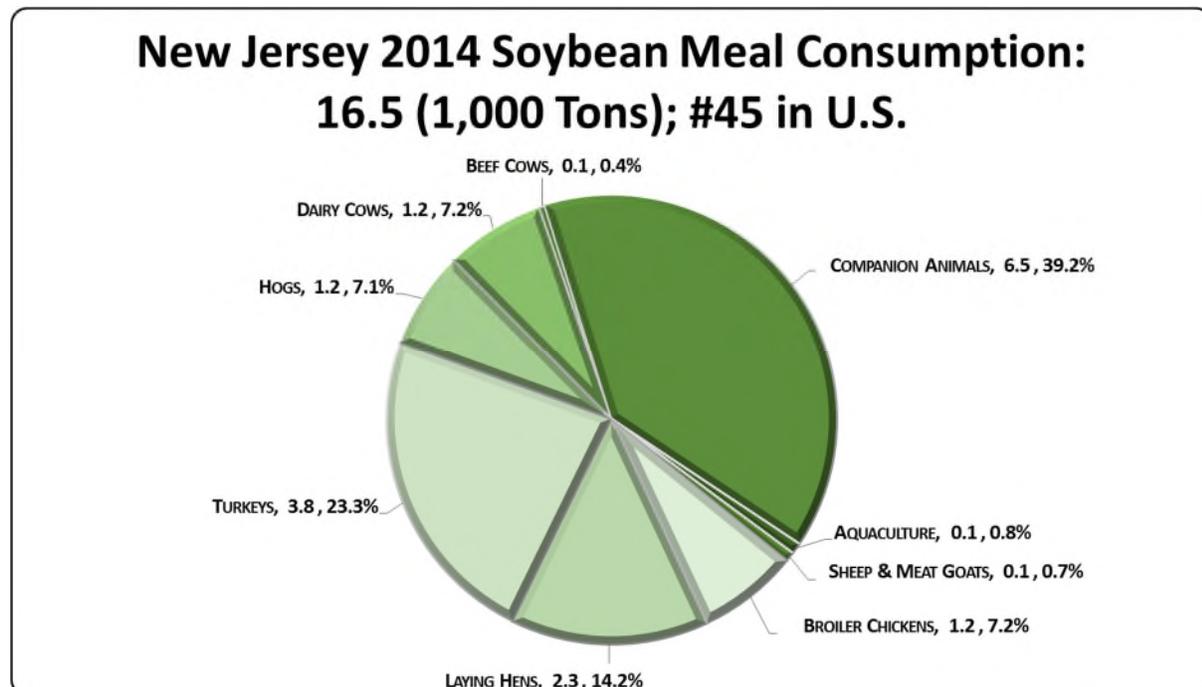
New Jersey Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

New Jersey's animal agriculture consumed almost 16,500 tons of soybean meal in 2014, placing the state as #45 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Companion Animals (6,500 tons)
- Turkeys (3,800 tons)
- Egg-Laying Hens (2,300 tons)



New Jersey Animal Unit (AU) Trends

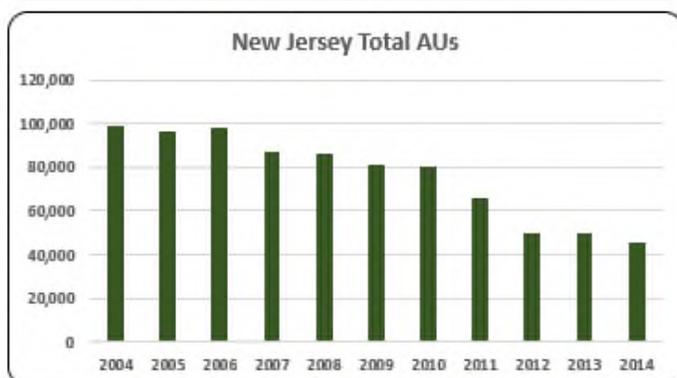
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of New Jersey. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to New Jersey and to give perspective on New Jersey's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

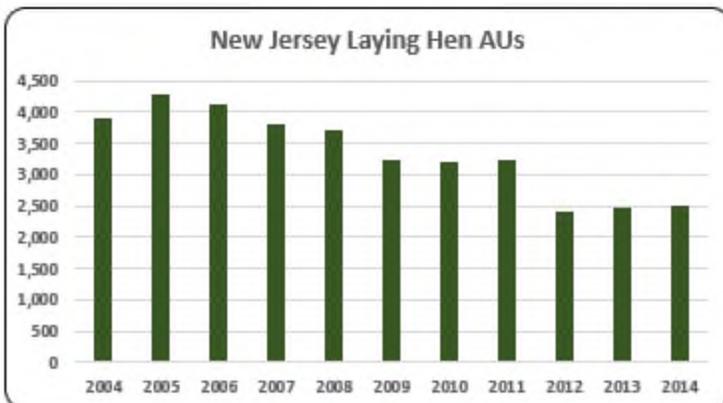
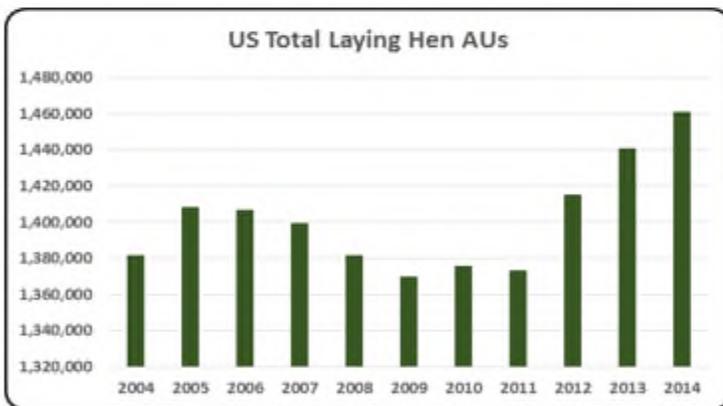
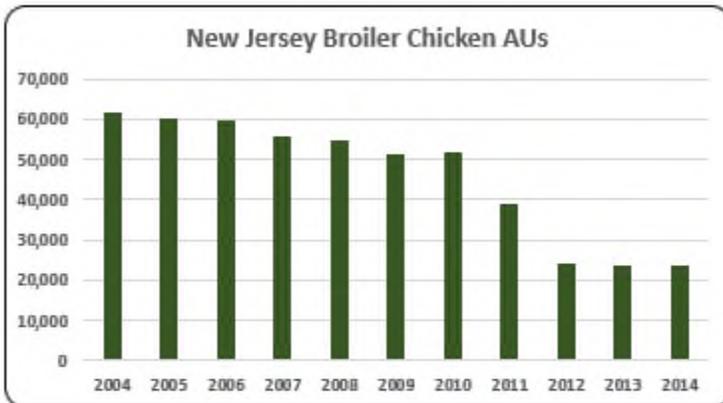
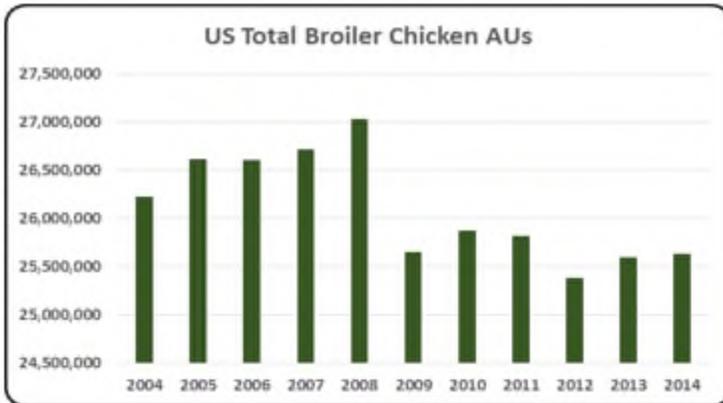
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In New Jersey, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (23.7 thousand AUs), Dairy Cows (9.8 thousand AUs), and Beef Cows (6.5 thousand AUs). Total animal units in New Jersey during 2014 were 45.9 thousand AUs.



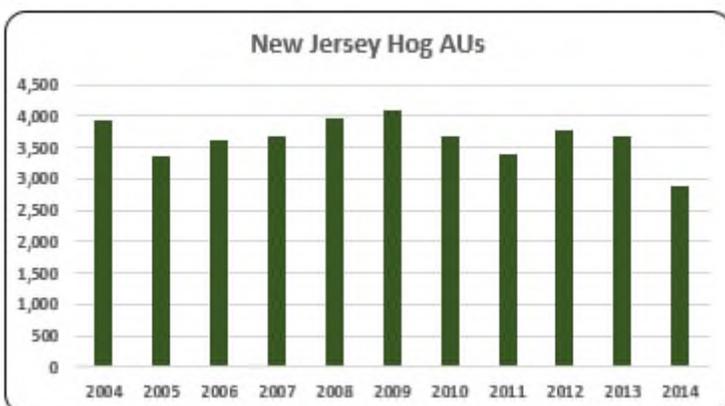
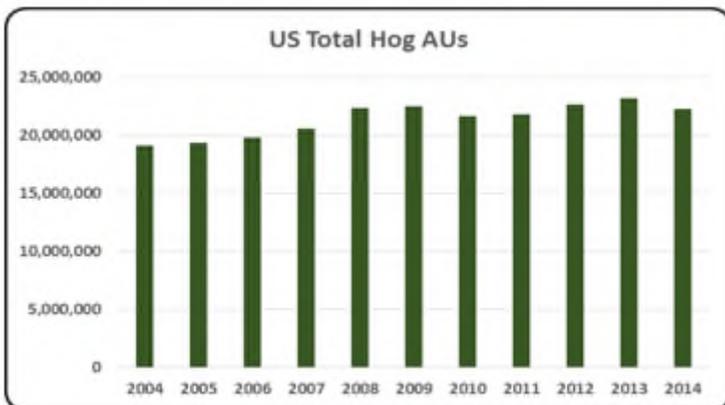
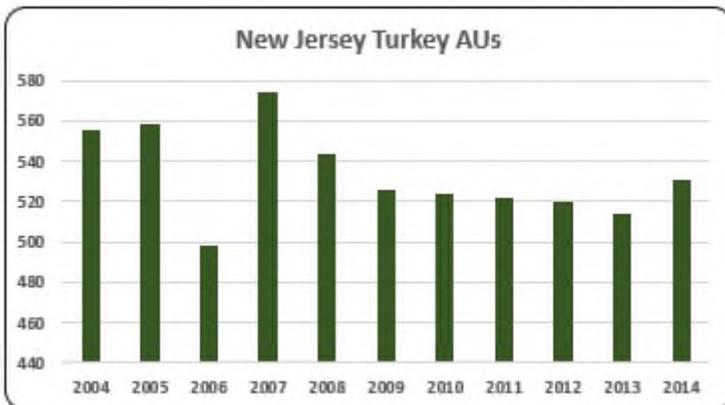
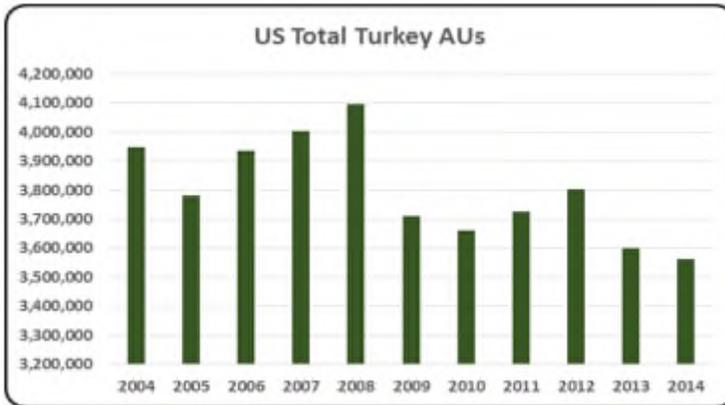
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



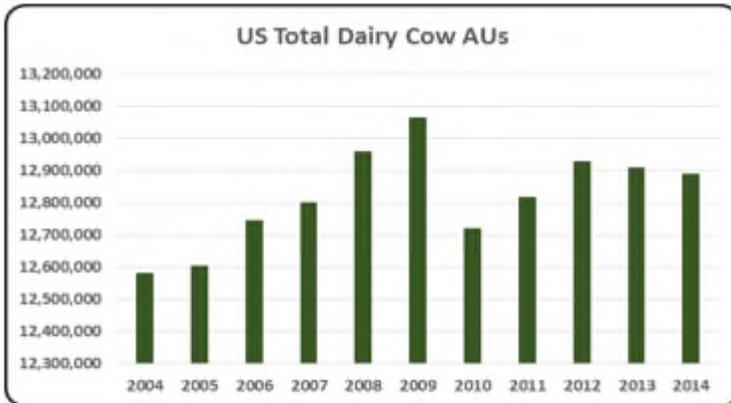
- Only 0.04% (45,882) of all AUs in 2014 were in New Jersey and animal production declined 54% throughout the decade.



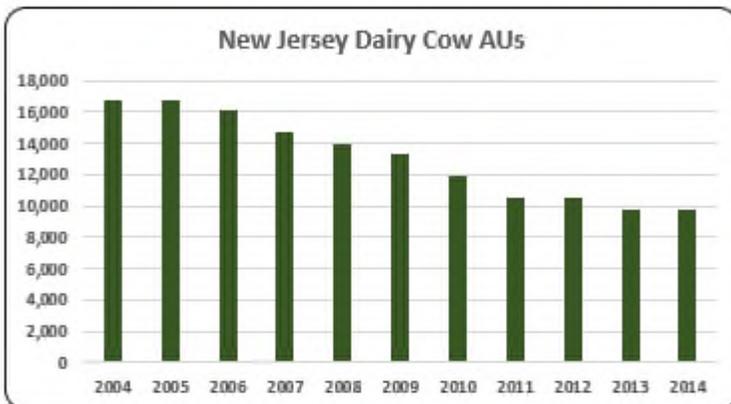
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- About 51.6% (23,679) of animal production in New Jersey in 2014 was broiler production. Broiler production substantially decreased (61.5%) during 2004 to 2014.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layer production followed the same downward trend as broiler production during last decade from 3,885 layer AUs in 2004 to 2,497 layer AUs in 2014 for a 36% decline in the layer industry in New Jersey.



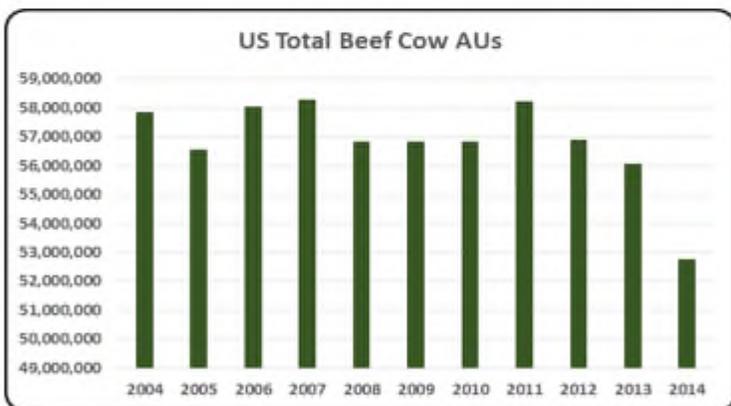
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- With only 531 turkey AUs in 2014 and an average of 533 turkey AUs from 2004 to 2014 turkey production is the smallest animal production in New Jersey.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production in 2014 (2,880 hog AUs) represented about 6.3% of all animal production in the state. Hog production in 2014 decreased 27% compared to the record high level in 2004 (3,945 hog AUs).



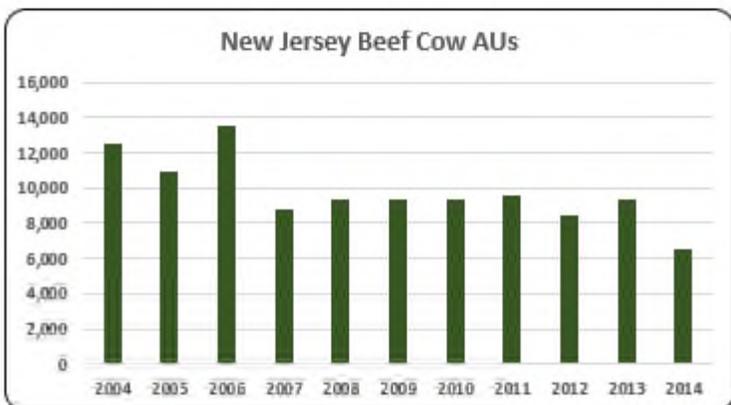
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production in New Jersey consistently decreased from 2004 to 2014, from 16,800 dairy cow AUs in 2004 to 9,800 dairy cow AUs in 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Although beef cow production is the third largest animal production in New Jersey, production declined 48% since 2004. Beef cow AUs were 6,495 in 2014.

New Jersey Additional Information and Methodology

Animal agriculture is a small part of New Jersey's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in New Jersey, of interest is the degree to which the industry impacts the New Jersey economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for New Jersey animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted New Jersey's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in New Jersey which have occurred. As shown in this state report, New Jersey has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in New Jersey. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

New Jersey Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on New Jersey's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in New Jersey, \$1.531 to \$1.708 million in total economic activity, \$0.259 to \$0.297 in household wages and 8 to 11 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.5990 | \$ 0.2589 | 7.8 |
| | Hogs, Pigs, and Other | \$ 1.5305 | \$ 0.2589 | 10.1 |
| | Poultry and Eggs | \$ 1.7084 | \$ 0.2867 | 8.4 |
| | Dairy | \$ 1.6800 | \$ 0.2972 | 10.8 |

Appendix

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|-----------------------------|-------------------|-------------------|------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|------------------|-------------------|
| Animal Units (AUs) | Beef Cattle AUs | 12,525 | 10,950 | 13,470 | 8,730 | 9,300 | 9,300 | 9,300 | 9,570 | 8,460 | 9,405 | 6,495 |
| | Hog and Pig AUs | 3,945 | 3,360 | 3,615 | 3,675 | 3,960 | 4,095 | 3,675 | 3,405 | 3,765 | 3,675 | 2,880 |
| | Broiler AUs | 61,543 | 60,248 | 59,841 | 55,752 | 54,882 | 51,028 | 51,714 | 38,967 | 23,898 | 23,814 | 23,679 |
| | Turkey AUs | 555 | 558 | 498 | 574 | 543 | 526 | 524 | 521 | 520 | 514 | 531 |
| | Egg Layer AUs | 3,885 | 4,278 | 4,129 | 3,806 | 3,697 | 3,234 | 3,213 | 3,231 | 2,421 | 2,458 | 2,497 |
| | Dairy AUs | 16,800 | 16,800 | 16,100 | 14,700 | 14,000 | 13,300 | 11,900 | 10,500 | 10,500 | 9,800 | 9,800 |
| | Total Animal Units | 99,253 | 96,194 | 97,652 | 87,237 | 86,383 | 81,483 | 80,325 | 66,195 | 49,563 | 49,667 | 45,882 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 7,334 | \$ 8,201 | \$ 7,923 | \$ 6,116 | \$ 5,717 | \$ 5,014 | \$ 5,178 | \$ 7,859 | \$ 8,734 | \$ 7,340 | \$ 10,460 |
| | Hogs and Pigs (\$1,000) | \$ 417 | \$ 227 | \$ 412 | \$ 415 | \$ 376 | \$ 426 | \$ 554 | \$ 716 | \$ 581 | \$ 372 | \$ 262 |
| | Broilers (\$1,000) | \$ 51,763 | \$ 49,032 | \$ 37,891 | \$ 41,941 | \$ 43,164 | \$ 37,389 | \$ 39,354 | \$ 34,673 | \$ 23,806 | \$ 29,002 | \$ 30,424 |
| | Turkeys (\$1,000) | \$ 708 | \$ 678 | \$ 842 | \$ 1,248 | \$ 2,781 | \$ 1,493 | \$ 1,672 | \$ 1,850 | \$ 2,029 | \$ 2,207 | \$ 2,385 |
| | Eggs (\$1,000) | \$ 28,912 | \$ 20,206 | \$ 20,267 | \$ 33,373 | \$ 14,979 | \$ 10,661 | \$ 11,703 | \$ 12,831 | \$ 14,390 | \$ 16,258 | \$ 18,879 |
| | Milk (\$1,000) | \$ 32,800 | \$ 29,760 | \$ 23,852 | \$ 32,928 | \$ 31,265 | \$ 20,224 | \$ 23,520 | \$ 28,215 | \$ 24,570 | \$ 26,162 | \$ 31,623 |
| | Other | \$ 2,449 | \$ 3,714 | \$ 4,979 | \$ 6,244 | \$ 7,509 | \$ 8,775 | \$ 10,040 | \$ 11,305 | \$ 12,570 | \$ 13,835 | \$ 15,100 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 2,449 | \$ 3,714 | \$ 4,979 | \$ 6,244 | \$ 7,509 | \$ 8,775 | \$ 10,040 | \$ 11,305 | \$ 12,570 | \$ 13,835 | \$ 15,100 |
| | Total (\$1,000) | \$ 124,383 | \$ 111,818 | \$ 96,166 | \$ 122,265 | \$ 105,792 | \$ 83,982 | \$ 92,020 | \$ 97,449 | \$ 86,680 | \$ 95,176 | \$ 109,134 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|----------|--------|--------|---------|--------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 620 | 657 | 704 | 701 | |
| | Cattle feedlots (112112) | 202 | 214 | 75 | 9 | |
| | Dairy cattle and milk production (11212) | 207 | 129 | 123 | 76 | |
| | Hog and pig farming (1122) | 118 | 133 | 95 | 60 | |
| | Poultry and egg production (1123) | 188 | 283 | 405 | 455 | |
| | Sheep and goat farming (1124) | 318 | 503 | 669 | 630 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,180 | 1,831 | 1,962 | 1,611 | |
| Value of Sales (\$1,000) | Cattle and Calves | 9,194 | 7,094 | 9,559 | 8,829 | |
| | Hogs and Pigs | 4,475 | 2,313 | 2,349 | 1,682 | |
| | Poultry and Eggs | 35,856 | 26,041 | 33,044 | 40,081 | |
| | Milk and Other Dairy Products | 37,891 | 29,154 | 34,091 | 26,119 | |
| | Aquaculture | n/a | 2,223 | 6,637 | 12,396 | |
| | Other (calculated) | withheld | 25,553 | 49,553 | 10,048 | |
| | Total | | 87,416 | 92,378 | 135,233 | 99,155 |
| Input Purchases | Livestock and poultry purchased | (Farms) | 1,671 | 1,819 | 1,768 | 1,876 |
| | | \$1,000 | 10,339 | 8,265 | 11,977 | 14,758 |
| | Breeding livestock purchased | (Farms) | n/a | 562 | 572 | 621 |
| | | \$1,000 | n/a | 1,971 | 4,681 | 4,087 |
| | Other livestock and poultry purchased | (Farms) | n/a | 1,397 | 1,380 | 1,473 |
| | | \$1,000 | n/a | 6,294 | 7,296 | 10,671 |
| | Feed purchased | (Farms) | 3,290 | 4,654 | 4,669 | 4,683 |
| | | \$1,000 | 38,309 | 31,277 | 41,361 | 54,047 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|--------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 16,726 | \$ 2,708 | 81 | \$ 701 |
| | Hogs, Pigs, and Other | \$ 23,512 | \$ 3,977 | 155 | \$ 1,030 |
| | Poultry and Eggs | \$ 88,305 | \$ 14,819 | 436 | \$ 3,838 |
| | Dairy | \$ 53,127 | \$ 9,398 | 340 | \$ 2,434 |
| | Total | \$ 181,669 | \$ 30,903 | 1,012 | \$ 8,004 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 2,029 | \$ 328 | 10 | \$ 85 |
| | Hogs, Pigs, and Other | \$ 18,015 | \$ 3,047 | 119 | \$ 789 |
| | Poultry and Eggs | \$ (85,939) | \$ (14,422) | (424) | \$ (3,735) |
| | Dairy | \$ (15,932) | \$ (2,818) | (102) | \$ (730) |
| | Total | \$ (81,827) | \$ (13,865) | (397) | \$ (3,591) |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.5990 | \$ 0.2589 | 7.8 | |
| | Hogs, Pigs, and Other | \$ 1.5305 | \$ 0.2589 | 10.1 | |
| | Poultry and Eggs | \$ 1.7084 | \$ 0.2867 | 8.4 | |
| | Dairy | \$ 1.6800 | \$ 0.2972 | 10.8 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 5.5% |
| | Total | | | | 25.9% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: NEW MEXICO

New Mexico Executive Summary

The use of soybean meal as a key feed ingredient is a small part of New Mexico's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in New Mexico. The success of New Mexico animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of New Mexico during 2014 animal agriculture contributed:

- \$5.7 billion in economic output
- 27,992 jobs
- \$979.7 million in earnings
- \$247.2 million in income taxes paid at local, state, and federal levels
- \$36.2 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in New Mexico increased economic output by over \$1.7 billion, boosted household earnings by \$284.7 million, contributed 8,144 additional jobs and paid \$71.8 million in additional tax revenues.

New Mexico's animal agriculture consumed about 61.0 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (41.3 thousand tons)
- Beef Cows (9.0 thousand tons)
- Companion Animals (4.4 thousand tons)

This report examines animal agriculture in New Mexico over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in New Mexico, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of New Mexico and beyond.

New Mexico Economic Impact of Animal Agriculture

Animal agriculture is an integral part of New Mexico's economy. In 2014, New Mexico's animal agriculture contributed the following to the economy:

- About \$5.7 billion in economic output
- \$979.7 million in household earnings
- 27,992 jobs
- \$247.2 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade New Mexico's animal agriculture has:

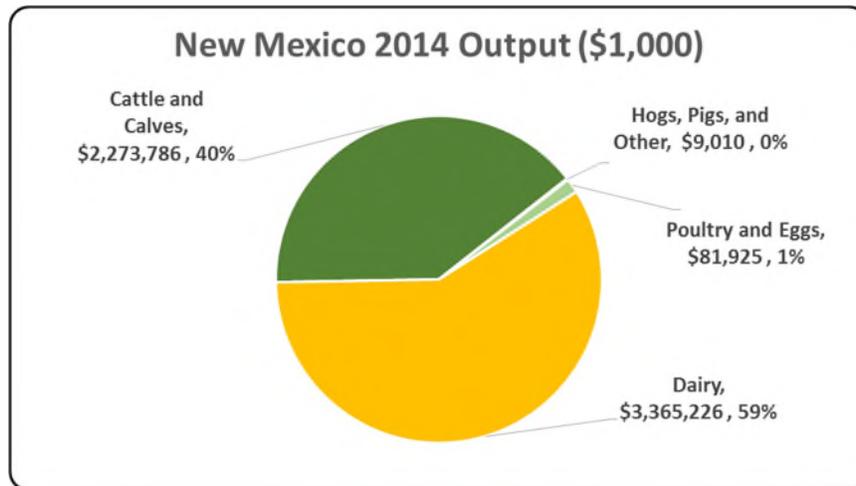
- Increased economic output by \$1.7 billion
- Boosted household earnings by \$284.7 million
- Added 8,144 jobs
- Paid an additional \$71.8 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 5,729,947 | \$ 1,664,590 | 40.95% |
| Earnings (\$1,000) | \$ 979,683 | \$ 284,693 | 40.96% |
| Employment (Jobs) | 27,992 | 8,144 | 41.03% |
| Income Taxes Paid (\$1,000) | \$ 247,174 | \$ 71,828 | 40.96% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 36,159 | | |

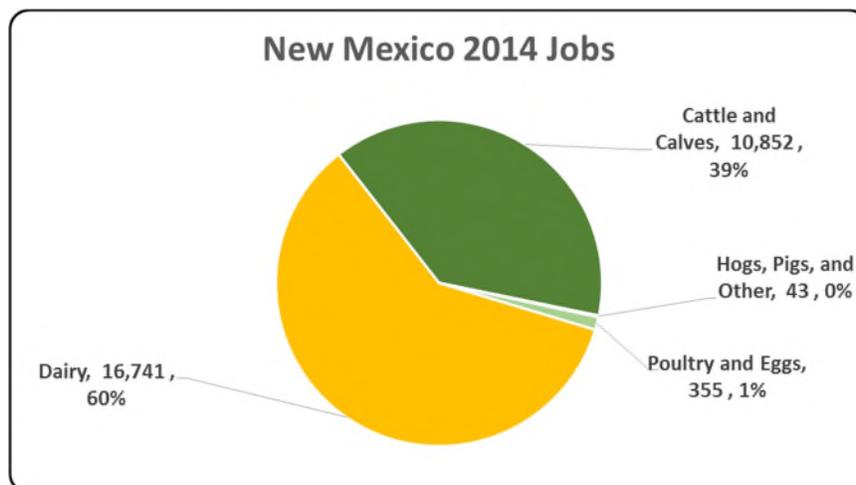
New Mexico Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the New Mexico economy. Animal agriculture’s impact on New Mexico total economic output is about \$5.7 billion.



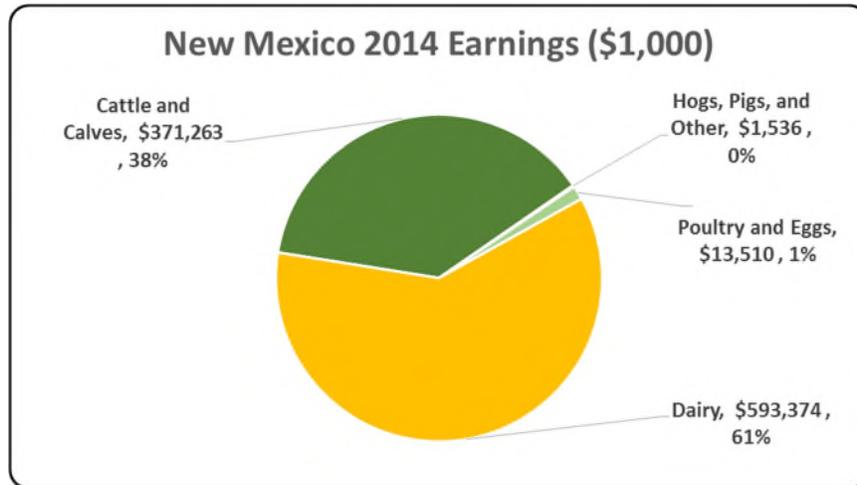
New Mexico Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to New Mexico in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to New Mexico total jobs, contributing 27,992 jobs within and outside of animal agriculture.



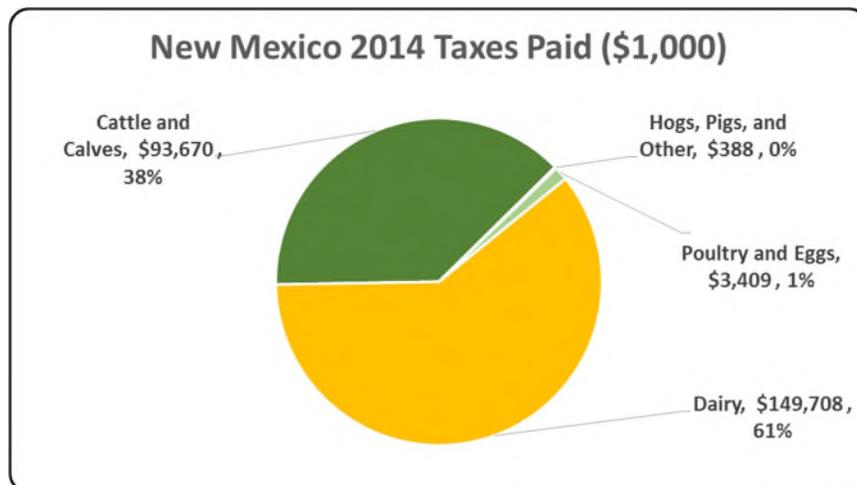
New Mexico Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the New Mexico economy in terms of earnings. New Mexico’s animal agriculture contributed about \$979.7 million to household earnings in 2014.



New Mexico Taxes Paid by Animal Agriculture

New Mexico’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$247.2 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$36.2 million in property taxes paid by all of New Mexico agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



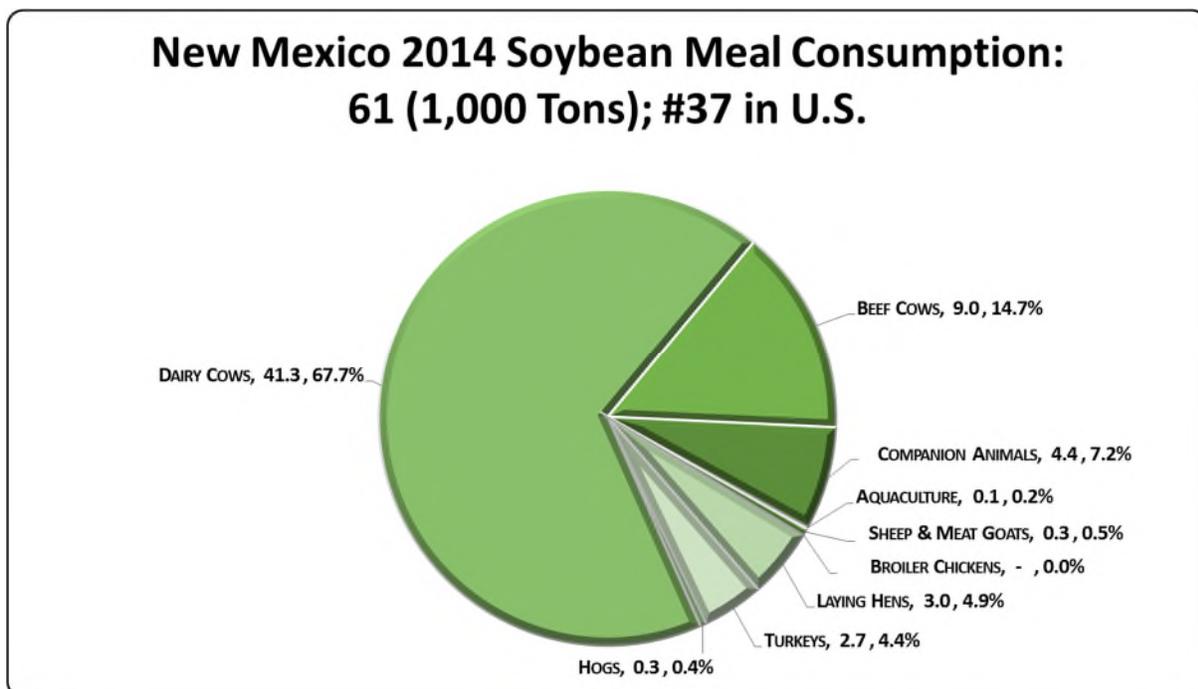
New Mexico Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

New Mexico's animal agriculture consumed almost 61.0 thousand tons of soybean meal in 2014, placing the state as #37 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (41.3 thousand tons)
- Beef Cows (9.0 thousand tons)
- Companion Animals (4.4 thousand tons)

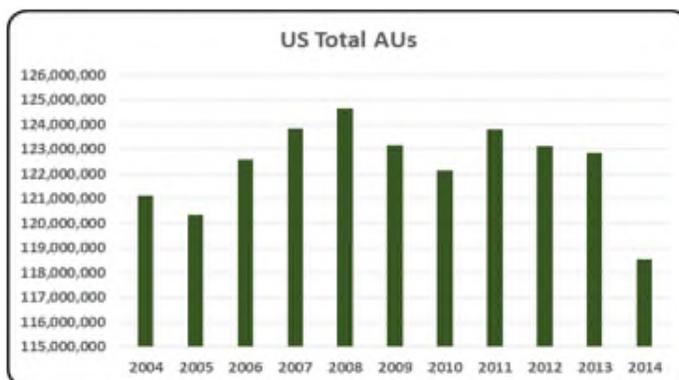


New Mexico Animal Unit (AU) Trends

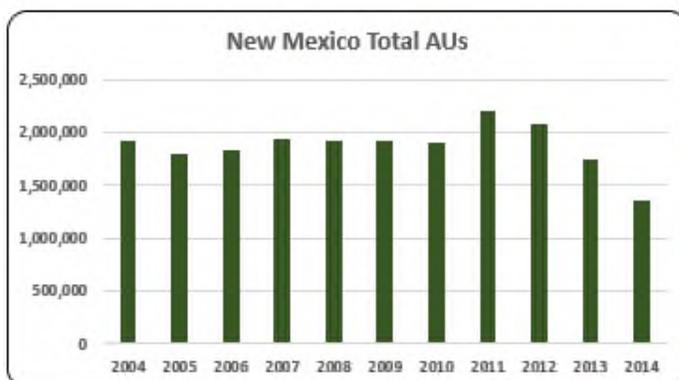
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of New Mexico. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to New Mexico and to give perspective on New Mexico's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

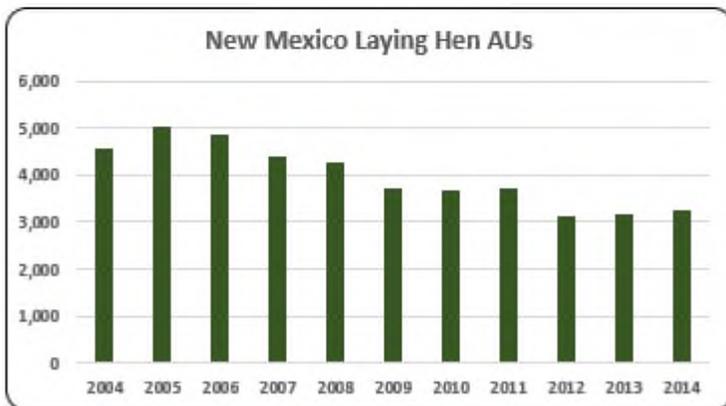
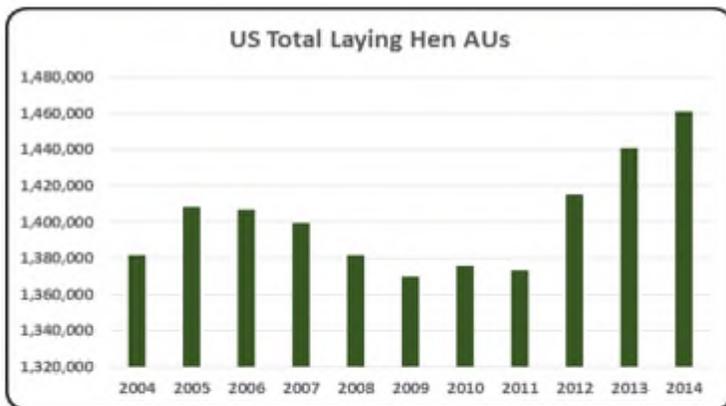
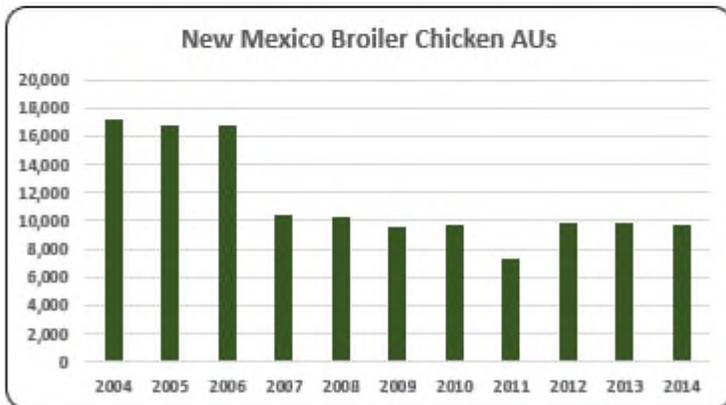
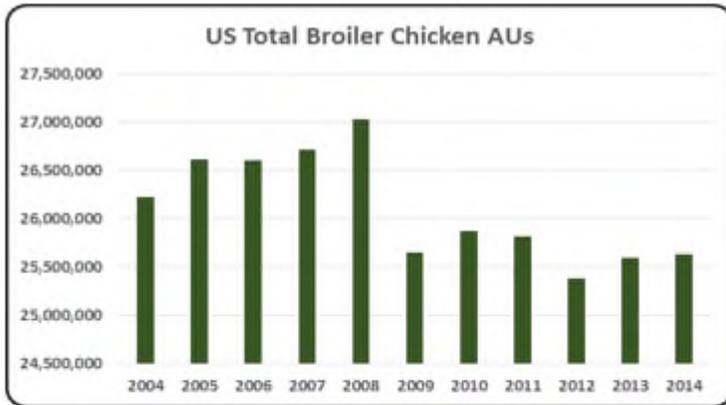
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In New Mexico, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (877.4 thousand AUs), Dairy Cows (452.2 thousand AUs), and Broilers (9.8 thousand AUs). Total animal units in New Mexico during 2014 were 1,347.8 thousand AUs.



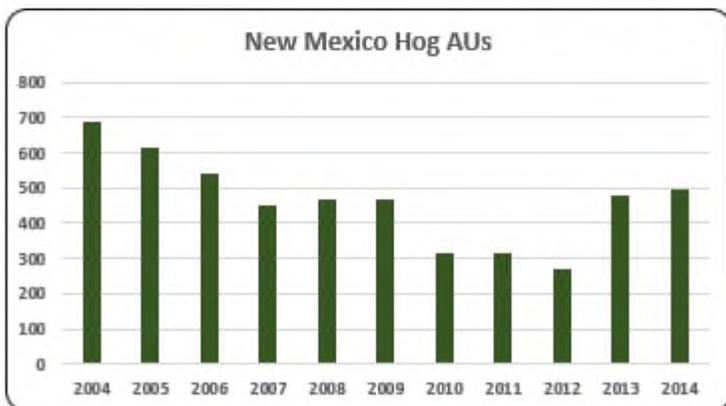
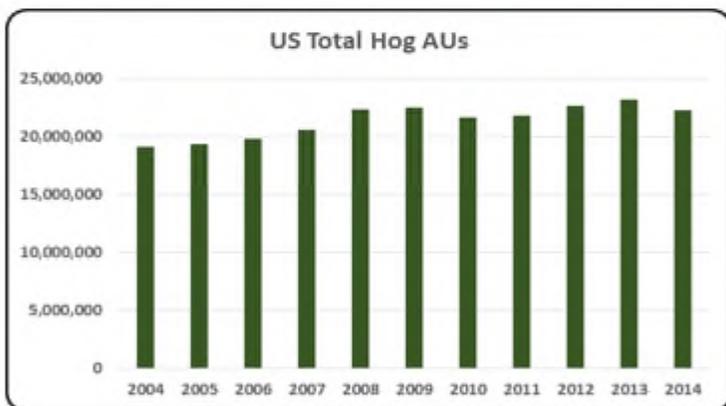
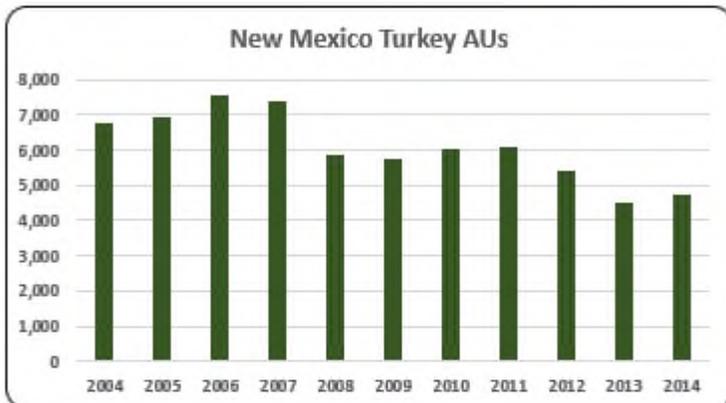
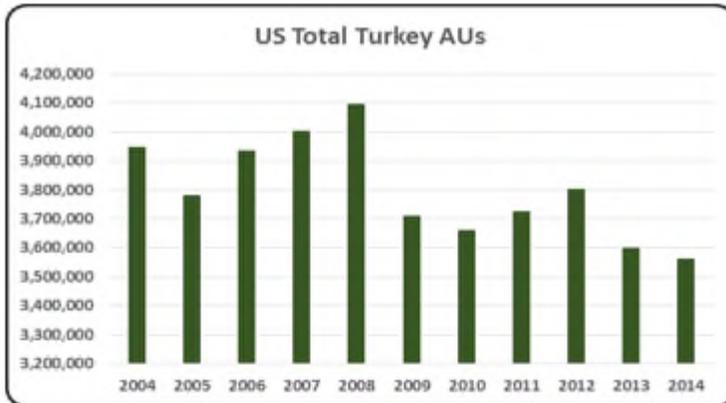
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



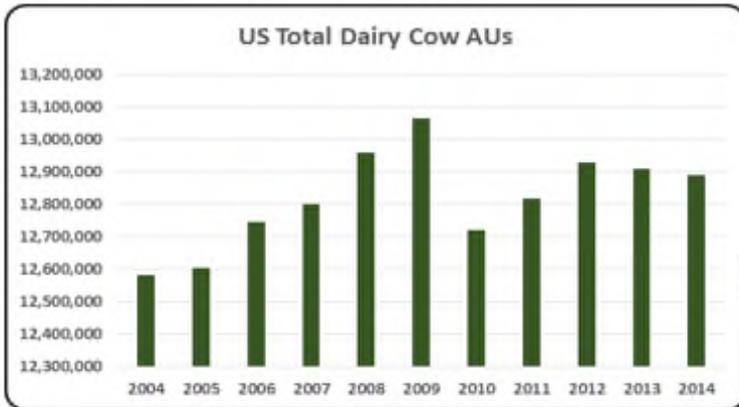
- 2011 was a record year for animal production in New Mexico with 2,193.54 thousand AUs. 2014 was a record low animal production with 1,347.8 thousand decreasing 22% year-over-year.



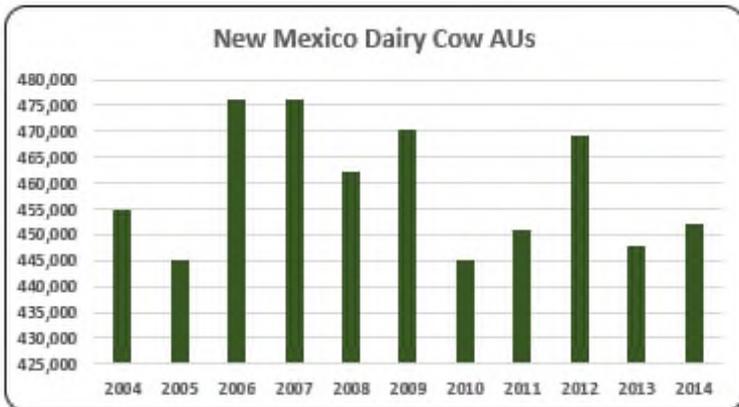
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production represented 0.7% (9,761 broiler AUs) of all AUs in the state in 2014. Broiler production has declined 43.2% from the beginning of the decade.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Less than a 0.24% (3,232 layer AUs) of animal production was layer production in 2014. The decline in layer production from 2004 to 2014 was about 30%.



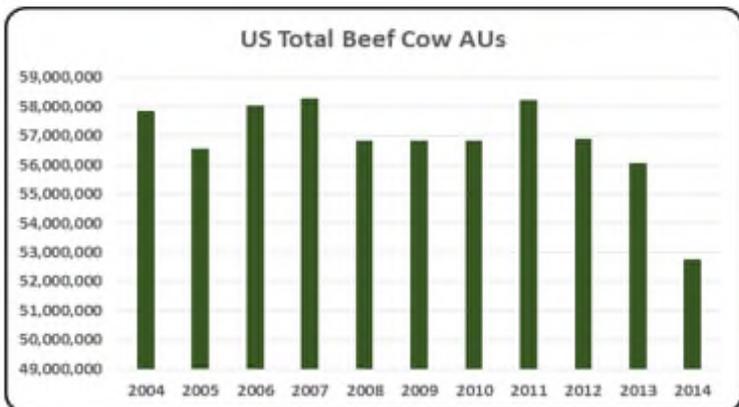
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production sunk 30% during the decade to 4,722 turkey AUs in 2014.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production is the smallest animal enterprise in New Mexico with only 495 AUs in 2014.



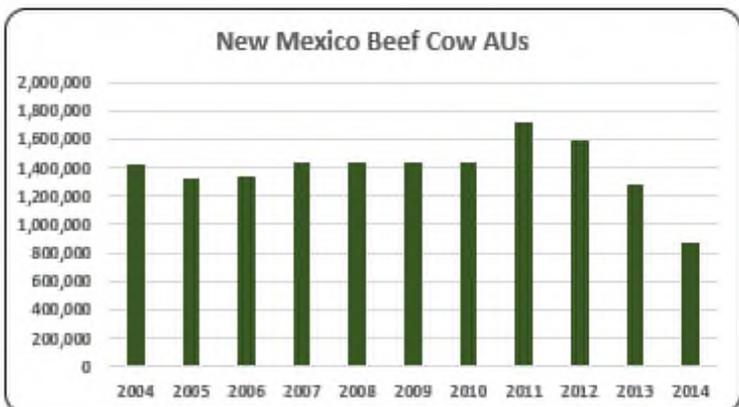
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy Cow production is the second largest animal production in New Mexico with an average of 459,073 throughout the decade.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- 2014 was a record low beef cow production with 877,425 beef cow AUs. 2011 had a record high beef cow production with 1,725.2 thousand AUs.

New Mexico Additional Information and Methodology

Animal agriculture is an important part of New Mexico's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in New Mexico, of interest is the degree to which the industry impacts the New Mexico economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for New Mexico animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted New Mexico's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in New Mexico which have occurred. As shown in this state report, New Mexico has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in New Mexico. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

New Mexico Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on New Mexico's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in New Mexico, \$1.651 to \$2.593 million in total economic activity, \$0.282 to \$0.423 in household wages and 8 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.5931 | \$ 0.4234 | 12.4 |
| | Hogs, Pigs, and Other | \$ 1.6510 | \$ 0.2815 | 7.9 |
| | Poultry and Eggs | \$ 1.7949 | \$ 0.2960 | 7.8 |
| | Dairy | \$ 1.8619 | \$ 0.3283 | 9.3 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,429,200 | 1,329,900 | 1,332,300 | 1,431,900 | 1,437,000 | 1,437,000 | 1,437,000 | 1,725,150 | 1,597,050 | 1,275,450 | 877,425 |
| | Hog and Pig AUs | 690 | 615 | 540 | 450 | 465 | 465 | 315 | 315 | 270 | 480 | 495 |
| | Broiler AUs | 17,184 | 16,822 | 16,709 | 10,453 | 10,290 | 9,568 | 9,696 | 7,306 | 9,851 | 9,817 | 9,761 |
| | Turkey AUs | 6,771 | 6,944 | 7,545 | 7,363 | 5,886 | 5,765 | 6,005 | 6,112 | 5,420 | 4,521 | 4,722 |
| | Egg Layer AUs | 4,582 | 5,046 | 4,869 | 4,374 | 4,249 | 3,717 | 3,692 | 3,714 | 3,133 | 3,182 | 3,232 |
| | Dairy AUs | 455,000 | 445,200 | 476,000 | 476,000 | 462,000 | 470,400 | 445,200 | 450,800 | 469,000 | 448,000 | 452,200 |
| | Total Animal Units | 1,913,427 | 1,804,528 | 1,837,964 | 1,930,541 | 1,919,890 | 1,926,914 | 1,901,908 | 2,193,397 | 2,084,724 | 1,741,449 | 1,347,835 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 491,627 | \$ 544,291 | \$ 502,289 | \$ 513,195 | \$ 587,945 | \$ 539,497 | \$ 659,946 | \$ 893,864 | \$ 993,045 | \$ 723,204 | \$ 876,860 |
| | Hogs and Pigs (\$1,000) | \$ 608 | \$ 521 | \$ 316 | \$ 272 | \$ 300 | \$ 267 | \$ 264 | \$ 252 | \$ 181 | \$ 472 | \$ 579 |
| | Broilers (\$1,000) | \$ 14,453 | \$ 13,691 | \$ 10,580 | \$ 7,864 | \$ 8,093 | \$ 7,011 | \$ 7,379 | \$ 6,501 | \$ 9,813 | \$ 11,955 | \$ 12,541 |
| | Turkeys (\$1,000) | \$ 6,282 | \$ 6,661 | \$ 7,873 | \$ 8,492 | \$ 7,949 | \$ 5,331 | \$ 7,142 | \$ 8,011 | \$ 7,861 | \$ 5,176 | \$ 8,667 |
| | Eggs (\$1,000) | \$ 14,603 | \$ 8,840 | \$ 9,800 | \$ 16,087 | \$ 19,387 | \$ 13,798 | \$ 15,147 | \$ 16,608 | \$ 18,625 | \$ 21,042 | \$ 24,435 |
| | Milk (\$1,000) | \$ 1,017,287 | \$ 993,993 | \$ 923,230 | \$ 1,370,520 | \$ 1,376,375 | \$ 956,384 | \$ 1,245,198 | \$ 1,586,338 | \$ 1,417,926 | \$ 1,514,716 | \$ 1,807,415 |
| | Other | \$ 6,381 | \$ 6,732 | \$ 4,766 | \$ 5,688 | \$ 4,918 | \$ 5,650 | \$ 5,925 | \$ 5,240 | \$ 5,119 | \$ 4,999 | \$ 4,878 |
| | Sheep and Lambs (\$1,000) | \$ 6,155 | \$ 6,441 | \$ 4,410 | \$ 5,267 | \$ 4,432 | \$ 5,099 | \$ 5,309 | \$ 4,559 | \$ 4,373 | \$ 4,188 | \$ 4,002 |
| | Aquaculture (\$1,000) | \$ 226 | \$ 291 | \$ 356 | \$ 421 | \$ 486 | \$ 551 | \$ 616 | \$ 681 | \$ 746 | \$ 811 | \$ 876 |
| | Total (\$1,000) | \$ 1,551,241 | \$ 1,574,729 | \$ 1,458,854 | \$ 1,922,117 | \$ 2,004,968 | \$ 1,527,938 | \$ 1,941,001 | \$ 2,516,813 | \$ 2,452,570 | \$ 2,281,565 | \$ 2,735,375 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 |
|--------------------------|--|--------------------|------------------|------------------|------------------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 7,061 | 5,395 | 7,219 | 8,989 |
| | Cattle feedlots (112112) | 183 | 142 | 102 | 68 |
| | Dairy cattle and milk production (11212) | 164 | 185 | 196 | 196 |
| | Hog and pig farming (1122) | 87 | 96 | 125 | 76 |
| | Poultry and egg production (1123) | 94 | 116 | 396 | 134 |
| | Sheep and goat farming (1124) | 403 | 344 | 1,634 | 1,222 |
| | Animal aquaculture and other animal production (1125,1129) | 1,168 | 2,692 | 3,091 | 3,852 |
| Value of Sales (\$1,000) | Cattle and Calves | 656,701 | 533,952 | 576,025 | 630,837 |
| | Hogs and Pigs | 1,250 | 381 | 375 | 392 |
| | Poultry and Eggs | 16,609 | 17,468 | withheld | 3,346 |
| | Milk and Other Dairy Products | 463,450 | 730,083 | 1,009,671 | 1,251,065 |
| | Aquaculture | withheld | 1,604 | 3,228 | 6,909 |
| | Other (calculated) | 29,883 | 19,285 | 32,641 | 16,440 |
| | Total | 1,167,893 | 1,302,773 | 1,621,940 | 1,908,989 |
| Input Purchases | Livestock and poultry purchased | (Farms) 4,419 | 3,708 | 4,054 | 4,962 |
| | | \$1,000 221,246 | 217,212 | 187,501 | 137,673 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 2,344 | 2,569 | 3,043 |
| | | \$1,000 <i>n/a</i> | 71,093 | 66,729 | 33,048 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 2,060 | 2,066 | 2,530 |
| | | \$1,000 <i>n/a</i> | 146,119 | 120,772 | 104,625 |
| Feed purchased | (Farms) 7,760 | 9,443 | 12,073 | 16,204 | |
| | \$1,000 334,541 | 486,979 | 697,004 | 1,124,762 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 2,273,786 | \$ 371,263 | 10,852 | \$ 93,670 |
| | Hogs, Pigs, and Other | \$ 9,010 | \$ 1,536 | 43 | \$ 388 |
| | Poultry and Eggs | \$ 81,925 | \$ 13,510 | 355 | \$ 3,409 |
| | Dairy | \$ 3,365,226 | \$ 593,374 | 16,741 | \$ 149,708 |
| | Total | \$ 5,729,947 | \$ 979,683 | 27,992 | \$ 247,174 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 676,115 | \$ 110,396 | 3,227 | \$ 27,853 |
| | Hogs, Pigs, and Other | \$ (5,450) | \$ (929) | (26) | \$ (234) |
| | Poultry and Eggs | \$ 2,435 | \$ 402 | 11 | \$ 101 |
| | Dairy | \$ 991,491 | \$ 174,825 | 4,932 | \$ 44,108 |
| | Total | \$ 1,664,590 | \$ 284,693 | 8,144 | \$ 71,828 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.5931 | \$ 0.4234 | 12.4 | |
| | Hogs, Pigs, and Other | \$ 1.6510 | \$ 0.2815 | 7.9 | |
| | Poultry and Eggs | \$ 1.7949 | \$ 0.2960 | 7.8 | |
| | Dairy | \$ 1.8619 | \$ 0.3283 | 9.3 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 4.9% |
| | Total | | | | 25.2% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: NEW YORK

New York Executive Summary

The use of soybean meal as a key feed ingredient is a moderate part of New York's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in New York. The success of New York animal agriculture in turn has a reasonable impact on the rest of the state and regional economies. For example, in the state of New York during 2014 animal agriculture contributed:

- \$6.9 billion in economic output
- 37,792 jobs
- \$1.2 billion in earnings
- \$310.7 million in income taxes paid at local, state, and federal levels
- \$208.9 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in New York increased economic output by over \$2.3 billion, boosted household earnings by \$384.2 million, contributed 12,494 additional jobs and paid \$102.9 million in additional tax revenues.

New York's animal agriculture consumed about 289.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (195.4 thousand tons)
- Egg-Laying Hens (29.9 thousand tons)
- Turkeys (22.8 thousand tons)

This report examines animal agriculture in New York over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in New York, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of New York and beyond.

New York Economic Impact of Animal Agriculture

Animal agriculture is a small part of New York's economy. In 2014, New York's animal agriculture contributed the following to the economy:

- About \$6.9 billion in economic output
- \$1.2 billion in household earnings
- 37,792 jobs
- \$310.7 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade New York's animal agriculture has:

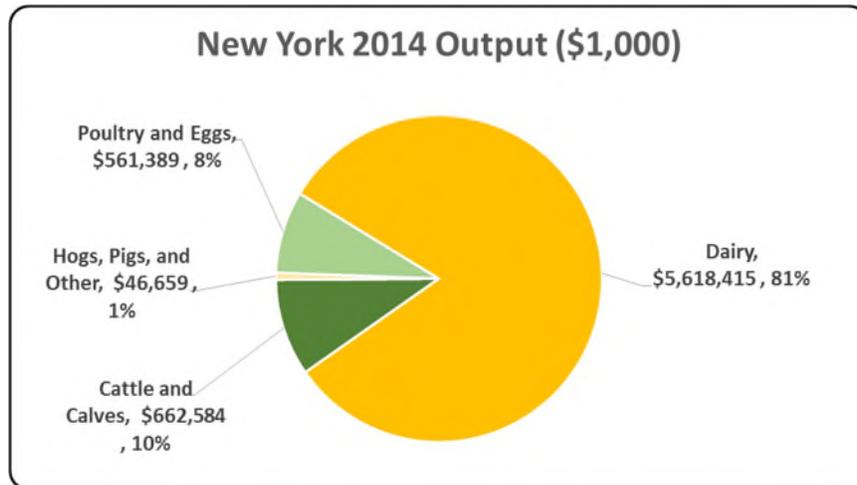
- Increased economic output by \$2.3 billion
- Boosted household earnings by \$384.2 million
- Added 12,494 jobs
- Paid an additional \$102.9 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 6,889,047 | \$ 2,301,887 | 50.18% |
| Earnings (\$1,000) | \$ 1,160,016 | \$ 384,220 | 49.53% |
| Employment (Jobs) | 37,792 | 12,494 | 49.39% |
| Income Taxes Paid (\$1,000) | \$ 310,652 | \$ 102,894 | 49.53% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 208,852 | | |

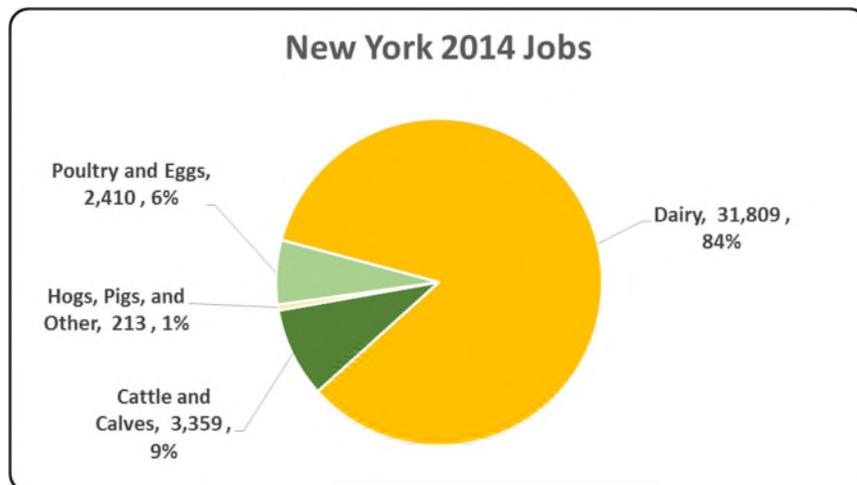
New York Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the New York economy. Animal agriculture’s impact on New York total economic output is about \$6.9 billion.



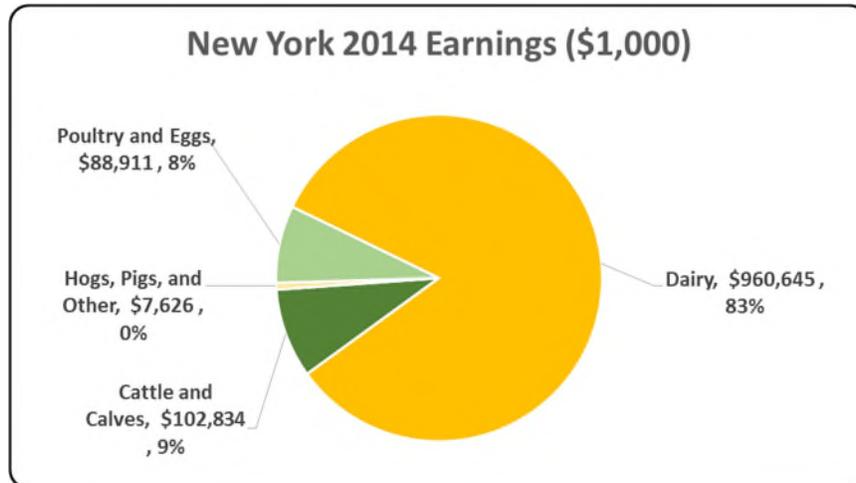
New York Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to New York in terms of animal agriculture jobs. As shown, animal agriculture contributes about 37,792 jobs within and outside of animal agriculture.



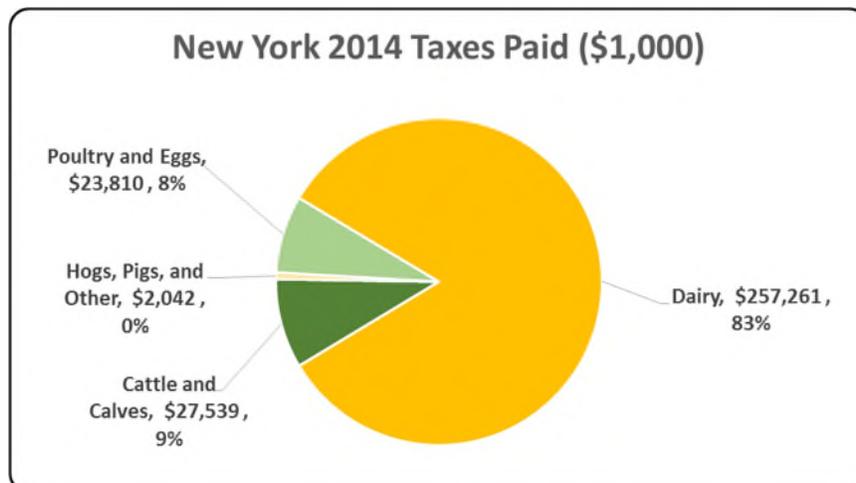
New York Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the New York economy in terms of earnings. New York’s animal agriculture contributed about \$1.2 billion to household earnings in 2014.



New York Taxes Paid by Animal Agriculture

New York’s animal agriculture is also a source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$310.7 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$208.9 million in property taxes paid by all of New York agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



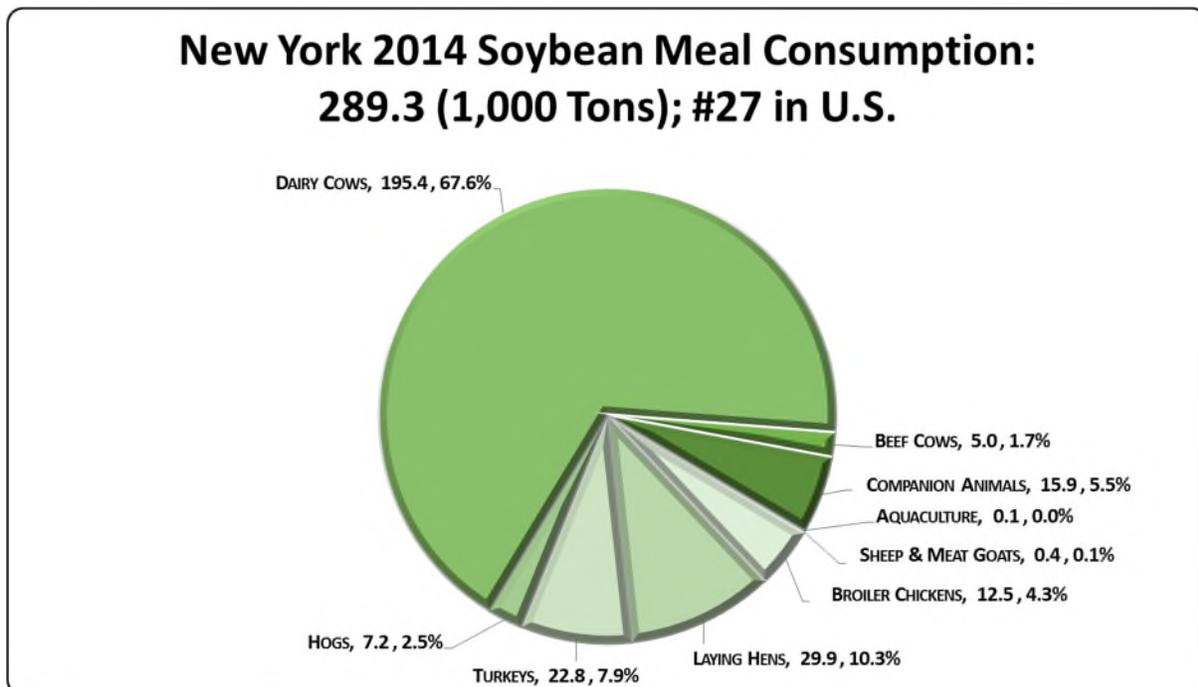
New York Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

New York's animal agriculture consumed almost 289.3 thousand tons of soybean meal in 2014, placing the state as #27 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (195.4 thousand tons)
- Egg-Laying Hens (29.9 thousand tons)
- Turkeys (22.8 thousand tons)

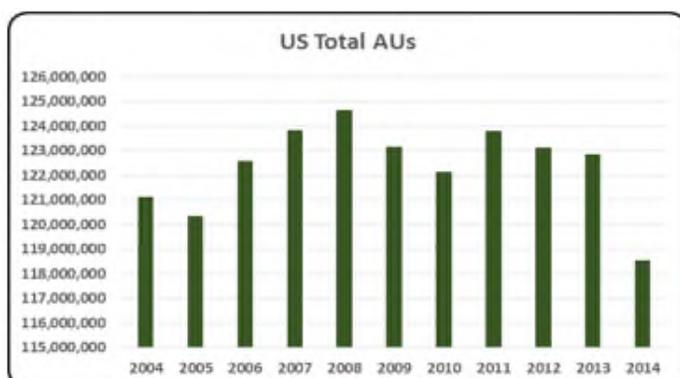


New York Animal Unit (AU) Trends

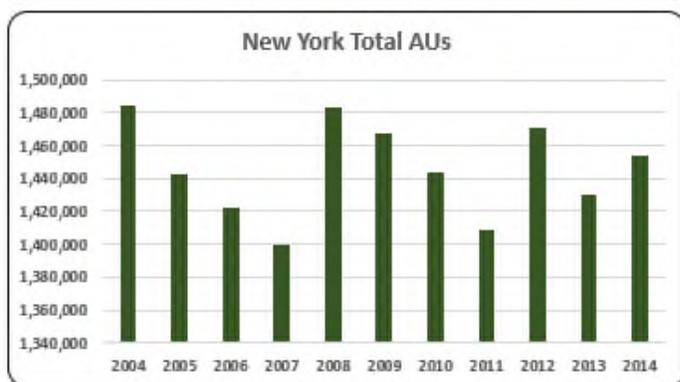
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of New York. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to New York and to give perspective on New York's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

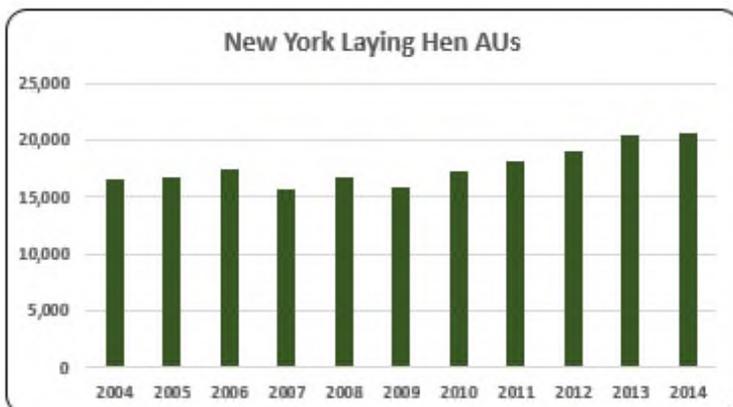
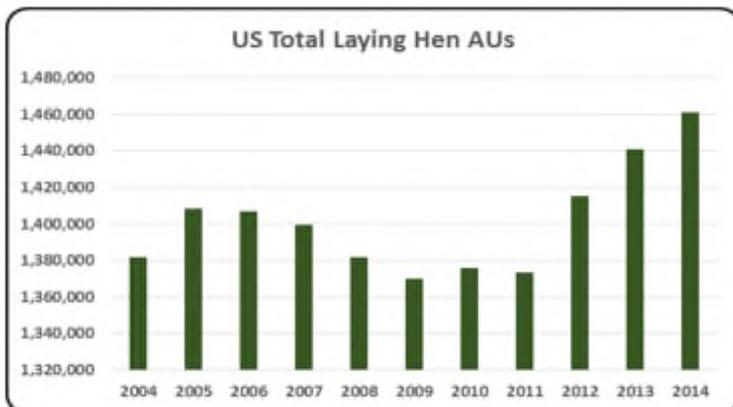
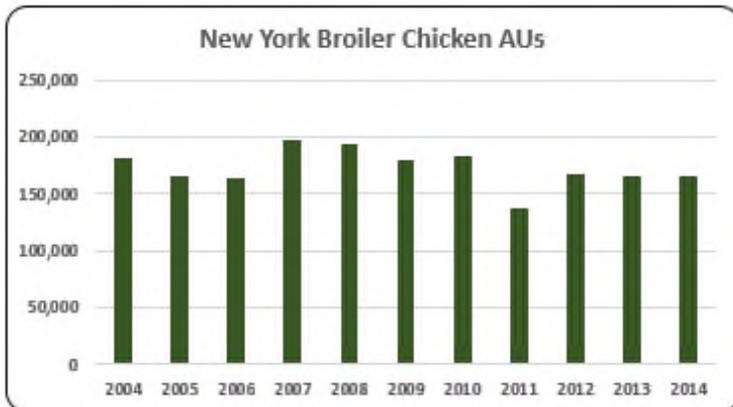
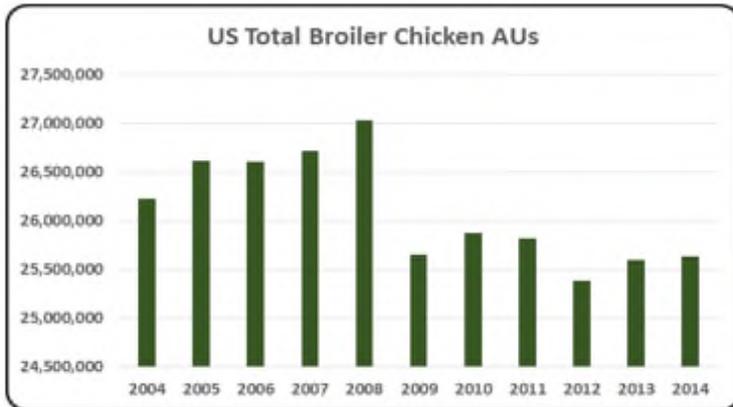
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In New York, the largest three segments of animal agriculture in terms of AUs during 2014 were: Dairy Cows (861.0 thousand AUs), Beef Cows (347.9 thousand AUs), and Broilers (165.2 thousand AUs). Total animal units in New York during 2014 were 1,453.6 thousand AUs.



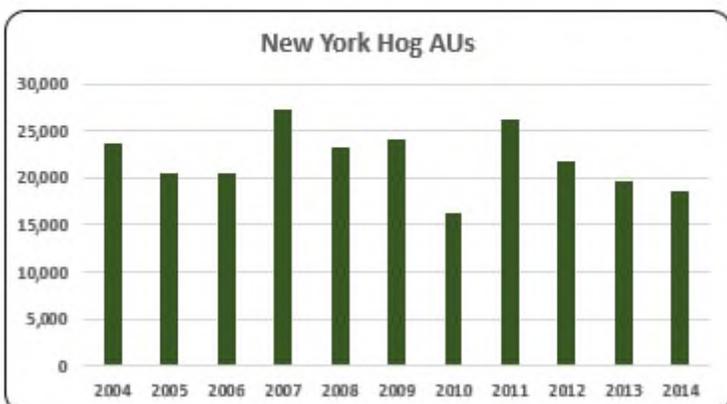
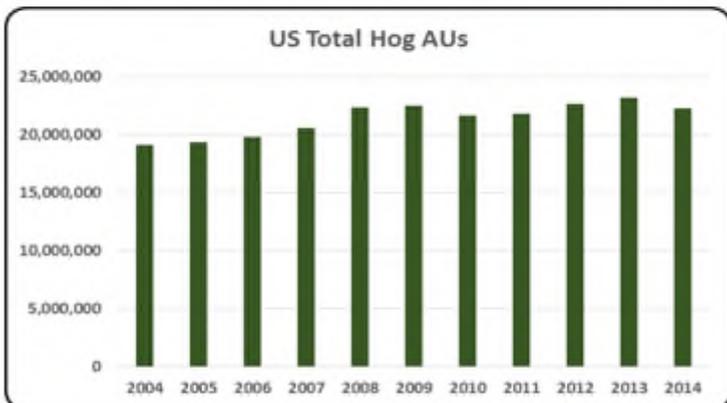
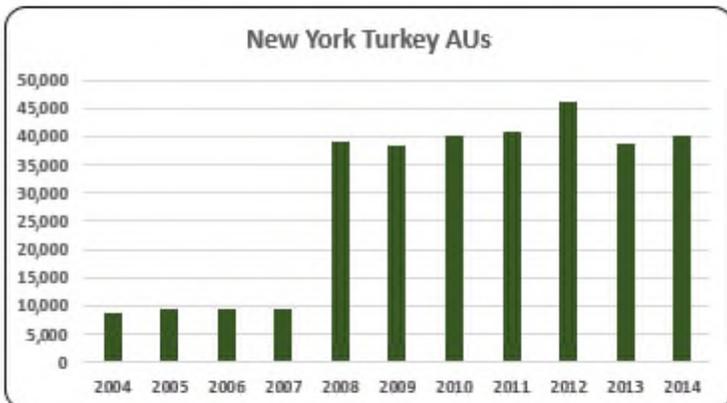
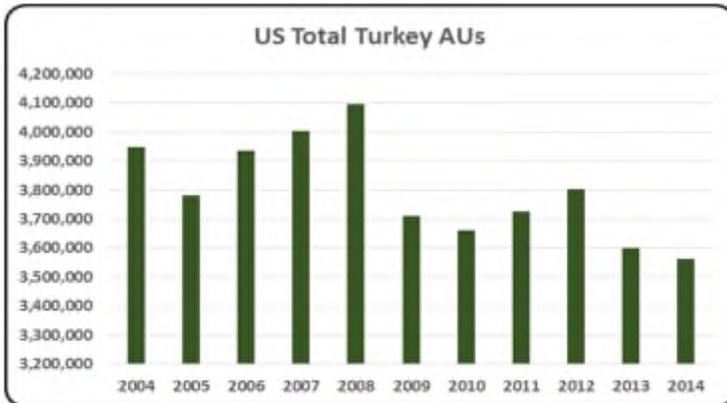
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



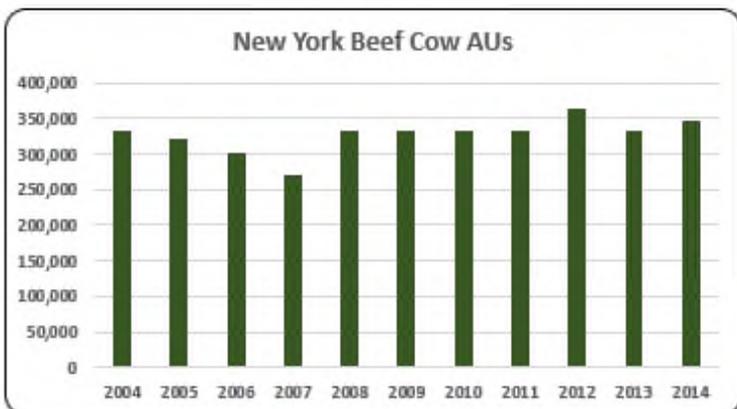
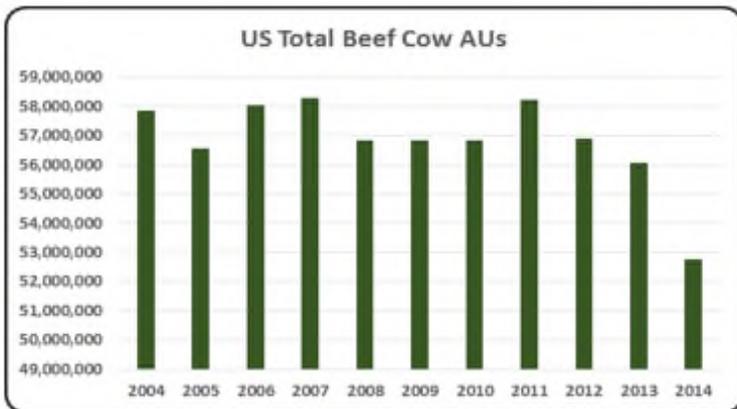
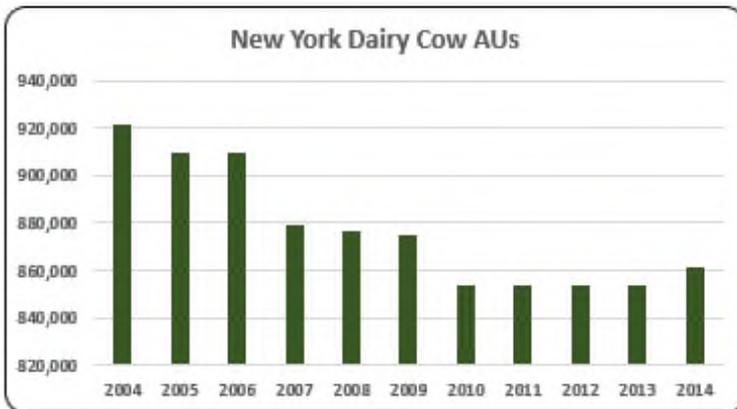
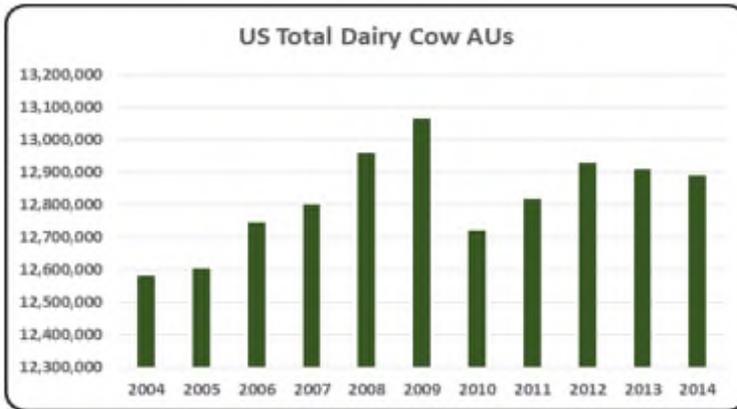
- Animal production in New York widely fluctuated during 2004 to 2014 from a record high of 1,484.8 thousand AUs in 2004 to record low of 1,399.2 thousand in 2007. Animal production in 2014 increased 1.6% to 1,453.6 year-over-year.



- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production in 2014 (165,210 broiler AUs) represented 11.4% of all animal production. Broiler production decreased 9.1% during 2004 to 2014.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- The average number of layer AUs from 2004 to 2014 was 17,681. Layer production in 2014 reached a record high of 20,632 layer AUs.



- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production represented 2.8% of animal production in 2014. Turkey AUs in 2014 climbed to a record high of 40,325 turkey AUs.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production declined 22% since the start of the decade. The average number of hog AUs was 21,993 from 2004 to 2014.



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.

- The leading animal production in New York is dairy cow production with 59.23% of all AUs in the state in 2014. However dairy cow numbers declined 7.0% during the 2004 to 2014 period.

- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.

- The second largest animal production in New York during 2004-2014 was beef cow production. Beef cow AUs grew 5.0% to 347,925. 2012 was a record year for beef cow production with 363,450 beef cow AUs.

New York Additional Information and Methodology

Animal agriculture is a moderate part of New York's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in New York, of interest is the degree to which the industry impacts the New York economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for New York animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted New York's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in New York which have occurred. As shown in this state report, New York has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in New York. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

New York Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on New York's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in New York, \$1.460 to \$1.611 million in total economic activity, \$0.239 to \$0.275 in household wages and 7 to 9 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.5612 | \$ 0.2423 | 7.9 |
| | Hogs, Pigs, and Other | \$ 1.4604 | \$ 0.2387 | 6.7 |
| | Poultry and Eggs | \$ 1.5640 | \$ 0.2477 | 6.7 |
| | Dairy | \$ 1.6107 | \$ 0.2754 | 9.1 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 332,775 | 321,825 | 301,575 | 270,600 | 333,600 | 333,600 | 333,600 | 331,950 | 363,450 | 331,350 | 347,925 |
| | Hog and Pig AUs | 23,700 | 20,490 | 20,490 | 27,285 | 23,280 | 24,120 | 16,305 | 26,295 | 21,705 | 19,725 | 18,525 |
| | Broiler AUs | 181,826 | 164,703 | 163,591 | 196,873 | 193,803 | 180,192 | 182,615 | 137,602 | 166,736 | 166,154 | 165,210 |
| | Turkey AUs | 8,700 | 9,349 | 9,502 | 9,513 | 39,196 | 38,394 | 39,991 | 40,705 | 46,286 | 38,611 | 40,325 |
| | Egg Layer AUs | 16,588 | 16,668 | 17,376 | 15,684 | 16,660 | 15,904 | 17,340 | 18,116 | 19,046 | 20,477 | 20,632 |
| | Dairy AUs | 921,200 | 910,000 | 910,000 | 879,200 | 876,400 | 875,000 | 854,000 | 854,000 | 854,000 | 854,000 | 861,000 |
| | Total Animal Units | 1,484,789 | 1,443,035 | 1,422,534 | 1,399,155 | 1,482,939 | 1,467,209 | 1,443,852 | 1,408,668 | 1,471,224 | 1,430,317 | 1,453,617 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 121,275 | \$ 160,535 | \$ 144,013 | \$ 95,331 | \$ 104,390 | \$ 127,438 | \$ 166,544 | \$ 259,842 | \$ 305,678 | \$ 334,031 | \$ 424,407 |
| | Hogs and Pigs (\$1,000) | \$ 14,929 | \$ 12,248 | \$ 11,754 | \$ 10,784 | \$ 9,508 | \$ 8,708 | \$ 11,264 | \$ 18,669 | \$ 16,818 | \$ 16,325 | \$ 20,977 |
| | Broilers (\$1,000) | \$ 112,592 | \$ 134,043 | \$ 103,586 | \$ 148,105 | \$ 152,425 | \$ 132,032 | \$ 138,968 | \$ 122,439 | \$ 166,098 | \$ 202,349 | \$ 212,271 |
| | Turkeys (\$1,000) | \$ 5,911 | \$ 6,446 | \$ 7,434 | \$ 8,108 | \$ 8,870 | \$ 9,627 | \$ 10,385 | \$ 11,143 | \$ 11,901 | \$ 12,659 | \$ 13,417 |
| | Eggs (\$1,000) | \$ 59,844 | \$ 34,671 | \$ 39,246 | \$ 73,945 | \$ 96,871 | \$ 66,428 | \$ 66,177 | \$ 82,740 | \$ 93,883 | \$ 107,145 | \$ 133,257 |
| | Milk (\$1,000) | \$ 1,957,200 | \$ 1,920,402 | \$ 1,614,030 | \$ 2,384,291 | \$ 2,386,944 | \$ 1,689,664 | \$ 2,212,062 | \$ 2,747,332 | \$ 2,558,860 | \$ 2,854,156 | \$ 3,488,182 |
| | Other | \$ 12,136 | \$ 11,938 | \$ 11,507 | \$ 11,065 | \$ 11,143 | \$ 11,161 | \$ 11,988 | \$ 11,225 | \$ 11,141 | \$ 11,057 | \$ 10,972 |
| | Sheep and Lambs (\$1,000) | \$ 3,045 | \$ 3,025 | \$ 2,772 | \$ 2,507 | \$ 2,763 | \$ 2,959 | \$ 3,964 | \$ 3,379 | \$ 3,472 | \$ 3,566 | \$ 3,659 |
| | Aquaculture (\$1,000) | \$ 9,091 | \$ 8,913 | \$ 8,735 | \$ 8,558 | \$ 8,380 | \$ 8,202 | \$ 8,024 | \$ 7,847 | \$ 7,669 | \$ 7,491 | \$ 7,313 |
| | Total (\$1,000) | \$ 2,283,887 | \$ 2,280,283 | \$ 1,931,570 | \$ 2,731,628 | \$ 2,770,150 | \$ 2,045,058 | \$ 2,617,389 | \$ 3,253,390 | \$ 3,164,379 | \$ 3,537,722 | \$ 4,303,483 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|------------------|------------------|------------------|------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 4,821 | 3,974 | 4,302 | 4,453 | |
| | Cattle feedlots (112112) | 580 | 1,038 | 501 | 143 | |
| | Dairy cattle and milk production (11212) | 7,852 | 6,531 | 5,237 | 4,694 | |
| | Hog and pig farming (1122) | 314 | 363 | 385 | 422 | |
| | Poultry and egg production (1123) | 281 | 423 | 1,005 | 882 | |
| | Sheep and goat farming (1124) | 696 | 1,115 | 1,068 | 1,120 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,602 | 4,976 | 5,111 | 5,171 | |
| Value of Sales (\$1,000) | Cattle and Calves | 216,075 | 251,121 | 318,080 | 449,497 | |
| | Hogs and Pigs | 15,108 | 14,005 | 28,302 | 38,999 | |
| | Poultry and Eggs | 87,265 | 106,620 | 123,727 | 144,663 | |
| | Milk and Other Dairy Products | 1,461,624 | 1,560,895 | 2,280,218 | 2,417,398 | |
| | Aquaculture | 1,833 | 15,185 | 20,417 | 18,036 | |
| | Other (calculated) | 82,317 | 34,880 | 85,962 | 39,094 | |
| | Total | 1,864,222 | 1,982,706 | 2,856,706 | 3,107,687 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 9,787 | 9,678 | 8,447 | 10,255 |
| | | \$1,000 | 111,258 | 122,666 | 117,208 | 139,833 |
| | Breeding livestock purchased | (Farms) | n/a | 5,796 | 4,657 | 5,449 |
| | | \$1,000 | n/a | 50,639 | 49,526 | 72,677 |
| | Other livestock and poultry purchased | (Farms) | n/a | 5,053 | 5,103 | 6,538 |
| | | \$1,000 | n/a | 72,026 | 67,683 | 67,156 |
| | Feed purchased | (Farms) | 17,393 | 22,148 | 18,994 | 21,869 |
| | | \$1,000 | 482,735 | 537,185 | 695,165 | 1,007,295 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 662,584 | \$ 102,834 | 3,359 | \$ 27,539 |
| | Hogs, Pigs, and Other | \$ 46,659 | \$ 7,626 | 213 | \$ 2,042 |
| | Poultry and Eggs | \$ 561,389 | \$ 88,911 | 2,410 | \$ 23,810 |
| | Dairy | \$ 5,618,415 | \$ 960,645 | 31,809 | \$ 257,261 |
| | Total | \$ 6,889,047 | \$ 1,160,016 | 37,792 | \$ 310,652 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 425,304 | \$ 66,008 | 2,156 | \$ 17,677 |
| | Hogs, Pigs, and Other | \$ (2,876) | \$ (470) | (13) | \$ (126) |
| | Poultry and Eggs | \$ 211,819 | \$ 33,547 | 909 | \$ 8,984 |
| | Dairy | \$ 1,667,640 | \$ 285,136 | 9,442 | \$ 76,359 |
| | Total | \$ 2,301,887 | \$ 384,220 | 12,494 | \$ 102,894 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.5612 | \$ 0.2423 | 7.9 | |
| | Hogs, Pigs, and Other | \$ 1.4604 | \$ 0.2387 | 6.7 | |
| | Poultry and Eggs | \$ 1.5640 | \$ 0.2477 | 6.7 | |
| | Dairy | \$ 1.6107 | \$ 0.2754 | 9.1 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 6.5% |
| | Total | | | | 26.8% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: NORTH CAROLINA

North Carolina Executive Summary

The use of soybean meal as a key feed ingredient is an important part of North Carolina's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in North Carolina. The success of North Carolina animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of North Carolina during 2014 animal agriculture contributed:

- \$21.1 billion in economic output
- 96,077 jobs
- \$3.8 billion in earnings
- \$1.0 billion in income taxes paid at local, state, and federal levels
- \$142.4 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in North Carolina increased economic output by over \$5.4 billion, boosted household earnings by \$970.0 million, contributed 24,246 additional jobs and paid \$265.1 million in additional tax revenues.

North Carolina's animal agriculture consumed about 2.1 million tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (932.3 thousand tons)
- Hogs (833.3 thousand tons)
- Turkeys (241.5 thousand tons)

This report examines animal agriculture in North Carolina over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in North Carolina, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of North Carolina and beyond.

North Carolina Economic Impact of Animal Agriculture

Animal agriculture is an integral part of North Carolina's economy. In 2014, North Carolina's animal agriculture contributed the following to the economy:

- About \$21.1 billion in economic output
- \$3.8 billion in household earnings
- 96,077 jobs
- \$1.0 billion in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade North Carolina's animal agriculture has:

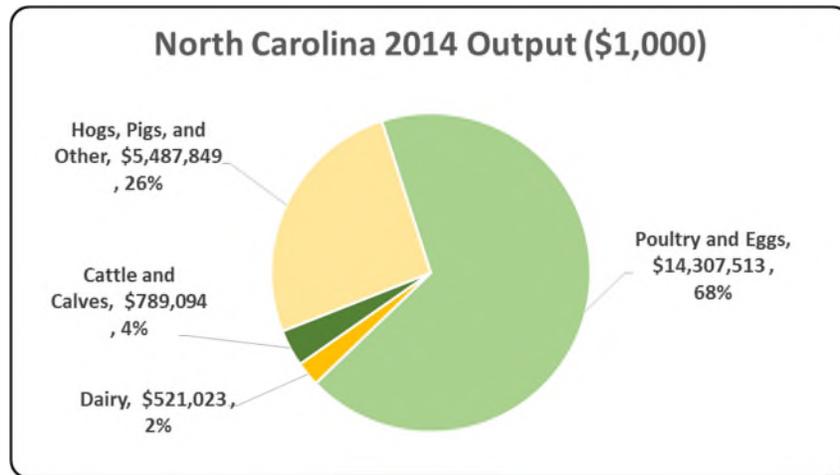
- Increased economic output by \$5.4 billion
- Boosted household earnings by \$970.0 million
- Added 24,246 jobs
- Paid an additional \$265.1 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 21,105,479 | \$ 5,414,084 | 34.50% |
| Earnings (\$1,000) | \$ 3,784,453 | \$ 969,961 | 34.46% |
| Employment (Jobs) | 96,077 | 24,246 | 33.75% |
| Income Taxes Paid (\$1,000) | \$ 1,034,291 | \$ 265,090 | 34.46% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 142,392 | | |

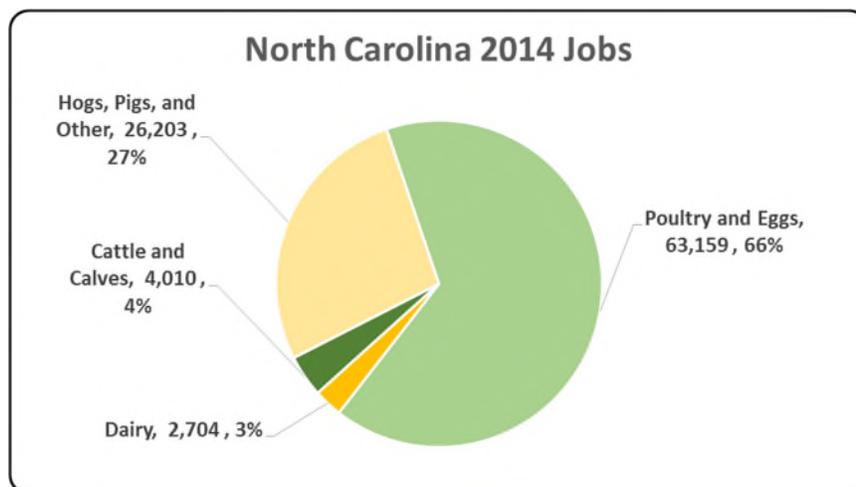
North Carolina Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the North Carolina economy. Animal agriculture’s impact on North Carolina total economic output is about \$21.1 billion.



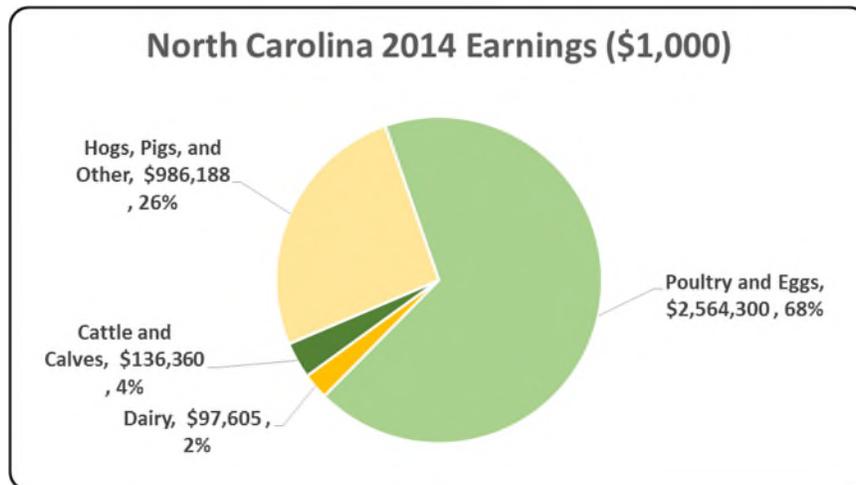
North Carolina Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to North Carolina in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to North Carolina total jobs, contributing 96,077 jobs within and outside of animal agriculture.



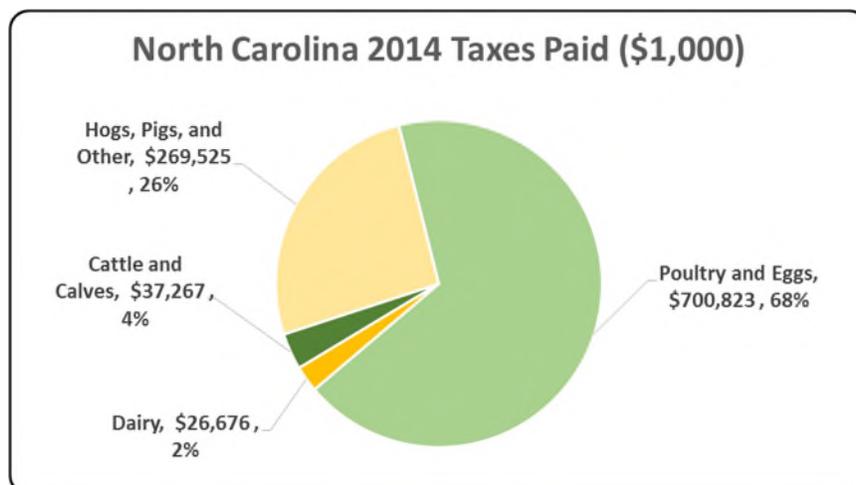
North Carolina Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the North Carolina economy in terms of earnings. North Carolina’s animal agriculture contributed about \$3.8 billion to household earnings in 2014.



North Carolina Taxes Paid by Animal Agriculture

North Carolina’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$1.0 billion in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$142.4 million in property taxes paid by all of North Carolina agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



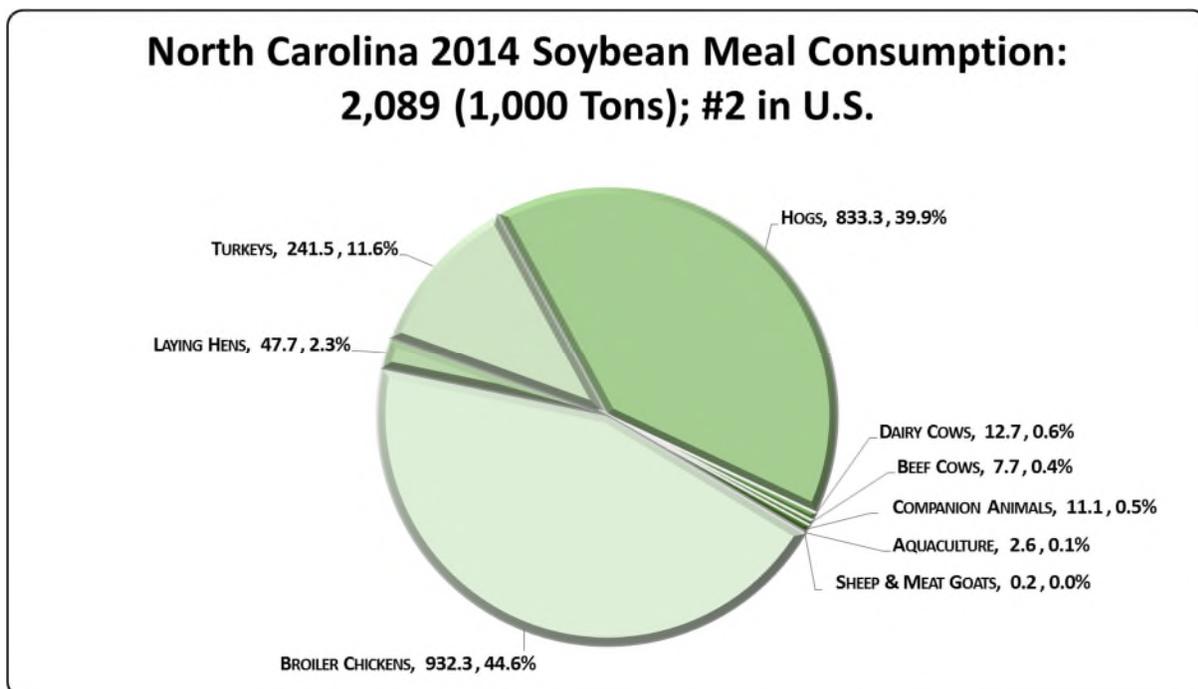
North Carolina Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

North Carolina's animal agriculture consumed almost 2,089.0 thousand tons of soybean meal in 2014, placing the state as #2 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (932.3 thousand tons)
- Hogs (833.3 thousand tons)
- Turkeys (241.5 thousand tons)

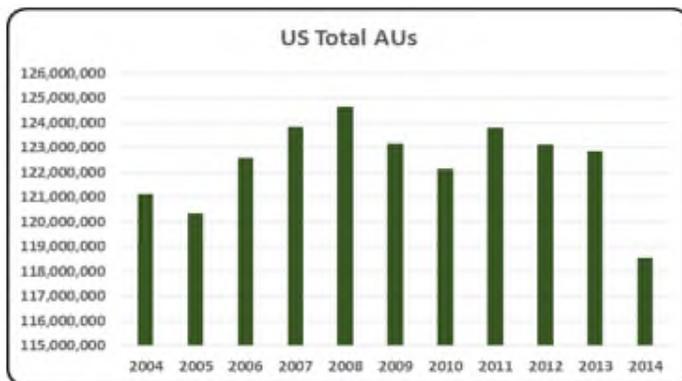


North Carolina Animal Unit (AU) Trends

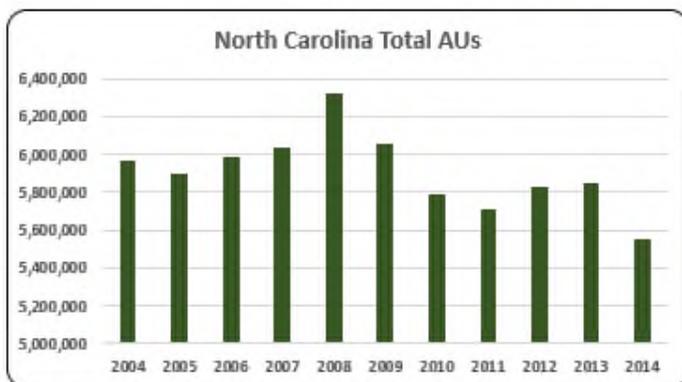
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of North Carolina. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to North Carolina and to give perspective on North Carolina’s contribution to the nation’s animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

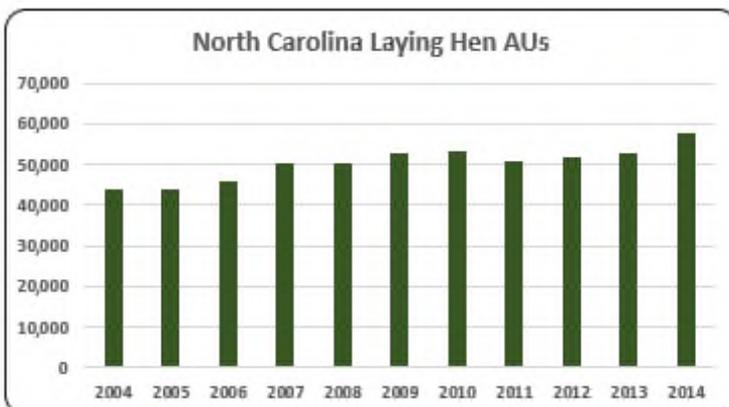
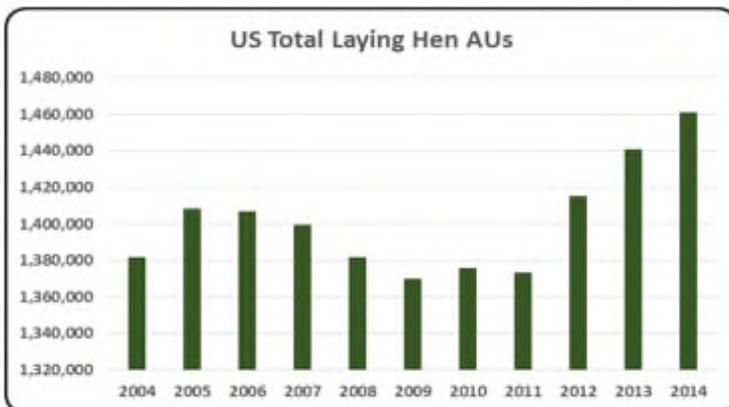
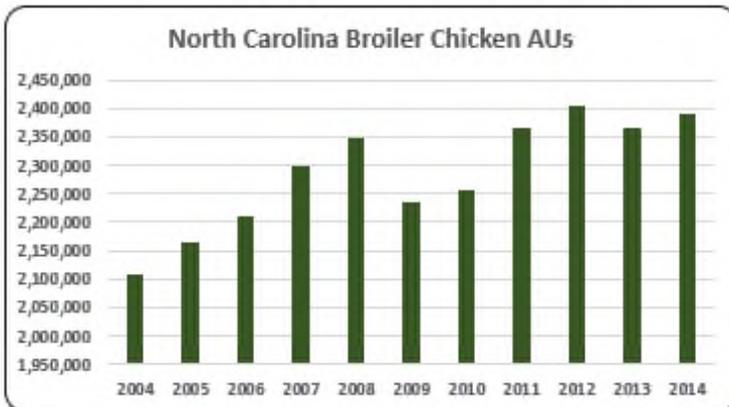
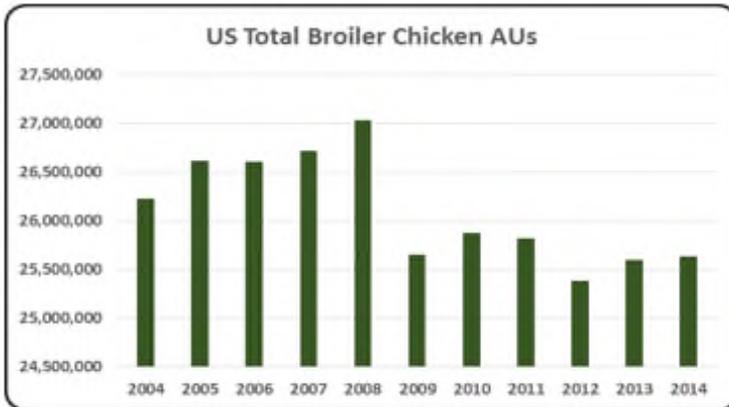
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In North Carolina, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (2,390.0 thousand AUs), Hogs (2,296.2 thousand AUs), and Turkeys (427.4 thousand AUs). Total animal units in North Carolina during 2014 were 5,551.9 thousand AUs.



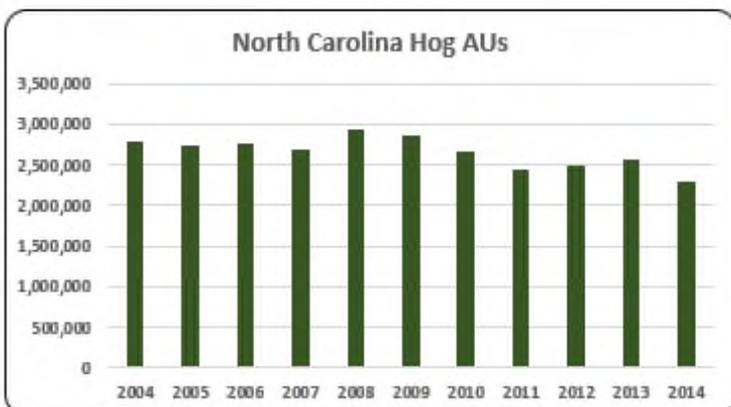
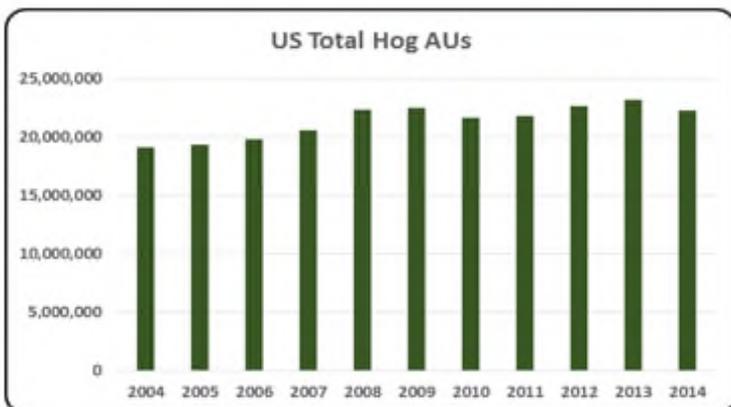
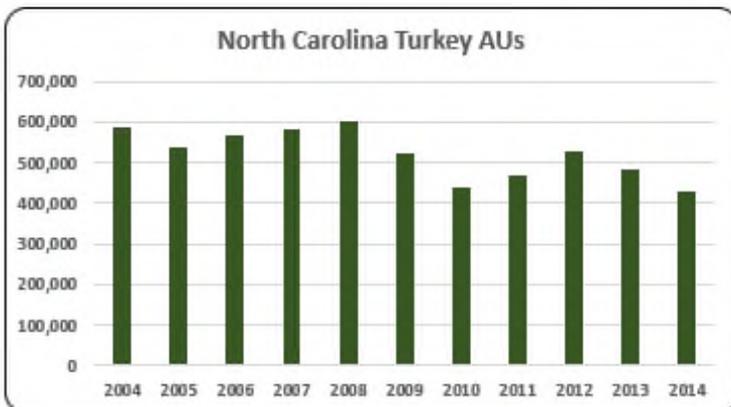
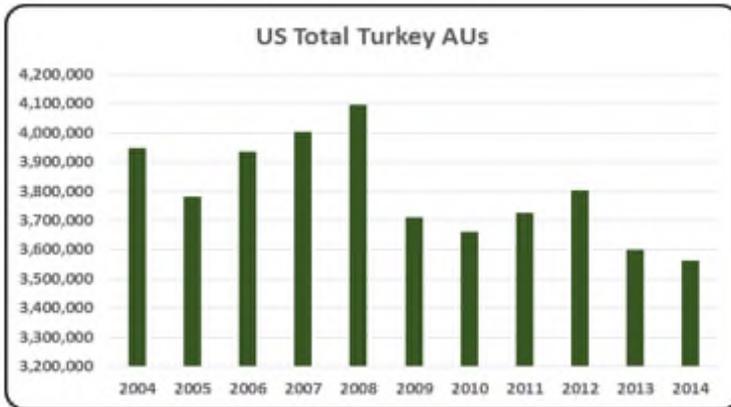
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



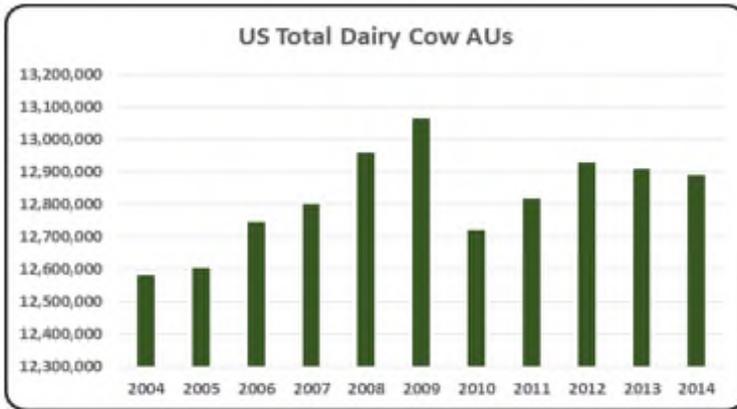
- About 4.7% of all AUs in the U.S. were in North Carolina in 2014. 2008 was a record year for animal production in North Carolina with 6,317.5 thousand whereas 2014 was a low year with 5,551.9 thousand AUs.



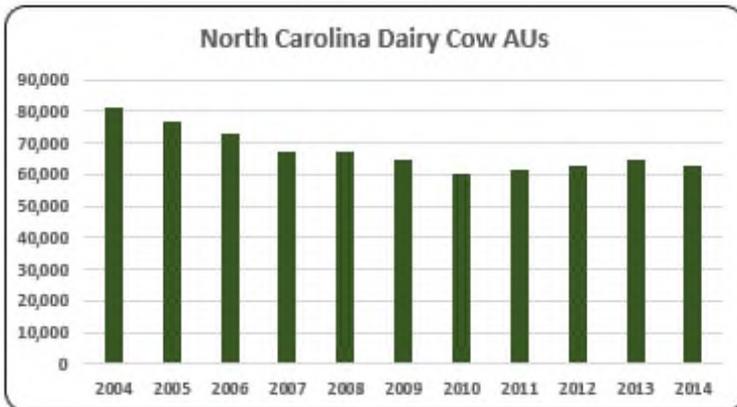
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Forty three percent (2,390.0 thousand) of all AUs in 2014 were from broiler production in 2014. There was an upward trend in the broiler industry during the last decade and broiler production increased 13.4% from 2004 to 2014.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Only 1.0% (57,581) of all AUs in North Carolina were in layer production in 2014. The average number of layers during last decade was about 50,295 AUs.



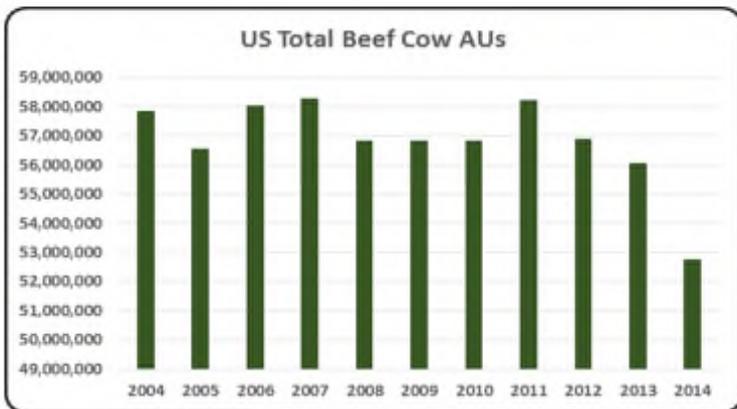
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production declined almost 12.0% in 2014 year-over-year. North Carolina represented 12.0% of all turkey AUs in the U.S. Overall, turkey AUs decreased 27% during the 2004-2014 period.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production is the second largest animal production in North Carolina with 41.4% (2,296.2 thousand hog AUs) in 2014. Hog AUs in North Carolina experienced a downward trend during the last decade.



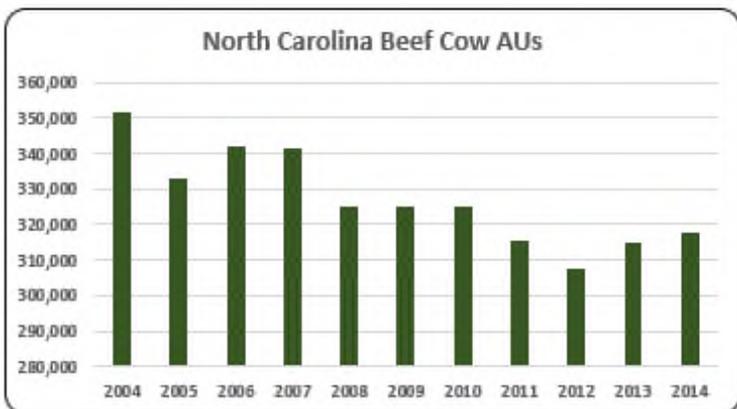
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- The average number of dairy cow AUs in North Carolina was 67,455 from 2004 to 2014. Dairy cow production decreased 22.0% throughout the decade.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. Large producers of cattle and calves such as Texas and Oklahoma were plagued with drought conditions during 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.

North Carolina Additional Information and Methodology

Animal agriculture is an important part of North Carolina's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in North Carolina, of interest is the degree to which the industry impacts the North Carolina economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for North Carolina animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted North Carolina's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in North Carolina which have occurred. As shown in this state report, North Carolina has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in North Carolina. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

North Carolina Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on North Carolina's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in North Carolina, \$1.881 to \$2.814 million in total economic activity, \$0.325 to \$0.504 in household wages and 9 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.8813 | \$ 0.3251 | 9.6 |
| | Hogs, Pigs, and Other | \$ 1.9048 | \$ 0.3423 | 9.1 |
| | Poultry and Eggs | \$ 2.8143 | \$ 0.5044 | 12.4 |
| | Dairy | \$ 2.1096 | \$ 0.3952 | 10.9 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 351,450 | 333,075 | 341,850 | 341,280 | 325,275 | 325,275 | 325,275 | 315,420 | 307,575 | 314,850 | 317,775 |
| | Hog and Pig AUs | 2,794,950 | 2,739,000 | 2,753,850 | 2,696,400 | 2,923,650 | 2,855,250 | 2,650,845 | 2,446,500 | 2,480,415 | 2,562,150 | 2,296,200 |
| | Broiler AUs | 2,108,495 | 2,165,973 | 2,209,007 | 2,297,558 | 2,347,373 | 2,235,055 | 2,255,662 | 2,364,262 | 2,403,427 | 2,364,243 | 2,390,001 |
| | Turkey AUs | 585,000 | 535,312 | 565,599 | 581,320 | 603,884 | 520,188 | 438,859 | 467,418 | 525,879 | 485,177 | 427,362 |
| | Egg Layer AUs | 43,736 | 43,880 | 45,988 | 50,184 | 50,080 | 52,744 | 53,336 | 50,824 | 51,918 | 52,979 | 57,581 |
| | Dairy AUs | 81,200 | 77,000 | 72,800 | 67,200 | 67,200 | 64,400 | 60,200 | 61,600 | 63,000 | 64,400 | 63,000 |
| | Total Animal Units | 5,964,831 | 5,894,240 | 5,989,094 | 6,033,942 | 6,317,462 | 6,052,912 | 5,784,178 | 5,706,024 | 5,832,214 | 5,843,798 | 5,551,919 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 259,278 | \$ 244,253 | \$ 219,639 | \$ 204,135 | \$ 210,118 | \$ 205,617 | \$ 236,278 | \$ 306,298 | \$ 316,790 | \$ 304,014 | \$ 419,441 |
| | Hogs and Pigs (\$1,000) | \$ 2,066,969 | \$ 2,088,694 | \$ 1,890,022 | \$ 1,931,118 | \$ 2,115,293 | \$ 1,809,998 | \$ 2,167,461 | \$ 2,471,953 | \$ 2,553,214 | \$ 2,824,115 | \$ 2,854,413 |
| | Broilers (\$1,000) | \$ 2,041,785 | \$ 2,231,782 | \$ 1,937,734 | \$ 2,479,538 | \$ 2,526,826 | \$ 2,429,960 | \$ 2,612,054 | \$ 2,564,433 | \$ 2,838,600 | \$ 3,580,997 | \$ 3,849,710 |
| | Turkeys (\$1,000) | \$ 448,812 | \$ 485,001 | \$ 517,500 | \$ 596,596 | \$ 652,320 | \$ 523,128 | \$ 591,090 | \$ 702,733 | \$ 859,144 | \$ 757,435 | \$ 733,163 |
| | Eggs (\$1,000) | \$ 239,062 | \$ 249,368 | \$ 257,627 | \$ 328,664 | \$ 373,944 | \$ 349,371 | \$ 327,373 | \$ 375,573 | \$ 392,549 | \$ 431,359 | \$ 500,989 |
| | Milk (\$1,000) | \$ 173,032 | \$ 165,968 | \$ 140,656 | \$ 191,568 | \$ 191,780 | \$ 134,368 | \$ 167,138 | \$ 207,016 | \$ 192,700 | \$ 200,090 | \$ 246,977 |
| | Other | \$ 25,550 | \$ 25,459 | \$ 25,468 | \$ 25,519 | \$ 25,833 | \$ 25,843 | \$ 26,405 | \$ 26,254 | \$ 26,386 | \$ 26,518 | \$ 26,650 |
| | Sheep and Lambs (\$1,000) | \$ 871 | \$ 734 | \$ 697 | \$ 701 | \$ 969 | \$ 933 | \$ 1,449 | \$ 1,251 | \$ 1,337 | \$ 1,423 | \$ 1,509 |
| | Aquaculture (\$1,000) | \$ 24,679 | \$ 24,725 | \$ 24,771 | \$ 24,818 | \$ 24,864 | \$ 24,910 | \$ 24,956 | \$ 25,003 | \$ 25,049 | \$ 25,095 | \$ 25,141 |
| | Total (\$1,000) | \$ 5,254,488 | \$ 5,490,525 | \$ 4,988,646 | \$ 5,757,138 | \$ 6,096,114 | \$ 5,478,285 | \$ 6,127,799 | \$ 6,654,260 | \$ 7,179,383 | \$ 8,124,528 | \$ 8,631,343 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 14,594 | 16,761 | 14,413 | 13,909 | |
| | Cattle feedlots (112112) | 443 | 13 | 3 | 10 | |
| | Dairy cattle and milk production (11212) | 612 | 740 | 381 | 263 | |
| | Hog and pig farming (1122) | 2,017 | 1,735 | 1,619 | 1,170 | |
| | Poultry and egg production (1123) | 3,564 | 3,827 | 4,096 | 3,404 | |
| | Sheep and goat farming (1124) | 464 | 1,004 | 2,437 | 1,922 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,689 | 5,232 | 6,290 | 5,190 | |
| Value of Sales (\$1,000) | Cattle and Calves | 177,058 | 185,222 | 288,801 | 332,733 | |
| | Hogs and Pigs | 2,570,376 | 2,183,646 | 3,104,731 | 2,873,988 | |
| | Poultry and Eggs | 2,254,453 | 2,382,365 | 4,087,004 | 4,837,026 | |
| | Milk and Other Dairy Products | 180,130 | 150,406 | 161,373 | 179,265 | |
| | Aquaculture | 11,510 | 17,669 | 32,175 | 23,365 | |
| | Other (calculated) | 38,180 | 33,744 | 33,266 | 15,340 | |
| | Total | 5,231,707 | 4,953,052 | 7,707,350 | 8,261,717 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 11,609 | 11,972 | 12,342 | 12,827 | |
| | | \$1,000 | 916,191 | 1,049,514 | 1,666,076 | 1,397,510 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 5,119 | 5,004 | 5,806 | |
| | | \$1,000 | <i>n/a</i> | 57,036 | 131,277 | 136,342 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 7,997 | 8,677 | 8,692 | |
| | | \$1,000 | <i>n/a</i> | 992,478 | 1,534,800 | 1,261,168 |
| Feed purchased | (Farms) | 22,116 | 30,938 | 28,263 | 29,837 | |
| | \$1,000 | 2,262,032 | 1,917,997 | 3,183,993 | 4,121,552 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|----------------------|---------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 789,094 | \$ 136,360 | 4,010 | \$ 37,267 |
| | Hogs, Pigs, and Other | \$ 5,487,849 | \$ 986,188 | 26,203 | \$ 269,525 |
| | Poultry and Eggs | \$ 14,307,513 | \$ 2,564,300 | 63,159 | \$ 700,823 |
| | Dairy | \$ 521,023 | \$ 97,605 | 2,704 | \$ 26,676 |
| | Total | \$ 21,105,479 | \$ 3,784,453 | 96,077 | \$ 1,034,291 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 177,792 | \$ 30,724 | 904 | \$ 8,397 |
| | Hogs, Pigs, and Other | \$ 492,669 | \$ 88,535 | 2,352 | \$ 24,197 |
| | Poultry and Eggs | \$ 4,680,066 | \$ 838,797 | 20,660 | \$ 229,243 |
| | Dairy | \$ 63,557 | \$ 11,906 | 330 | \$ 3,254 |
| | Total | \$ 5,414,084 | \$ 969,961 | 24,246 | \$ 265,090 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.8813 | \$ 0.3251 | 9.6 | |
| | Hogs, Pigs, and Other | \$ 1.9048 | \$ 0.3423 | 9.1 | |
| | Poultry and Eggs | \$ 2.8143 | \$ 0.5044 | 12.4 | |
| | Dairy | \$ 2.1096 | \$ 0.3952 | 10.9 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 7.0% |
| | Total | | | | 27.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: NORTH DAKOTA

North Dakota Executive Summary

The use of soybean meal as a key feed ingredient is a modest part of North Dakota's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in North Dakota. The success of North Dakota animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of North Dakota during 2014 animal agriculture contributed:

- \$3.5 billion in economic output
- 14,139 jobs
- \$550.0 million in earnings
- \$127.3 million in income taxes paid at local, state, and federal levels
- \$129.9 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in North Dakota increased economic output by over \$596.4 million, boosted household earnings by \$94.0 million, contributed 2,404 additional jobs and paid \$21.8 million in additional tax revenues.

North Dakota's animal agriculture consumed about 97.1 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Beef Cows (53.8 thousand tons)
- Hogs (34.5 thousand tons)
- Dairy Cows (3.2 thousand tons)

This report examines animal agriculture in North Dakota over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in North Dakota, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of North Dakota and beyond.

North Dakota Economic Impact of Animal Agriculture

Animal agriculture is an integral part of North Dakota's economy. In 2014, North Dakota's animal agriculture contributed the following to the economy:

- About \$3.5 billion in economic output
- \$550.0 million in household earnings
- 14,139 jobs
- \$127.3 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade North Dakota's animal agriculture has:

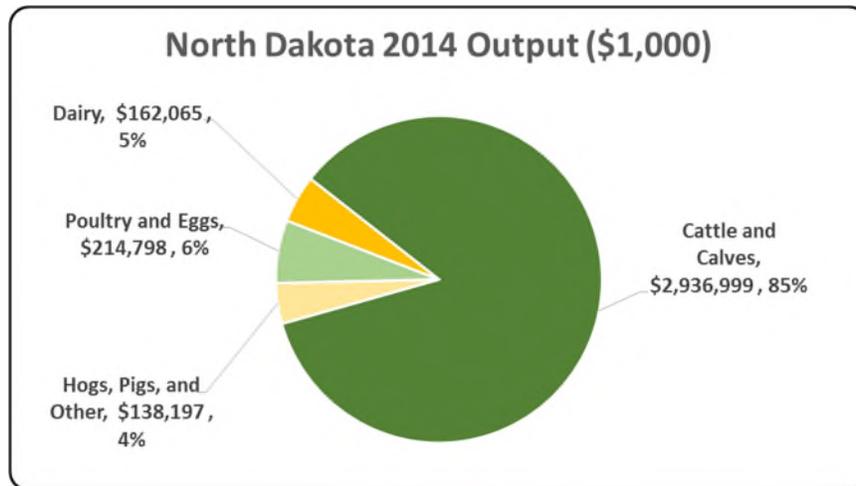
- Increased economic output by \$596.4 million
- Boosted household earnings by \$94.0 million
- Added 2,404 jobs
- Paid an additional \$21.8 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 3,452,060 | \$ 596,415 | 20.89% |
| Earnings (\$1,000) | \$ 549,985 | \$ 94,022 | 20.62% |
| Employment (Jobs) | 14,139 | 2,404 | 20.48% |
| Income Taxes Paid (\$1,000) | \$ 127,322 | \$ 21,766 | 20.62% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 129,909 | | |

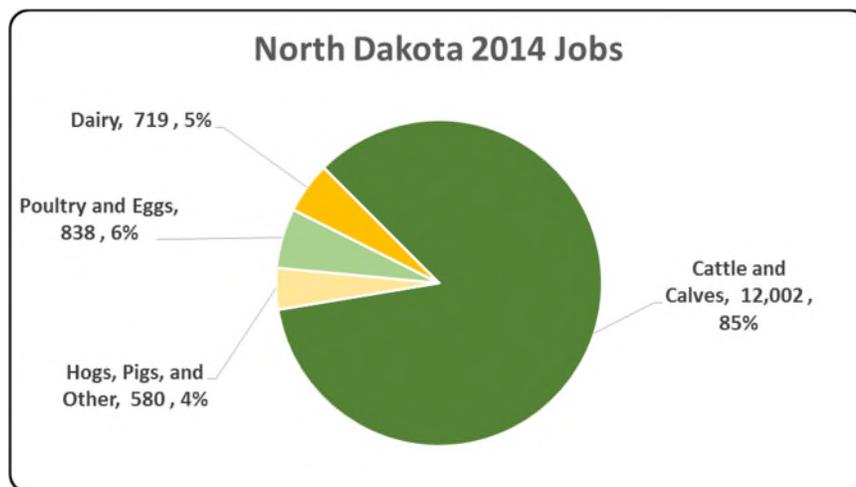
North Dakota Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the North Dakota economy. Animal agriculture’s impact on North Dakota total economic output is about \$3.5 billion.



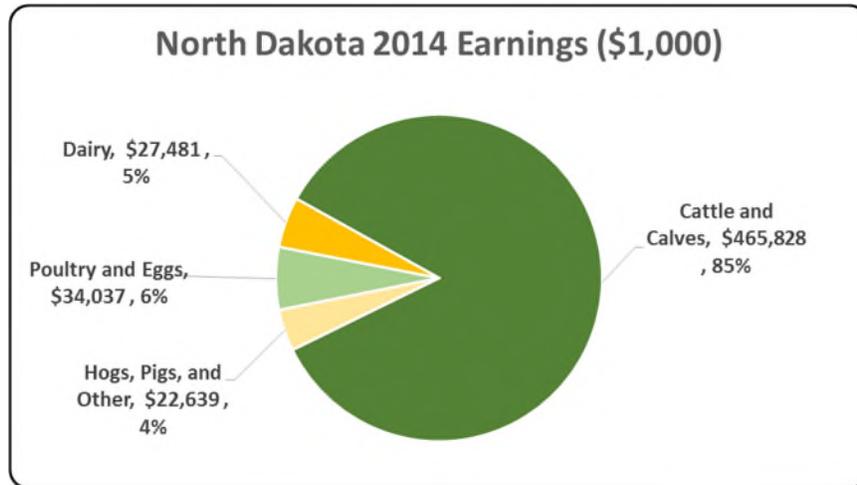
North Dakota Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to North Dakota in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to North Dakota total jobs, contributing 14,139 jobs within and outside of animal agriculture.



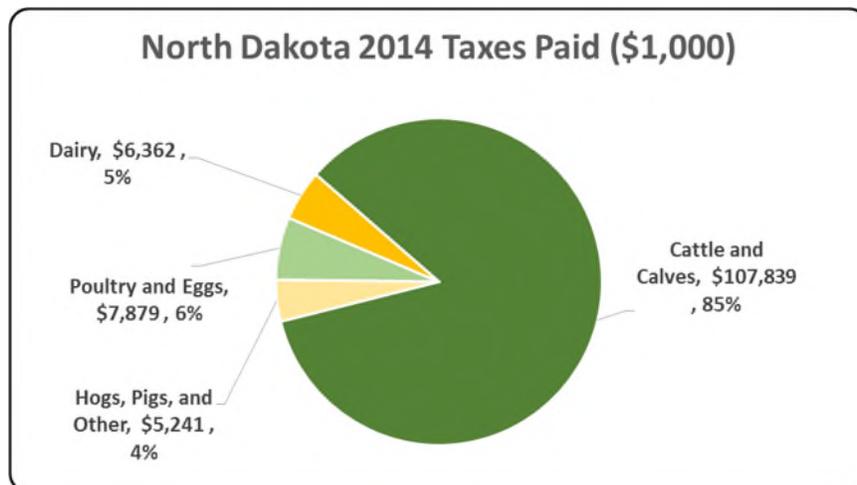
North Dakota Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the North Dakota economy in terms of earnings. North Dakota’s animal agriculture contributed about \$550.0 million to household earnings in 2014.



North Dakota Taxes Paid by Animal Agriculture

North Dakota’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$127.3 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$129.9 million in property taxes paid by all of North Dakota agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



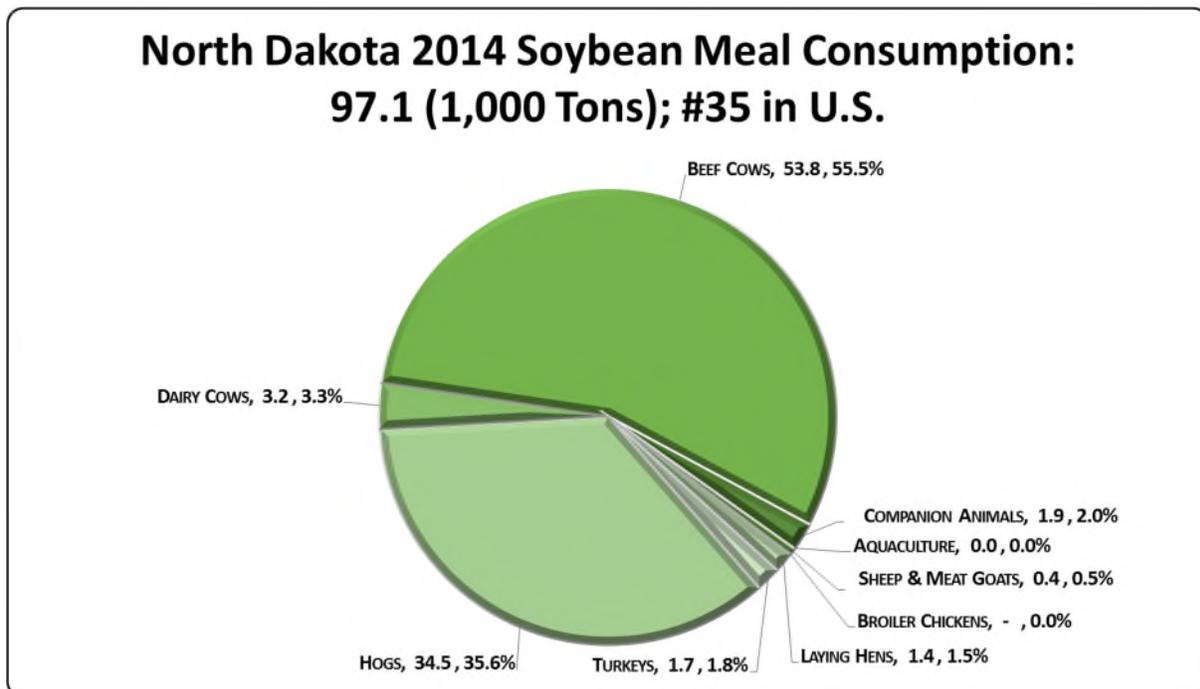
North Dakota Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation’s top nutritionists and researchers from both private industry and public institutions, “bottom up” estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

North Dakota’s animal agriculture consumed almost 97.1 thousand tons of soybean meal in 2014, placing the state as #35 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Beef Cows (53.8 thousand tons)
- Hogs (34.5 thousand tons)
- Dairy Cows (3.2 thousand tons)

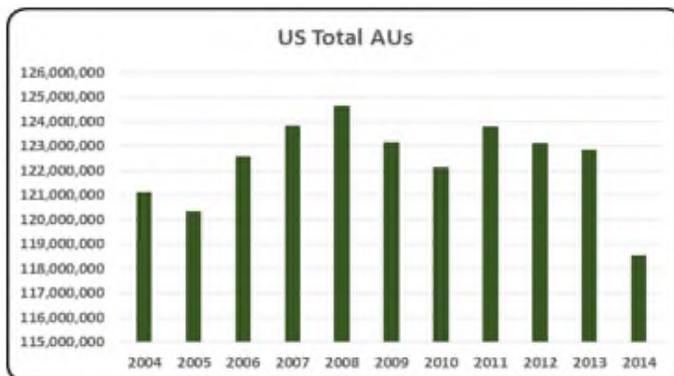


North Dakota Animal Unit (AU) Trends

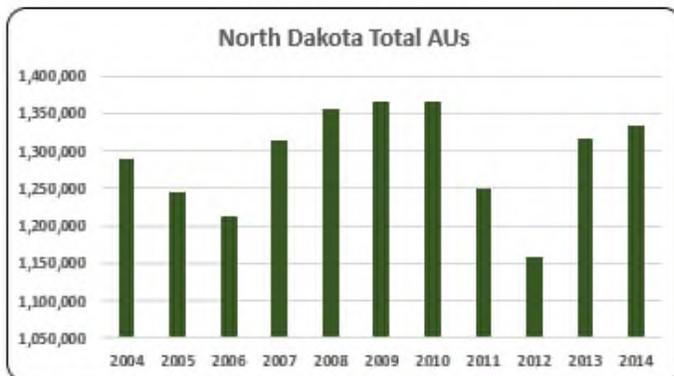
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of North Dakota. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to North Dakota and to give perspective on North Dakota’s contribution to the nation’s animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

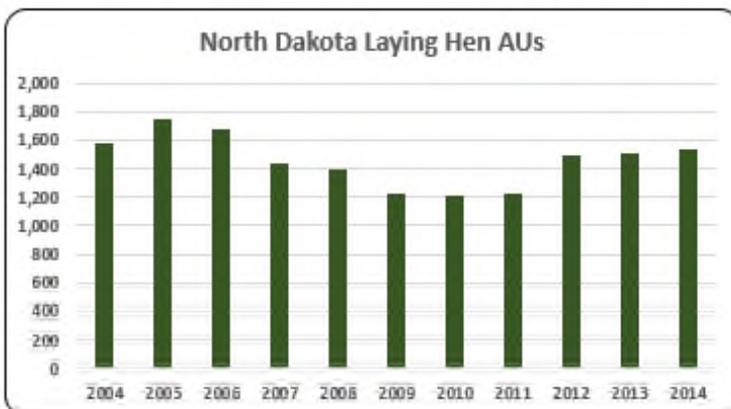
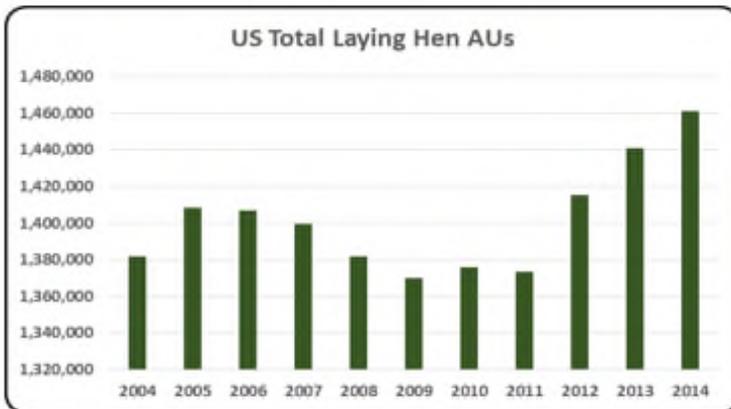
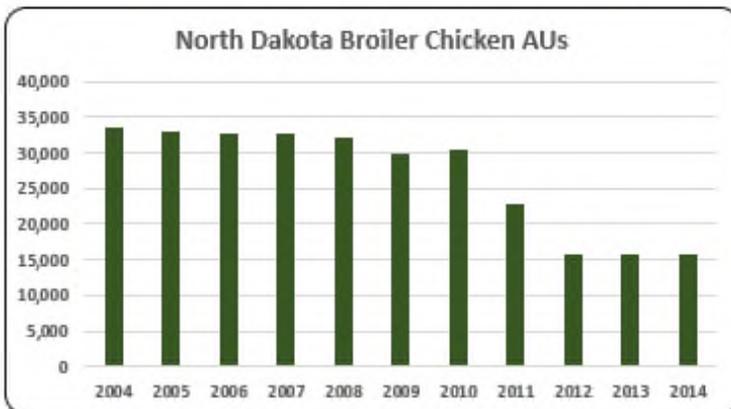
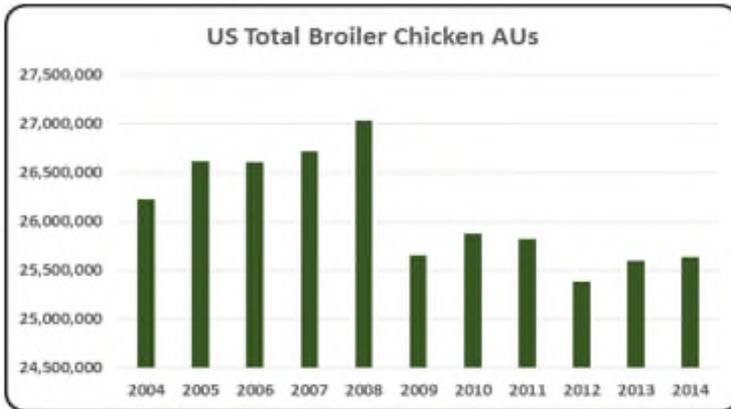
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In North Dakota, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (1,104.1 thousand AUs), Hogs (119.5 thousand AUs), and Turkeys (69.3 thousand AUs). Total animal units in North Dakota during 2014 were 1,334 thousand AUs.



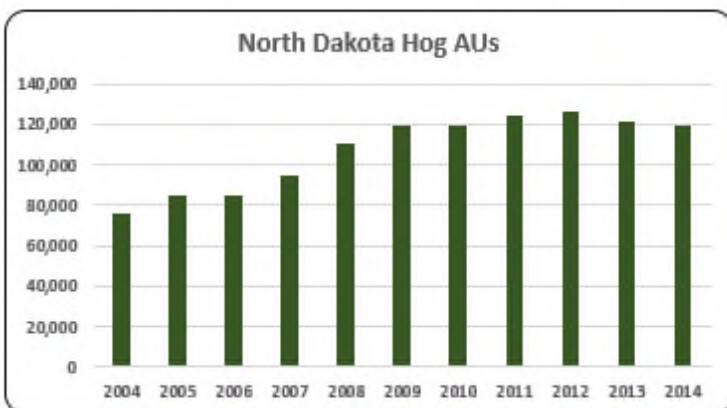
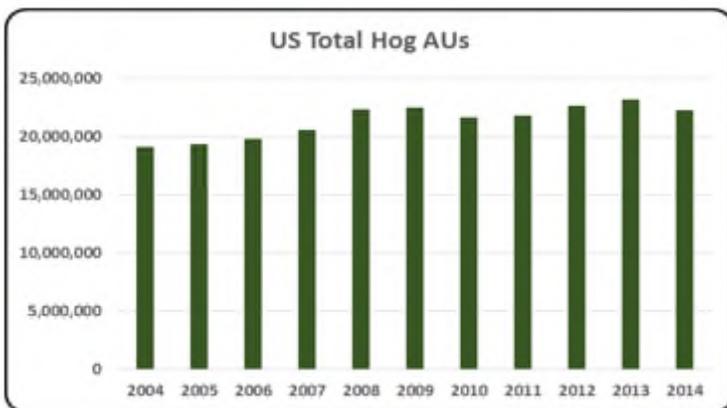
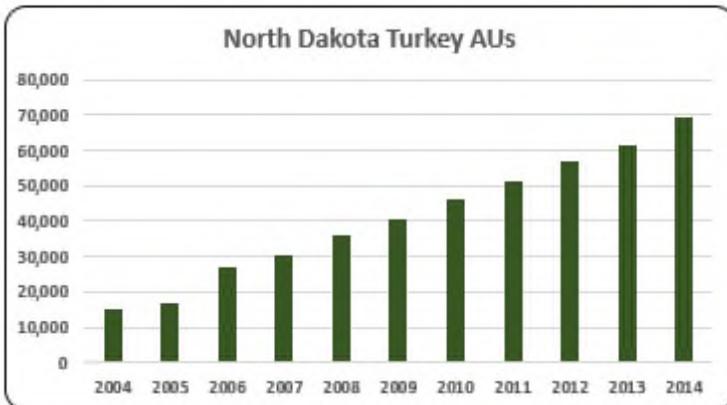
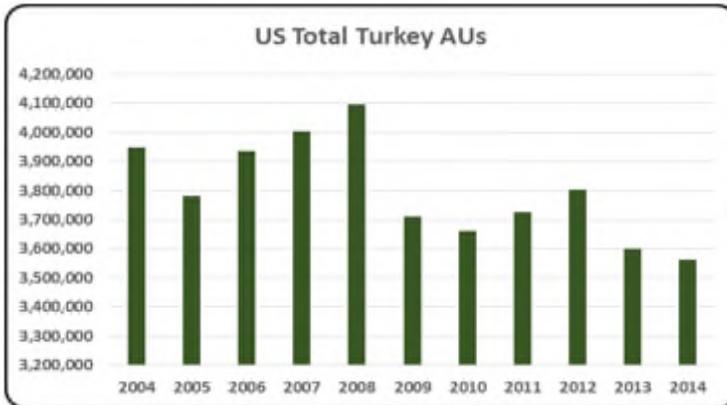
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



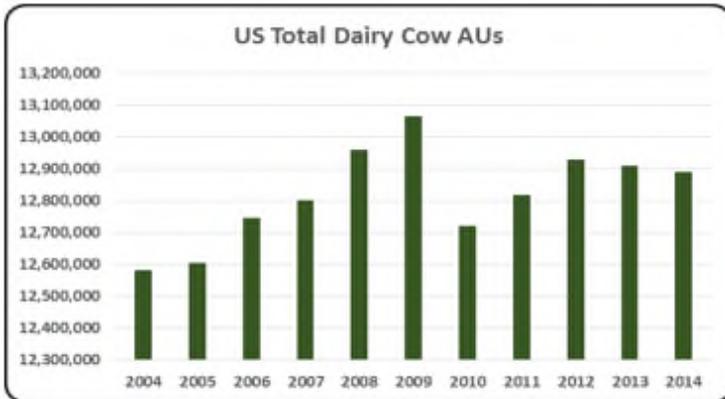
- About 1.13% (1,334.0 thousand) of all AUs in the U.S. were in North Dakota in 2014. Eighty three percent of all AUs in North Dakota were from beef cow production in 2014.



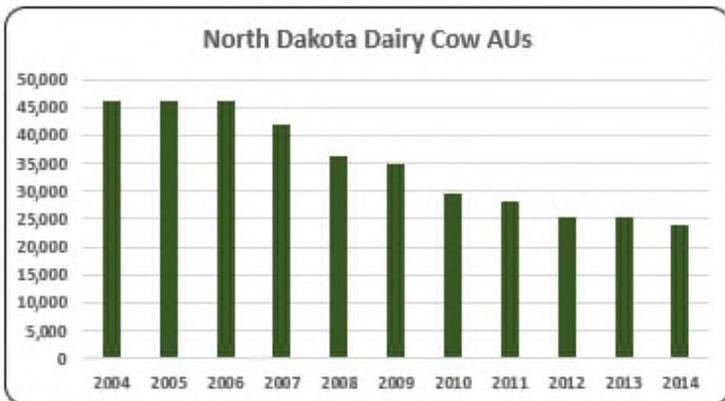
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production in North Dakota is the second smallest animal production in the state with 15,726 broiler AUs in 2014. There was a 53% reduction in broiler production from 2004 to 2014.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layer production in North Dakota was the smallest animal production in the state with only 1,536 layer AUs in 2014. Overall production declined 3% during the last decade.



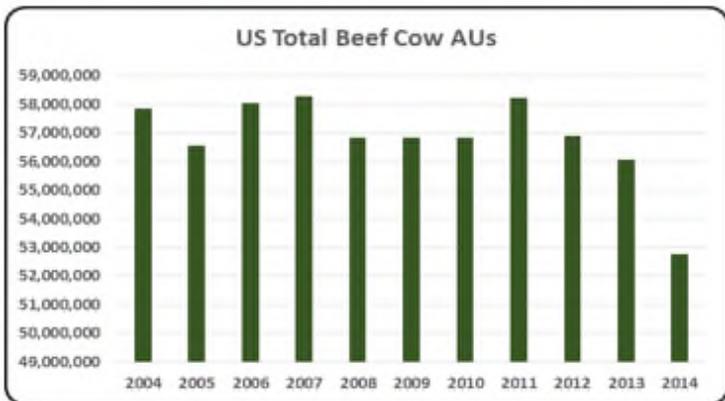
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production grew 22% in North Dakota from 2004 to 2014. Turkey production represented 5.19% (69,278 turkey AUs) of all animal production in the state in 2014. Turkey production increased 362% throughout the decade.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- There were 119,535 hog AUs in North Dakota in 2014. Hog numbers rose 58% from 75,690 in 2004 to 119,535 in 2014.



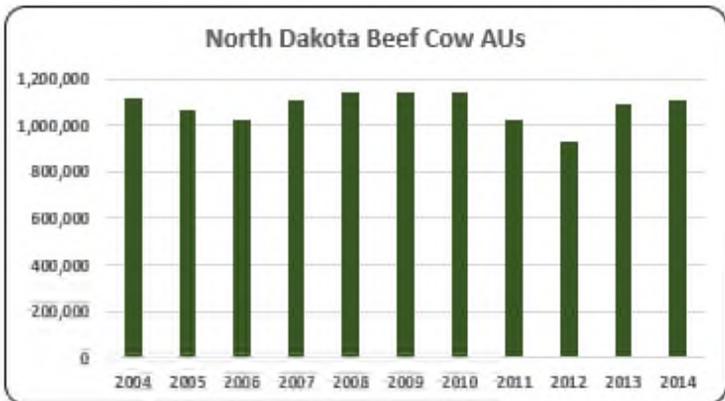
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production was less than 2% (23,800 dairy cow AUs) of all North Dakota AUs in 2014. Dairy cow production followed a downward trend since 2008.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production, the largest animal production in North Dakota, grew 1.2% to 1,104.1 thousand in 2014. The average beef cow AUs was 1,079.9 thousand from 2004 to 2014.

North Dakota Additional Information and Methodology

Animal agriculture is an important part of North Dakota's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in North Dakota, of interest is the degree to which the industry impacts the North Dakota economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for North Dakota animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted North Dakota's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in North Dakota which have occurred. As shown in this state report, North Dakota has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in North Dakota. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

North Dakota Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on North Dakota's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in North Dakota, \$1.897 to \$2.705 million in total economic activity, \$0.311 to \$0.429 in household wages and 8 to 11 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.7048 | \$ 0.4290 | 11.1 |
| | Hogs, Pigs, and Other | \$ 1.8966 | \$ 0.3107 | 8.0 |
| | Poultry and Eggs | \$ 2.4467 | \$ 0.3877 | 9.5 |
| | Dairy | \$ 2.1195 | \$ 0.3594 | 9.4 |

Appendix

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|-----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,116,450 | 1,063,950 | 1,019,325 | 1,111,575 | 1,139,025 | 1,139,025 | 1,139,025 | 1,021,125 | 933,765 | 1,091,460 | 1,104,090 |
| | Hog and Pig AUs | 75,690 | 84,300 | 84,360 | 95,115 | 110,685 | 119,580 | 119,010 | 124,425 | 126,015 | 121,155 | 119,535 |
| | Broiler AUs | 33,569 | 32,862 | 32,641 | 32,667 | 32,158 | 29,899 | 30,301 | 22,832 | 15,871 | 15,816 | 15,726 |
| | Turkey AUs | 15,000 | 16,587 | 27,149 | 30,198 | 36,233 | 40,589 | 45,934 | 51,270 | 56,678 | 61,552 | 69,278 |
| | Egg Layer AUs | 1,581 | 1,741 | 1,680 | 1,437 | 1,396 | 1,221 | 1,213 | 1,220 | 1,489 | 1,512 | 1,536 |
| | Dairy AUs | 46,200 | 46,200 | 46,200 | 42,000 | 36,400 | 35,000 | 29,400 | 28,000 | 25,200 | 25,200 | 23,800 |
| | Total Animal Units | 1,288,490 | 1,245,640 | 1,211,354 | 1,312,992 | 1,355,896 | 1,365,314 | 1,364,883 | 1,248,872 | 1,159,018 | 1,316,694 | 1,333,964 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 702,022 | \$ 761,799 | \$ 756,351 | \$ 599,566 | \$ 629,990 | \$ 490,746 | \$ 655,715 | \$ 780,087 | \$ 837,759 | \$ 857,342 | \$ 1,085,847 |
| | Hogs and Pigs (\$1,000) | \$ 38,804 | \$ 41,532 | \$ 37,696 | \$ 35,825 | \$ 35,474 | \$ 39,733 | \$ 51,177 | \$ 56,408 | \$ 46,692 | \$ 52,400 | \$ 66,738 |
| | Broilers (\$1,000) | \$ 28,234 | \$ 26,745 | \$ 20,668 | \$ 24,575 | \$ 25,292 | \$ 21,908 | \$ 23,059 | \$ 20,316 | \$ 15,810 | \$ 19,261 | \$ 20,205 |
| | Turkeys (\$1,000) | \$ 10,560 | \$ 10,989 | \$ 19,852 | \$ 23,056 | \$ 28,164 | \$ 31,362 | \$ 36,053 | \$ 40,638 | \$ 45,368 | \$ 49,444 | \$ 55,976 |
| | Eggs (\$1,000) | \$ 6,938 | \$ 4,200 | \$ 4,656 | \$ 7,643 | \$ 9,211 | \$ 6,556 | \$ 7,197 | \$ 7,890 | \$ 8,849 | \$ 9,998 | \$ 11,609 |
| | Milk (\$1,000) | \$ 85,738 | \$ 70,200 | \$ 58,750 | \$ 82,140 | \$ 77,330 | \$ 50,310 | \$ 61,056 | \$ 69,000 | \$ 65,583 | \$ 67,859 | \$ 76,464 |
| | Other | \$ 6,633 | \$ 6,678 | \$ 5,784 | \$ 5,482 | \$ 5,962 | \$ 5,795 | \$ 7,052 | \$ 6,151 | \$ 6,139 | \$ 6,127 | \$ 6,128 |
| | Sheep and Lambs (\$1,000) | \$ 6,524 | \$ 6,581 | \$ 5,699 | \$ 5,409 | \$ 5,901 | \$ 5,747 | \$ 7,016 | \$ 6,127 | \$ 6,127 | \$ 6,127 | \$ 6,128 |
| | Aquaculture (\$1,000) | \$ 109 | \$ 97 | \$ 85 | \$ 73 | \$ 61 | \$ 48 | \$ 36 | \$ 24 | \$ 12 | \$ - | \$ - |
| | Total (\$1,000) | \$ 878,929 | \$ 922,143 | \$ 903,757 | \$ 778,287 | \$ 811,422 | \$ 646,410 | \$ 841,309 | \$ 980,491 | \$ 1,026,200 | \$ 1,062,431 | \$ 1,322,968 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|----------------|----------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 7,600 | 7,154 | 5,961 | 4,949 | |
| | Cattle feedlots (112112) | 378 | 378 | 252 | 157 | |
| | Dairy cattle and milk production (11212) | 662 | 410 | 212 | 90 | |
| | Hog and pig farming (1122) | 207 | 90 | 74 | 66 | |
| | Poultry and egg production (1123) | 72 | 63 | 130 | 105 | |
| | Sheep and goat farming (1124) | 338 | 307 | 276 | 251 | |
| | Animal aquaculture and other animal production (1125,1129) | 871 | 1,147 | 1,415 | 2,085 | |
| Value of Sales (\$1,000) | Cattle and Calves | 499,719 | 625,070 | 856,489 | 1,063,287 | |
| | Hogs and Pigs | 34,861 | 25,888 | 34,910 | 50,366 | |
| | Poultry and Eggs | 27,371 | 22,365 | 28,496 | withheld | |
| | Milk and Other Dairy Products | 80,128 | 65,450 | 78,959 | 67,079 | |
| | Aquaculture | withheld | withheld | withheld | 738 | |
| | Other (calculated) | 36,135 | 34,221 | 46,843 | 61,862 | |
| | Total | 678,214 | 772,994 | 1,045,697 | 1,243,332 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 8,030 | 7,129 | 6,074 | 7,183 | |
| | | \$1,000 | 106,412 | 124,054 | 204,142 | 291,801 |
| | Breeding livestock purchased | (Farms) n/a | 5,406 | 4,901 | 5,772 | |
| | | \$1,000 | n/a | 31,117 | 59,706 | 101,420 |
| | Other livestock and poultry purchased | (Farms) n/a | 2,841 | 2,022 | 2,666 | |
| | | \$1,000 | n/a | 92,937 | 144,436 | 190,381 |
| Feed purchased | (Farms) | 12,996 | 11,956 | 9,597 | 11,830 | |
| | \$1,000 | 125,867 | 118,559 | 158,337 | 324,796 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|---------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 2,936,999 | \$ 465,828 | 12,002 | \$ 107,839 |
| | Hogs, Pigs, and Other | \$ 138,197 | \$ 22,639 | 580 | \$ 5,241 |
| | Poultry and Eggs | \$ 214,798 | \$ 34,037 | 838 | \$ 7,879 |
| | Dairy | \$ 162,065 | \$ 27,481 | 719 | \$ 6,362 |
| | Total | \$ 3,452,060 | \$ 549,985 | 14,139 | \$ 127,322 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 557,321 | \$ 88,395 | 2,277 | \$ 20,463 |
| | Hogs, Pigs, and Other | \$ 30,199 | \$ 4,947 | 127 | \$ 1,145 |
| | Poultry and Eggs | \$ 74,569 | \$ 11,816 | 291 | \$ 2,735 |
| | Dairy | \$ (65,674) | \$ (11,136) | (291) | \$ (2,578) |
| | Total | \$ 596,415 | \$ 94,022 | 2,404 | \$ 21,766 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.7048 | \$ 0.4290 | 11.1 | |
| | Hogs, Pigs, and Other | \$ 1.8966 | \$ 0.3107 | 8.0 | |
| | Poultry and Eggs | \$ 2.4467 | \$ 0.3877 | 9.5 | |
| | Dairy | \$ 2.1195 | \$ 0.3594 | 9.4 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 2.8% | |
| | Total | | | 23.2% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: OHIO

Ohio Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Ohio's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Ohio. The success of Ohio animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Ohio during 2014 animal agriculture contributed:

- \$9.3 billion in economic output
- 52,927 jobs
- \$1.7 billion in earnings
- \$407.3 million in income taxes paid at local, state, and federal levels
- \$235.7 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Ohio increased economic output by over \$3.4 billion, boosted household earnings by \$615.5 million, contributed 19,308 additional jobs and paid \$150.4 million in additional tax revenues.

Ohio's animal agriculture consumed about 778.4 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (222.4 thousand tons)
- Dairy Cows (203.7 thousand tons)
- Egg-Laying Hens (188.8 thousand tons)

This report examines animal agriculture in Ohio over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Ohio, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Ohio and beyond.

Ohio Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Ohio's economy. In 2014, Ohio's animal agriculture contributed the following to the economy:

- About \$9.3 billion in economic output
- \$1.7 billion in household earnings
- 52,927 jobs
- \$407.3 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Ohio's animal agriculture has:

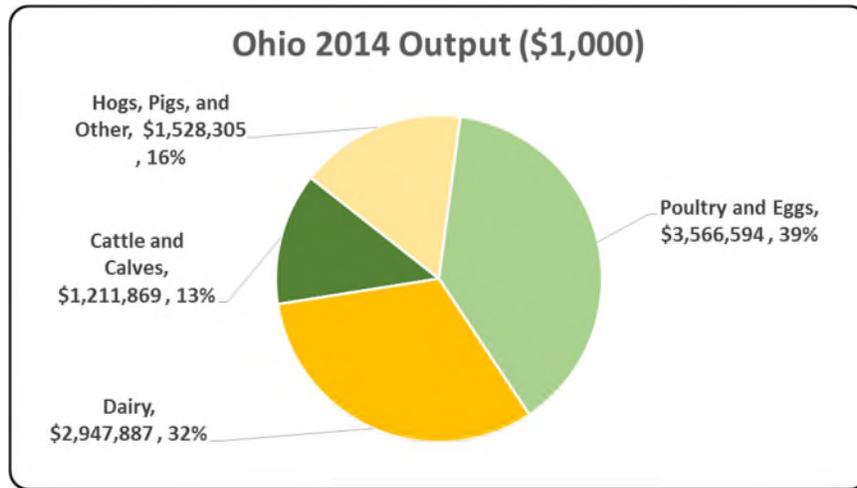
- Increased economic output by \$3.4 billion
- Boosted household earnings by \$615.5 million
- Added 19,308 jobs
- Paid an additional \$150.4 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 9,254,656 | \$ 3,426,311 | 58.79% |
| Earnings (\$1,000) | \$ 1,666,478 | \$ 615,527 | 58.57% |
| Employment (Jobs) | 52,927 | 19,308 | 57.43% |
| Income Taxes Paid (\$1,000) | \$ 407,271 | \$ 150,429 | 58.57% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 235,741 | | |

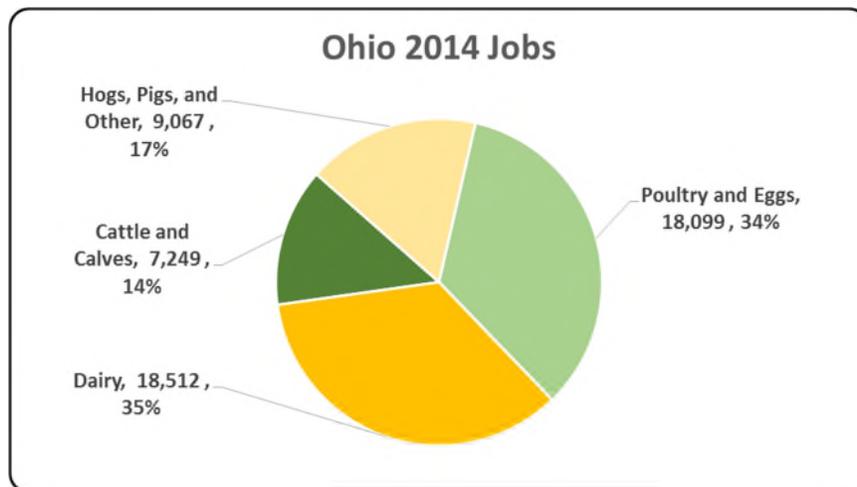
Ohio Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Ohio economy. Animal agriculture’s impact on Ohio total economic output is about \$9.3 billion.



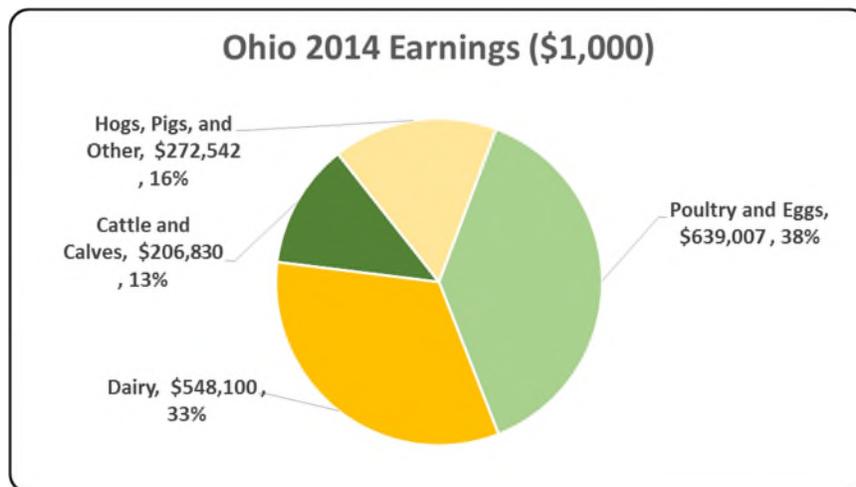
Ohio Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Ohio in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Ohio total jobs, contributing 52,927 jobs within and outside of animal agriculture.



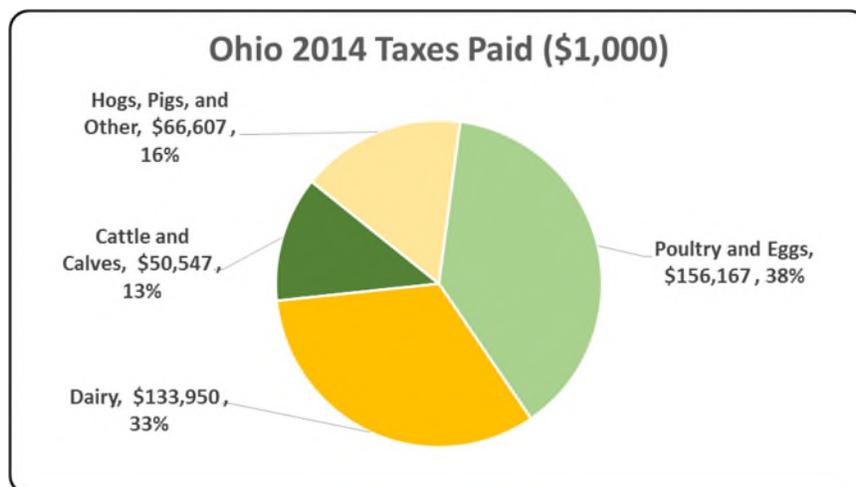
Ohio Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Ohio economy in terms of earnings. Ohio's animal agriculture contributed about \$1.7 billion to household earnings in 2014.



Ohio Taxes Paid by Animal Agriculture

Ohio's animal agriculture is also a significant source of tax revenue. In 2014, the state's animal agriculture industry paid about \$407.3 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$235.7 million in property taxes paid by all of Ohio agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



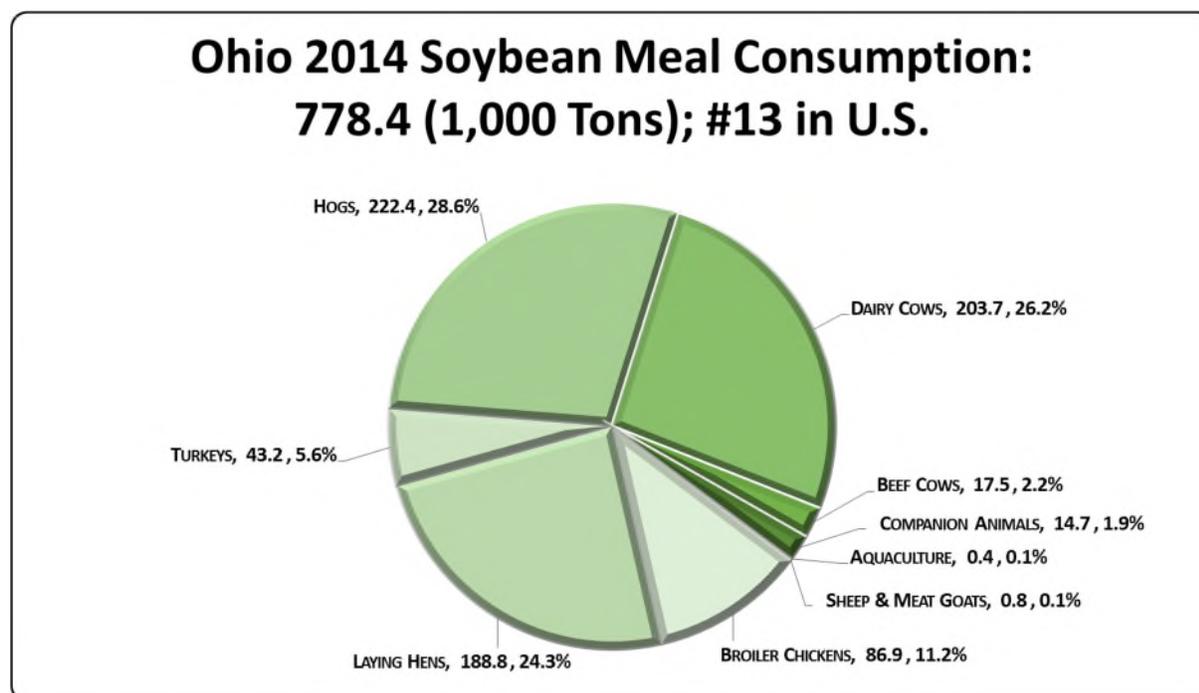
Ohio Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Ohio's animal agriculture consumed almost 778.4 thousand tons of soybean meal in 2014, placing the state as #13 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (222.4 thousand tons)
- Dairy Cows (203.7 thousand tons)
- Egg-Laying Hens (188.8 thousand tons)

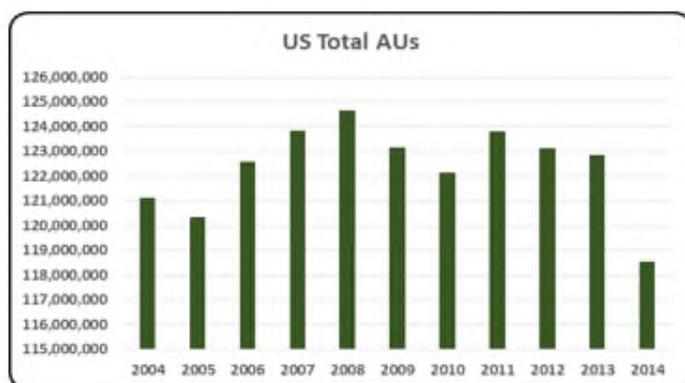


Ohio Animal Unit (AU) Trends

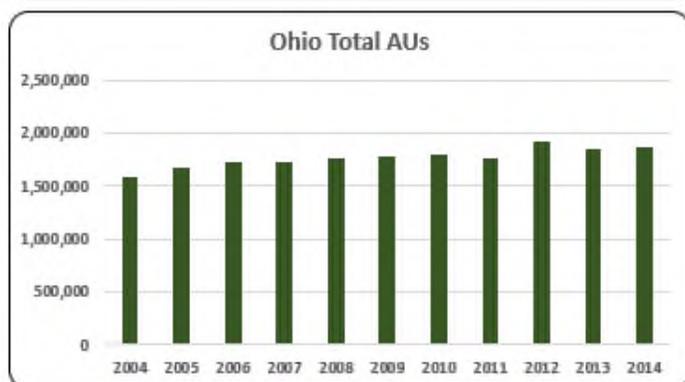
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Ohio. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Ohio and to give perspective on Ohio's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

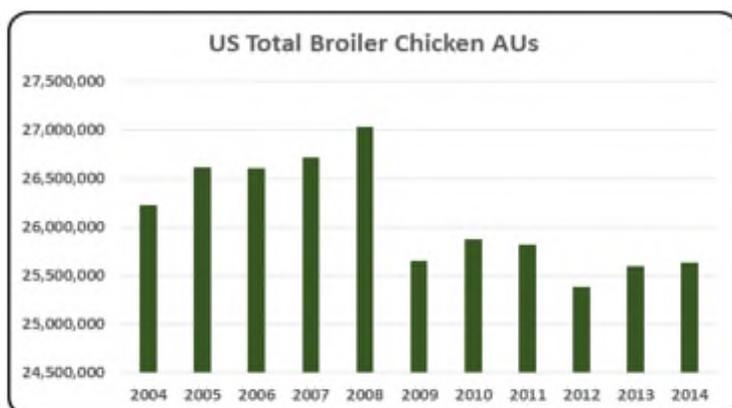
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Ohio, the largest three segments of animal agriculture in terms of AUs during 2014 were: Hogs (603.6 thousand AUs), Beef Cows (466.8 thousand AUs), and Dairy Cows (373.8 thousand AUs). Total animal units in Ohio during 2014 were 1,872.1 thousand AUs.



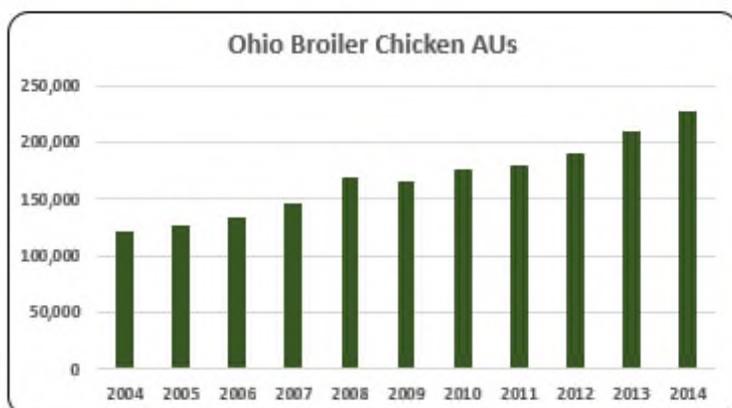
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



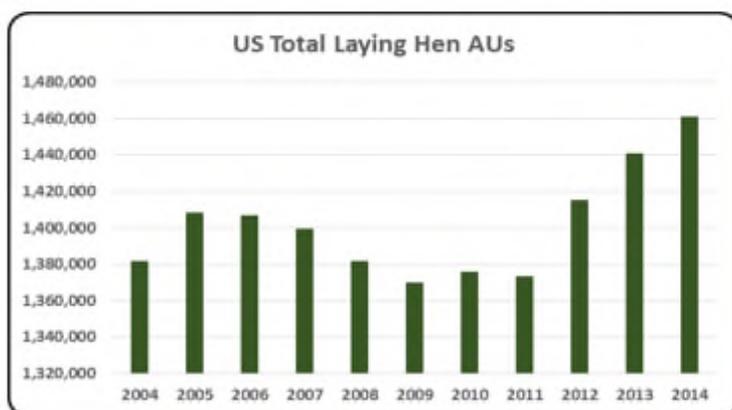
- About 1.6% (1,872.1 thousand) of all AUs in the U.S. were in Ohio in 2014. Layer production represented 6.63% (124,173 layer AUs) of all AUs in the state and 8.50% of all layer AUs in the U.S.



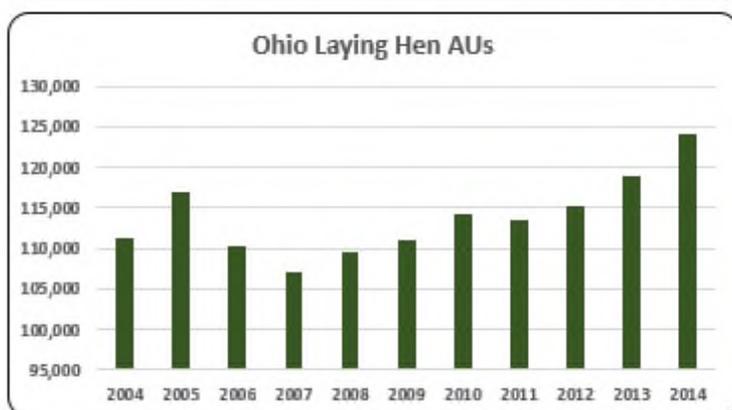
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



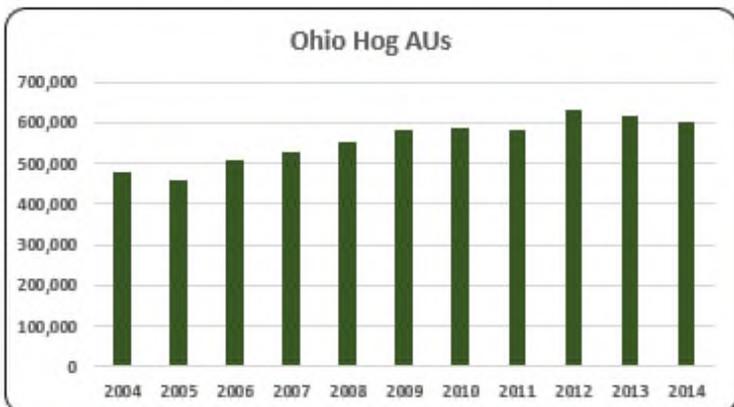
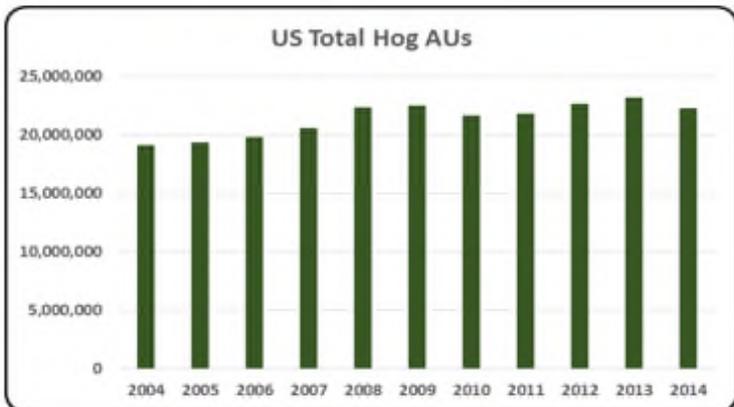
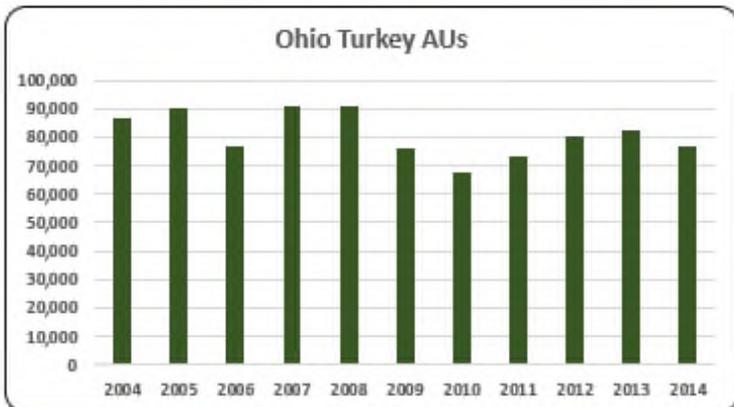
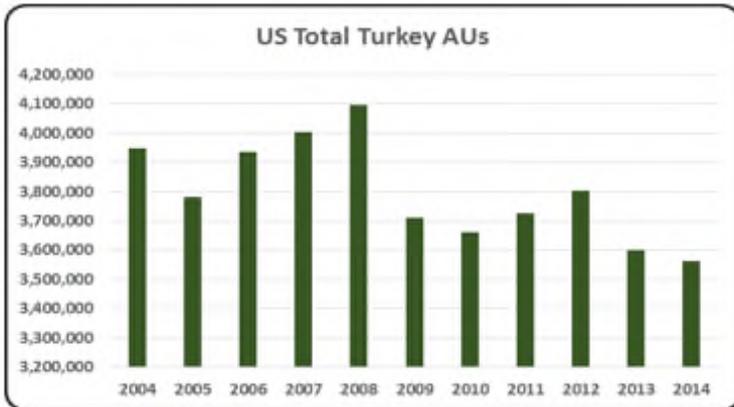
- There were 227,218 broiler AUs in Ohio in 2014. Broiler production climbed 86.6% from 2004 to 2014.



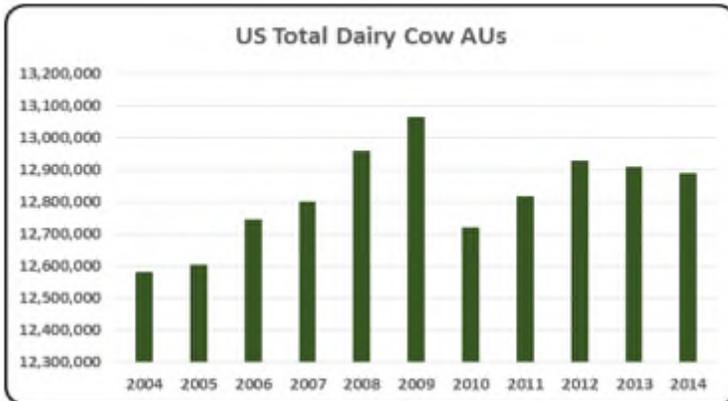
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



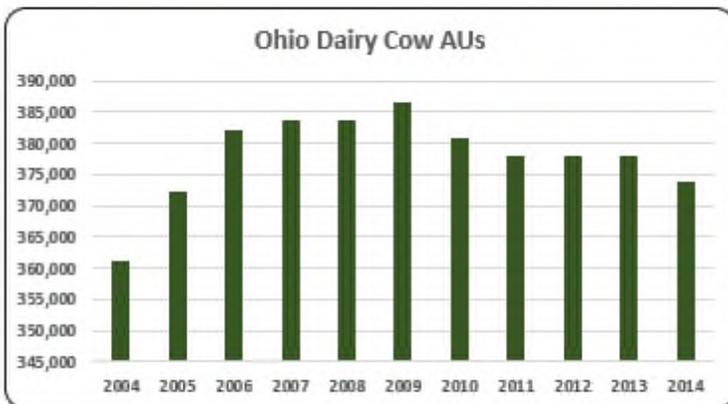
- In 2014 Ohio was the second largest producer of eggs in the U.S. supplying 8.8% of the country's total egg production. There were 124,173 layer AUs in 2014. Layer production increased 4.4% year-over-year and the industry has grown 12% since 2004.



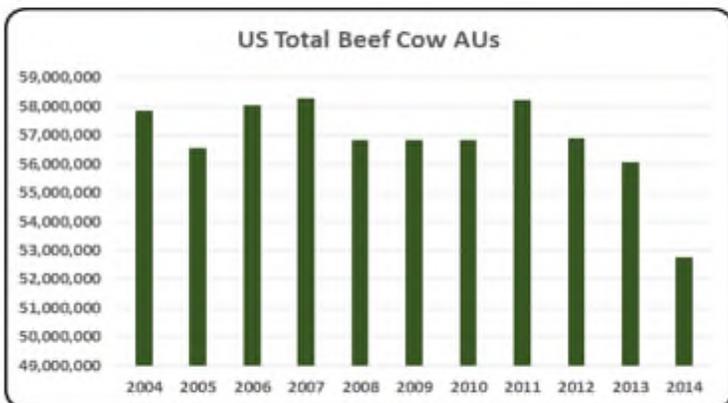
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- The average number of turkey AUs in Ohio during the last decade was 81,042. Turkey production declined 12% from 87,000 turkey AUs in 2004 to 76,475 turkey AUs in 2014.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Pork production is the largest animal production in Ohio. In 2014, 32.24% (603,600 hog AUs) came from hog AUs.



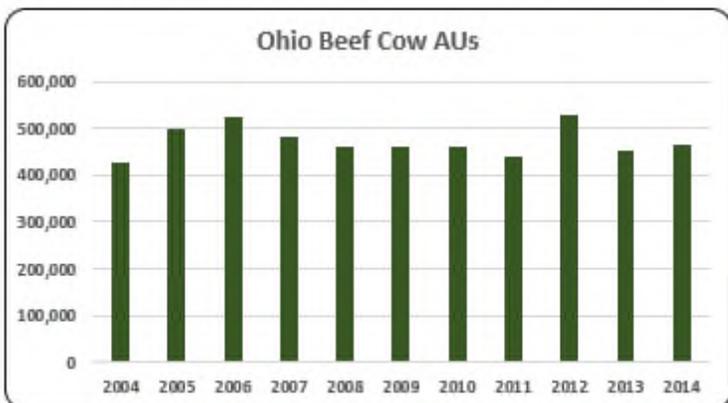
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Twenty percent (373,800 dairy cow AUs) of AUs in Ohio in 2014 were dairy cows. In 2014 dairy cow AUs declined 1.1% relative to previous year. 2009 was a record high (386,400 AUs) for the dairy cow industry in Ohio.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- The average number of beef cow AUs was 473,114 from 2004 to 2014. Beef cow production climbed 9.0% since the start of the decade.

Ohio Additional Information and Methodology

Animal agriculture is an important part of Ohio's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Ohio, of interest is the degree to which the industry impacts the Ohio economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Ohio animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Ohio's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Ohio which have occurred. As shown in this state report, Ohio has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Ohio. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Ohio Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Ohio's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Ohio, \$1.949 to \$3.042 million in total economic activity, \$0.338 to \$0.545 in household wages and 12 to 15 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.9816 | \$ 0.3382 | 11.9 |
| | Hogs, Pigs, and Other | \$ 1.9492 | \$ 0.3476 | 11.6 |
| | Poultry and Eggs | \$ 3.0419 | \$ 0.5450 | 15.4 |
| | Dairy | \$ 2.2089 | \$ 0.4107 | 13.9 |

Appendix

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 428,550 | 499,050 | 523,500 | 481,200 | 461,400 | 461,400 | 461,400 | 439,800 | 529,050 | 452,100 | 466,800 |
| | Hog and Pig AUs | 477,900 | 459,750 | 505,500 | 525,150 | 554,250 | 580,650 | 589,200 | 584,100 | 633,150 | 615,600 | 603,600 |
| | Broiler AUs | 121,790 | 126,994 | 134,326 | 146,465 | 169,544 | 165,952 | 176,568 | 179,070 | 189,966 | 209,794 | 227,218 |
| | Turkey AUs | 87,000 | 90,475 | 76,922 | 90,595 | 90,583 | 76,197 | 67,292 | 73,034 | 80,343 | 82,552 | 76,475 |
| | Egg Layer AUs | 111,356 | 116,868 | 110,176 | 107,000 | 109,624 | 111,108 | 114,200 | 113,436 | 115,082 | 118,942 | 124,173 |
| | Dairy AUs | 361,200 | 372,400 | 382,200 | 383,600 | 383,600 | 386,400 | 380,800 | 378,000 | 378,000 | 378,000 | 373,800 |
| | Total Animal Units | 1,587,796 | 1,665,537 | 1,732,623 | 1,734,010 | 1,769,001 | 1,781,706 | 1,789,460 | 1,767,440 | 1,925,591 | 1,856,989 | 1,872,067 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 316,374 | \$ 369,900 | \$ 374,089 | \$ 380,827 | \$ 371,612 | \$ 303,704 | \$ 380,804 | \$ 411,199 | \$ 522,424 | \$ 495,967 | \$ 611,561 |
| | Hogs and Pigs (\$1,000) | \$ 372,171 | \$ 393,142 | \$ 383,445 | \$ 390,400 | \$ 420,245 | \$ 392,245 | \$ 553,136 | \$ 695,683 | \$ 671,567 | \$ 720,787 | \$ 767,231 |
| | Broilers (\$1,000) | \$ 101,070 | \$ 100,496 | \$ 87,012 | \$ 117,777 | \$ 150,788 | \$ 154,649 | \$ 181,618 | \$ 172,355 | \$ 189,600 | \$ 245,714 | \$ 274,483 |
| | Turkeys (\$1,000) | \$ 92,324 | \$ 98,472 | \$ 87,740 | \$ 104,604 | \$ 133,632 | \$ 105,726 | \$ 119,499 | \$ 137,082 | \$ 156,637 | \$ 155,031 | \$ 153,689 |
| | Eggs (\$1,000) | \$ 333,750 | \$ 228,182 | \$ 287,198 | \$ 483,441 | \$ 585,477 | \$ 403,793 | \$ 427,361 | \$ 486,185 | \$ 523,315 | \$ 587,562 | \$ 744,317 |
| | Milk (\$1,000) | \$ 756,960 | \$ 749,394 | \$ 670,680 | \$ 991,020 | \$ 1,010,610 | \$ 732,072 | \$ 938,060 | \$ 1,116,248 | \$ 1,038,870 | \$ 1,154,976 | \$ 1,334,550 |
| | Other | \$ 11,651 | \$ 14,055 | \$ 13,973 | \$ 12,807 | \$ 13,844 | \$ 13,898 | \$ 15,932 | \$ 15,508 | \$ 15,951 | \$ 16,394 | \$ 16,837 |
| | Sheep and Lambs (\$1,000) | \$ 8,663 | \$ 10,870 | \$ 10,591 | \$ 9,229 | \$ 10,069 | \$ 9,926 | \$ 11,764 | \$ 11,144 | \$ 11,390 | \$ 11,636 | \$ 11,882 |
| | Aquaculture (\$1,000) | \$ 2,988 | \$ 3,185 | \$ 3,382 | \$ 3,578 | \$ 3,775 | \$ 3,972 | \$ 4,168 | \$ 4,365 | \$ 4,561 | \$ 4,758 | \$ 4,955 |
| | Total (\$1,000) | \$ 1,984,300 | \$ 1,953,641 | \$ 1,904,137 | \$ 2,480,876 | \$ 2,686,208 | \$ 2,106,087 | \$ 2,616,410 | \$ 3,034,260 | \$ 3,118,364 | \$ 3,376,431 | \$ 3,902,668 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 10,951 | 10,526 | 12,297 | 11,445 | |
| | Cattle feedlots (112112) | 2,793 | 4,191 | 1,890 | 548 | |
| | Dairy cattle and milk production (11212) | 3,826 | 3,771 | 2,955 | 2,850 | |
| | Hog and pig farming (1122) | 2,456 | 1,781 | 1,594 | 1,170 | |
| | Poultry and egg production (1123) | 828 | 1,000 | 1,650 | 1,472 | |
| | Sheep and goat farming (1124) | 1,292 | 1,932 | 2,227 | 2,188 | |
| | Animal aquaculture and other animal production (1125,1129) | 4,137 | 9,357 | 7,195 | 8,071 | |
| Value of Sales (\$1,000) | Cattle and Calves | 360,769 | 408,242 | 565,746 | 689,655 | |
| | Hogs and Pigs | 363,586 | 322,687 | 571,685 | 788,761 | |
| | Poultry and Eggs | 575,438 | 604,808 | 883,301 | 946,592 | |
| | Milk and Other Dairy Products | 505,128 | 551,877 | 861,632 | 938,266 | |
| | Aquaculture | 1,788 | 3,338 | 6,582 | 3,875 | |
| | Other (calculated) | 66,720 | 67,702 | 71,544 | 51,921 | |
| | Total | 1,873,429 | 1,958,654 | 2,960,490 | 3,419,070 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 18,692 | 19,791 | 16,523 | 19,332 |
| | | \$1,000 | 267,858 | 269,910 | 538,127 | 473,494 |
| | Breeding livestock purchased | (Farms) | n/a | 9,275 | 7,668 | 9,355 |
| | | \$1,000 | n/a | 37,335 | 78,925 | 102,128 |
| | Other livestock and poultry purchased | (Farms) | n/a | 13,139 | 11,055 | 12,880 |
| | | \$1,000 | n/a | 232,575 | 459,202 | 371,366 |
| Feed purchased | (Farms) | 31,975 | 40,506 | 34,423 | 38,782 | |
| | \$1,000 | 713,397 | 648,768 | 959,439 | 1,521,609 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,211,869 | \$ 206,830 | 7,249 | \$ 50,547 |
| | Hogs, Pigs, and Other | \$ 1,528,305 | \$ 272,542 | 9,067 | \$ 66,607 |
| | Poultry and Eggs | \$ 3,566,594 | \$ 639,007 | 18,099 | \$ 156,167 |
| | Dairy | \$ 2,947,887 | \$ 548,100 | 18,512 | \$ 133,950 |
| | Total | \$ 9,254,656 | \$ 1,666,478 | 52,927 | \$ 407,271 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 426,183 | \$ 72,737 | 2,549 | \$ 17,776 |
| | Hogs, Pigs, and Other | \$ 590,702 | \$ 105,340 | 3,505 | \$ 25,744 |
| | Poultry and Eggs | \$ 1,557,009 | \$ 278,960 | 7,901 | \$ 68,175 |
| | Dairy | \$ 852,418 | \$ 158,490 | 5,353 | \$ 38,733 |
| | Total | \$ 3,426,311 | \$ 615,527 | 19,308 | \$ 150,429 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.9816 | \$ 0.3382 | 11.9 | |
| | Hogs, Pigs, and Other | \$ 1.9492 | \$ 0.3476 | 11.6 | |
| | Poultry and Eggs | \$ 3.0419 | \$ 0.5450 | 15.4 | |
| | Dairy | \$ 2.2089 | \$ 0.4107 | 13.9 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 4.1% |
| | Total | | | | 24.4% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: OKLAHOMA

Oklahoma Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Oklahoma's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Oklahoma. The success of Oklahoma animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Oklahoma during 2014 animal agriculture contributed:

- \$14.6 billion in economic output
- 94,529 jobs
- \$2.5 billion in earnings
- \$634.7 million in income taxes paid at local, state, and federal levels
- \$114.3 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Oklahoma increased economic output by over \$3.4 billion, boosted household earnings by \$566.4 million, contributed 21,585 additional jobs and paid \$144.9 million in additional tax revenues.

Oklahoma's animal agriculture consumed about 721.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (396.9 thousand tons)
- Broilers (241.8 thousand tons)
- Beef Cows (48.6 thousand tons)

This report examines animal agriculture in Oklahoma over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Oklahoma, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Oklahoma and beyond.

Oklahoma Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Oklahoma's economy. In 2014, Oklahoma's animal agriculture contributed the following to the economy:

- About \$14.6 billion in economic output
- \$2.5 billion in household earnings
- 94,529 jobs
- \$634.7 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Oklahoma's animal agriculture has:

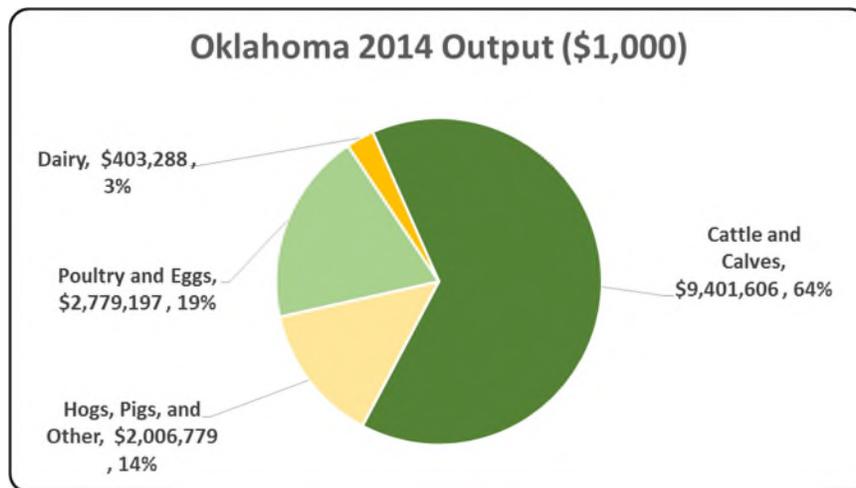
- Increased economic output by \$3.4 billion
- Boosted household earnings by \$566.4 million
- Added 21,585 jobs
- Paid an additional \$144.9 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 14,590,870 | \$ 3,351,381 | 29.82% |
| Earnings (\$1,000) | \$ 2,481,261 | \$ 566,437 | 29.58% |
| Employment (Jobs) | 94,529 | 21,585 | 29.59% |
| Income Taxes Paid (\$1,000) | \$ 634,706 | \$ 144,895 | 29.58% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 114,320 | | |

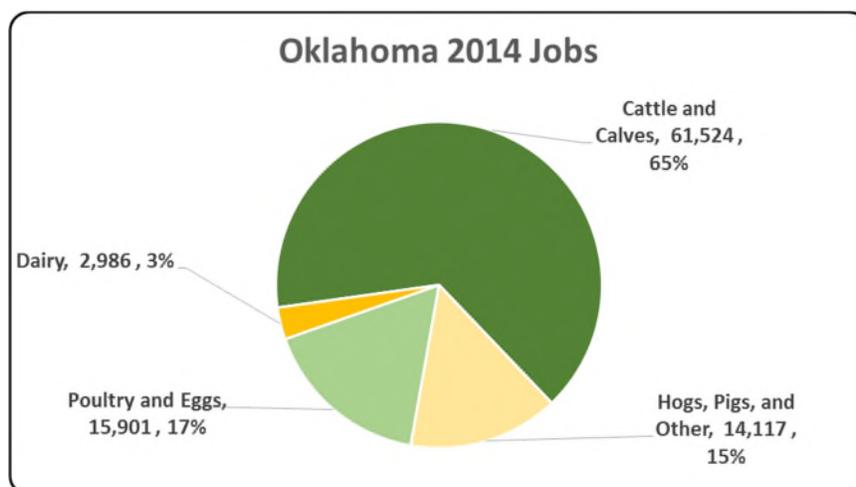
Oklahoma Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Oklahoma economy. Animal agriculture’s impact on Oklahoma total economic output is about \$14.6 billion.



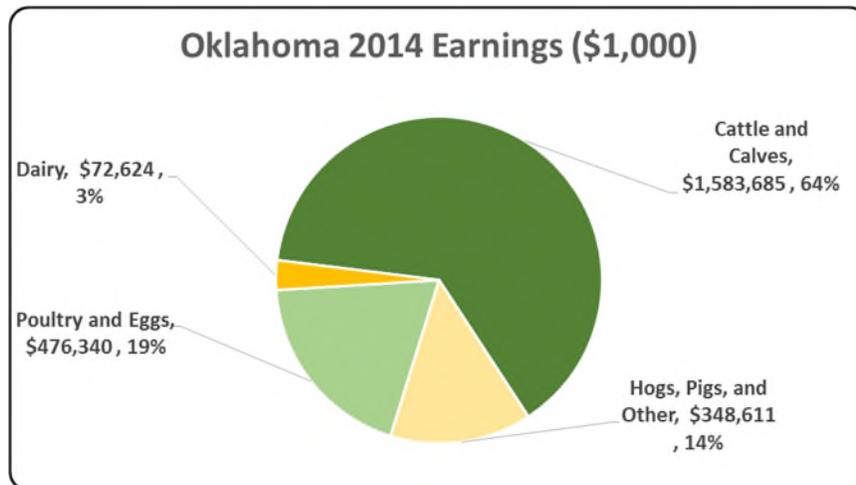
Oklahoma Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Oklahoma in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Oklahoma total jobs, contributing 94,529 jobs within and outside of animal agriculture.



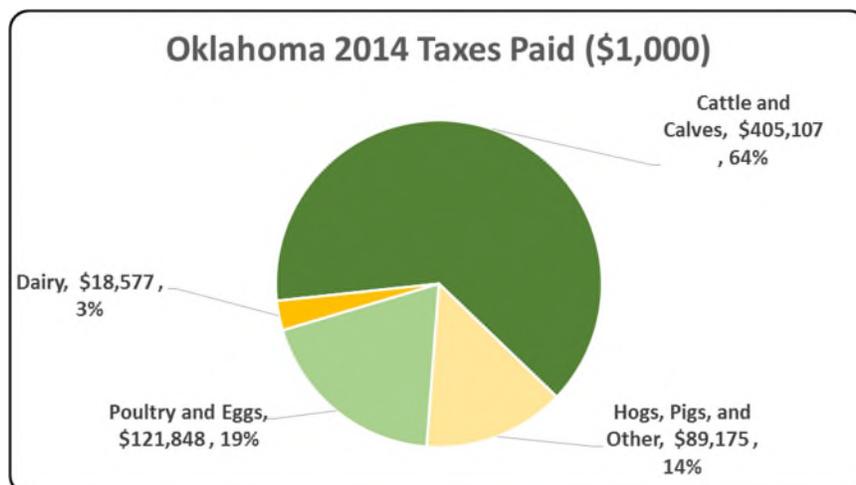
Oklahoma Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Oklahoma economy in terms of earnings. Oklahoma's animal agriculture contributed about \$2.5 billion to household earnings in 2014.



Oklahoma Taxes Paid by Animal Agriculture

Oklahoma's animal agriculture is also a significant source of tax revenue. In 2014, the state's animal agriculture industry paid about \$634.7 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$114.3 million in property taxes paid by all of Oklahoma agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



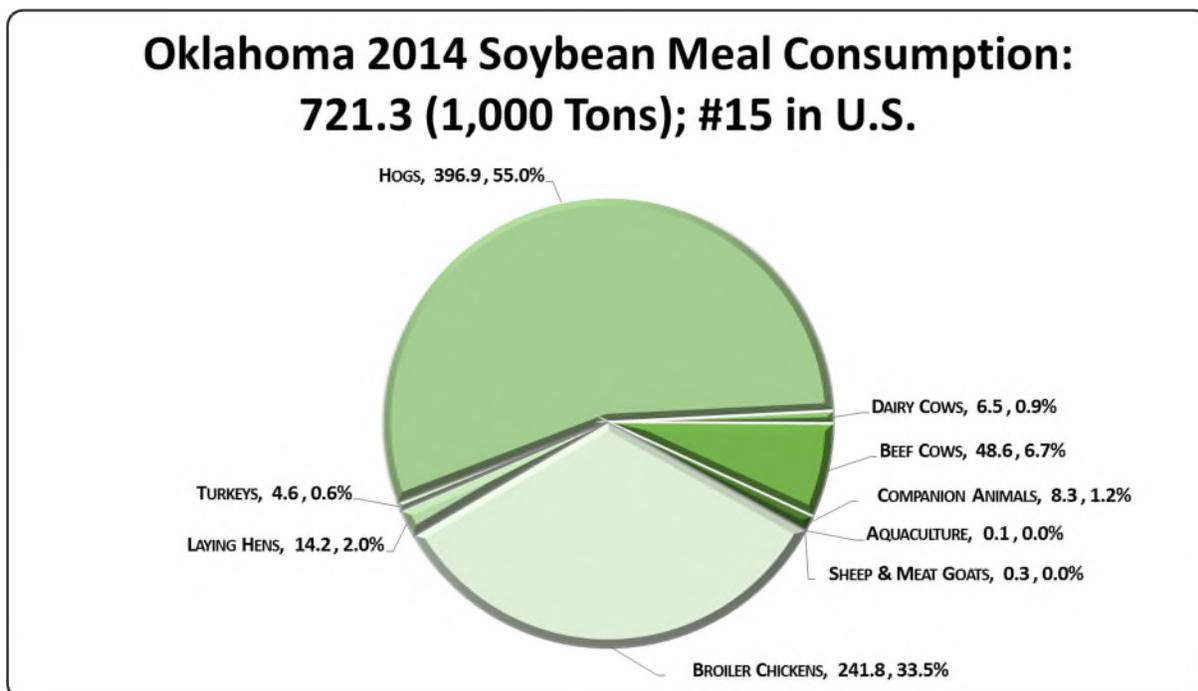
Oklahoma Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Oklahoma's animal agriculture consumed almost 721.3 thousand tons of soybean meal in 2014, placing the state as #15 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (396.9 thousand tons)
- Broilers (241.8 thousand tons)
- Beef Cows (48.6 thousand tons)

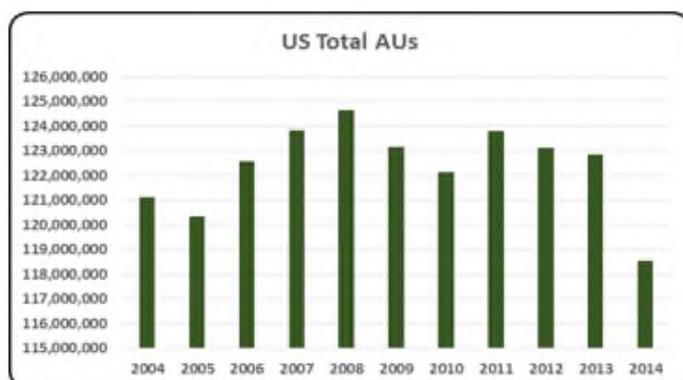


Oklahoma Animal Unit (AU) Trends

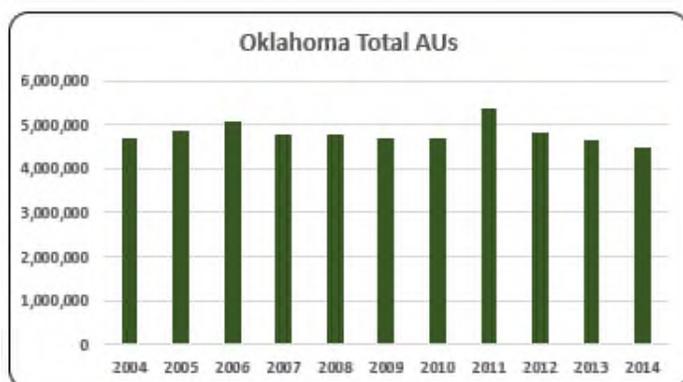
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Oklahoma. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Oklahoma and to give perspective on Oklahoma's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

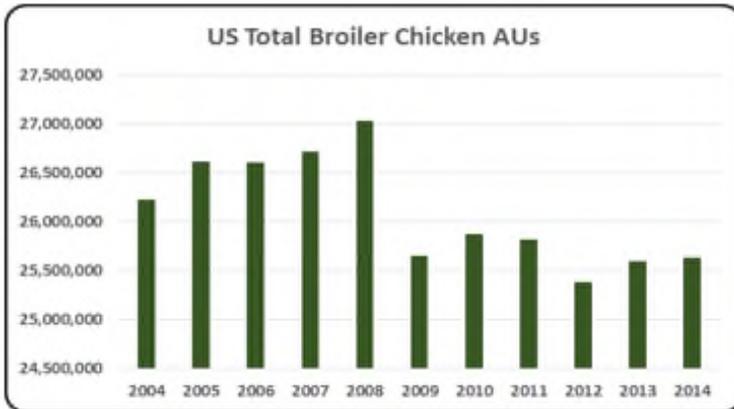
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Oklahoma, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (2,644.5 thousand AUs), Hogs (1,113.8 thousand AUs), and Broilers (617.0 thousand AUs). Total animal units in Oklahoma during 2014 were 4,458.9 thousand AUs.



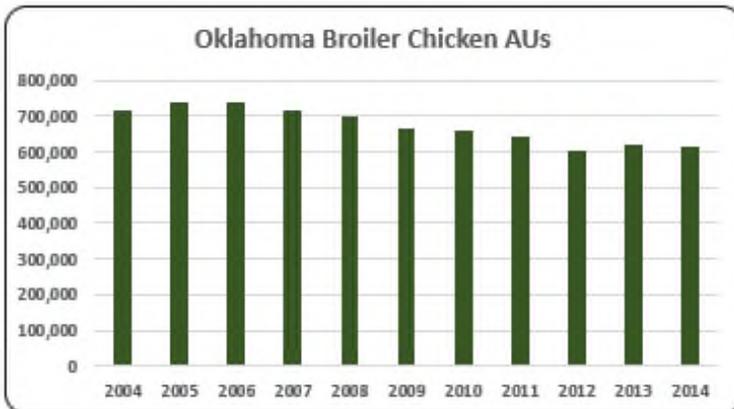
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



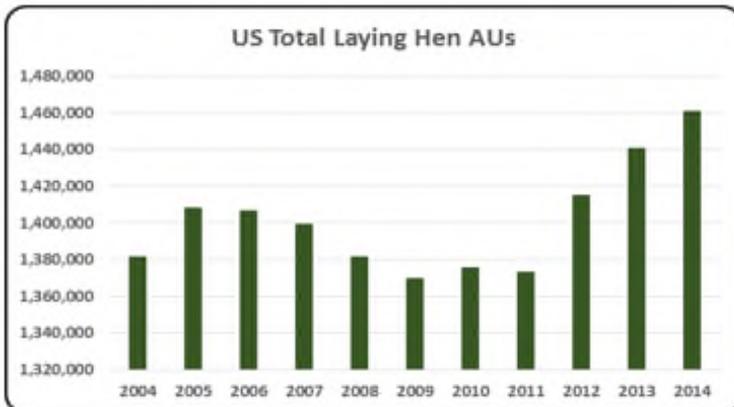
- There were 4,458.9 thousand AUs in Oklahoma in 2014 representing 3.8% of all AUs in the country. 2011 was a record year for animal production with 5,384.3 thousand. Overall, Oklahoma AUs fell 5.3% during last decade.



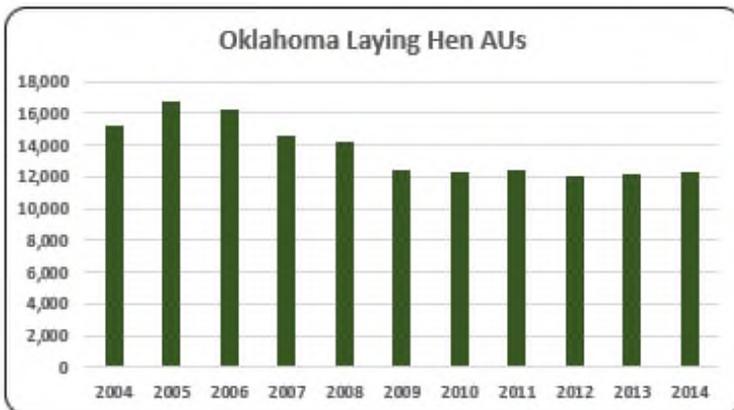
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



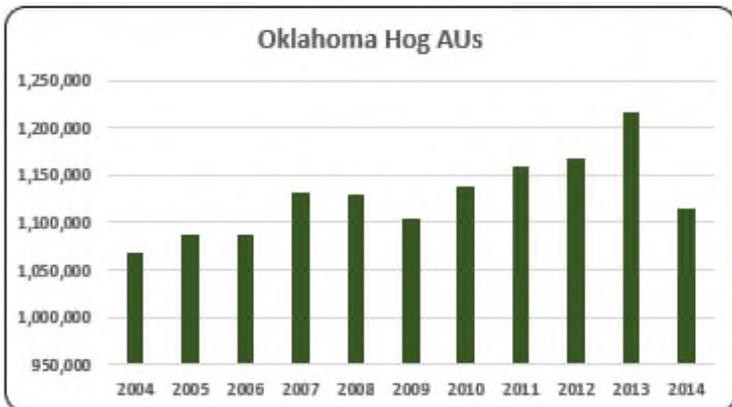
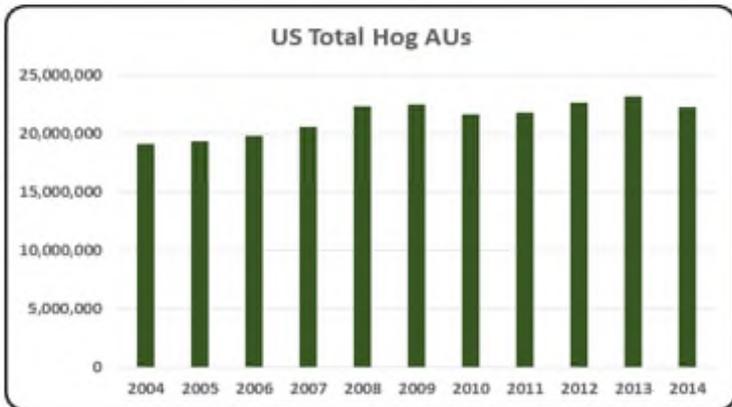
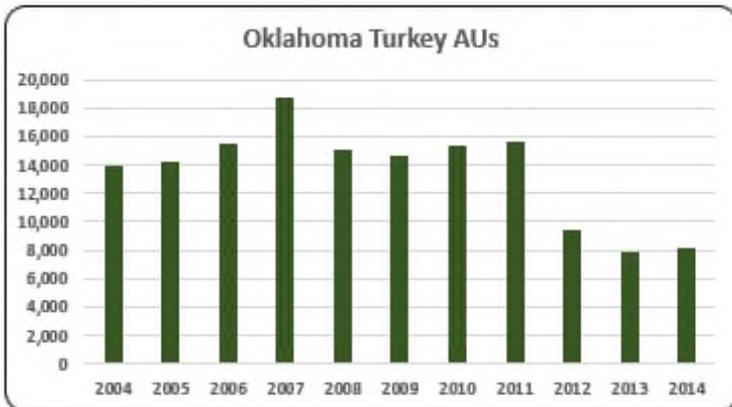
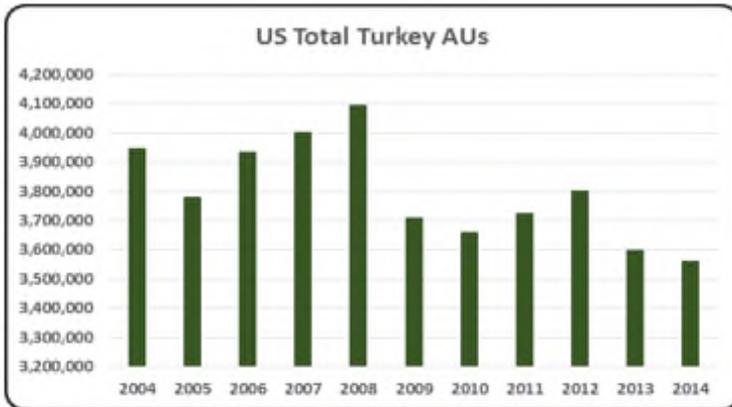
- Broiler production decreased 13.6% since the beginning of the decade. There were 617,036 broiler AUs in 2014.



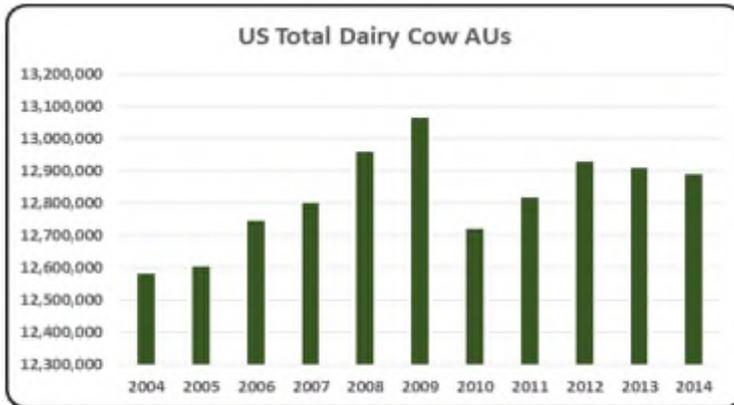
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



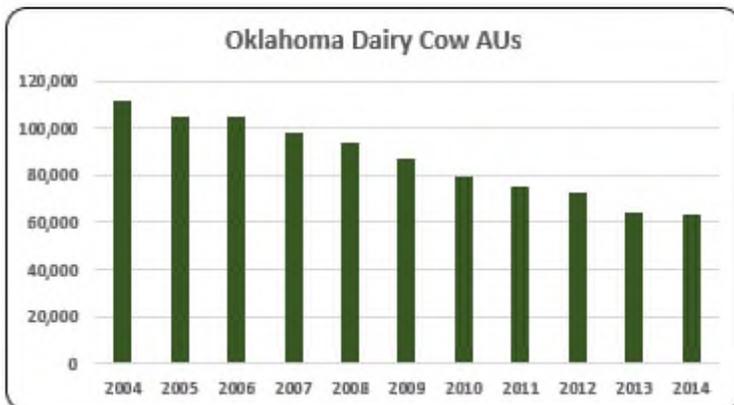
- On average, there were 13,681 layer AUs in Oklahoma from 2004 to 2014. The layer industry saw a downward trend of 19% throughout the last decade.



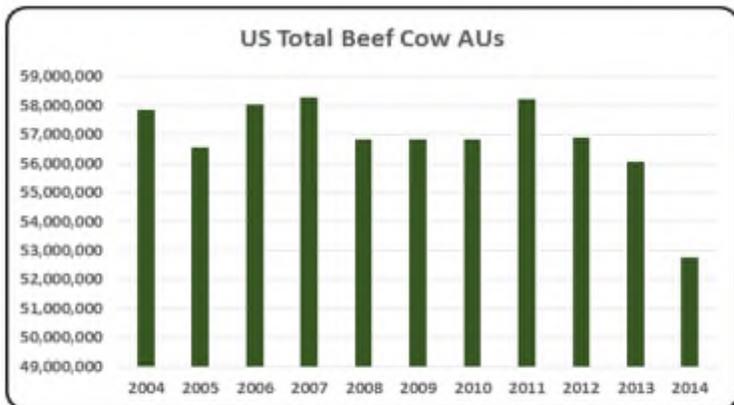
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Similar to layer production, turkey production declined (41%) during 2004 to 2014. Numbers decreased from 13,904 turkey AUs in 2004 to 8,216 turkey AUs in 2014.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Of all animal production in Oklahoma only hog production increased during the last decade. However, pork production dropped 8.4% to 1,113.8 hog AUs in 2014 from the previous year.



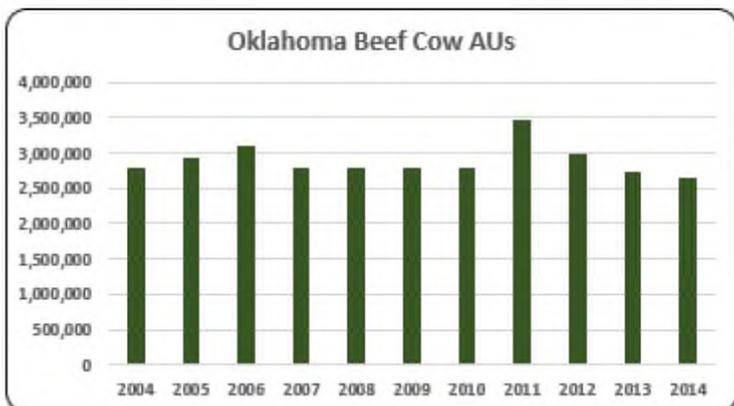
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production showed a consistent decline throughout the decade from 112,000 dairy cow AUs in 2004 to 63,000 dairy cow AUs in 2014. This was a 44% reduction in dairy cow AUs during the last decade.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- The largest animal production in Oklahoma during 2004 to 2014 was beef cow production which represents 60.18% (2,644.5 thousand beef cow AUs) of all AUs in the state.

Oklahoma Additional Information and Methodology

Animal agriculture is an important part of Oklahoma's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Oklahoma, of interest is the degree to which the industry impacts the Oklahoma economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Oklahoma animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Oklahoma's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Oklahoma which have occurred. As shown in this state report, Oklahoma has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Oklahoma. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Oklahoma Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Oklahoma's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Oklahoma, \$1.995 to \$2.873 million in total economic activity, \$0.347 to \$0.492 in household wages and 14 to 19 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.8531 | \$ 0.4806 | 18.7 |
| | Hogs, Pigs, and Other | \$ 1.9952 | \$ 0.3466 | 14.0 |
| | Poultry and Eggs | \$ 2.8729 | \$ 0.4924 | 16.4 |
| | Dairy | \$ 2.2340 | \$ 0.4023 | 16.5 |

Appendix

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 2,784,750 | 2,918,250 | 3,107,250 | 2,791,500 | 2,802,750 | 2,802,750 | 2,802,750 | 3,476,250 | 2,976,000 | 2,733,750 | 2,644,500 |
| | Hog and Pig AUs | 1,069,050 | 1,087,200 | 1,087,650 | 1,132,650 | 1,129,050 | 1,103,100 | 1,138,650 | 1,159,350 | 1,167,150 | 1,215,900 | 1,113,750 |
| | Broiler AUs | 713,762 | 736,331 | 737,612 | 714,678 | 701,175 | 664,985 | 662,132 | 645,072 | 601,458 | 619,464 | 617,036 |
| | Turkey AUs | 13,904 | 14,260 | 15,495 | 18,800 | 15,027 | 14,720 | 15,332 | 15,606 | 9,431 | 7,867 | 8,216 |
| | Egg Layer AUs | 15,229 | 16,773 | 16,185 | 14,576 | 14,160 | 12,385 | 12,303 | 12,375 | 11,979 | 12,165 | 12,359 |
| | Dairy AUs | 112,000 | 105,000 | 105,000 | 98,000 | 93,800 | 86,800 | 79,800 | 75,600 | 72,800 | 64,400 | 63,000 |
| | Total Animal Units | 4,708,695 | 4,877,813 | 5,069,192 | 4,770,204 | 4,755,962 | 4,684,739 | 4,710,966 | 5,384,252 | 4,838,818 | 4,653,546 | 4,458,861 |
| | | | | | | | | | | | | |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 1,930,138 | \$ 2,180,872 | \$ 2,105,137 | \$ 2,001,874 | \$ 1,938,825 | \$ 1,892,957 | \$ 2,155,295 | \$ 2,686,218 | \$ 2,571,177 | \$ 2,580,613 | \$ 3,295,225 |
| | Hogs and Pigs (\$1,000) | \$ 578,810 | \$ 609,305 | \$ 517,206 | \$ 549,716 | \$ 514,635 | \$ 470,649 | \$ 656,887 | \$ 902,933 | \$ 855,855 | \$ 947,769 | \$ 1,002,181 |
| | Broilers (\$1,000) | \$ 547,096 | \$ 556,290 | \$ 473,270 | \$ 540,918 | \$ 579,738 | \$ 557,723 | \$ 724,446 | \$ 729,259 | \$ 670,350 | \$ 825,702 | \$ 850,077 |
| | Turkeys (\$1,000) | \$ 12,901 | \$ 13,680 | \$ 16,168 | \$ 21,681 | \$ 20,296 | \$ 13,612 | \$ 18,236 | \$ 20,453 | \$ 13,677 | \$ 9,007 | \$ 15,081 |
| | Eggs (\$1,000) | \$ 67,102 | \$ 59,862 | \$ 59,646 | \$ 71,107 | \$ 80,888 | \$ 70,175 | \$ 84,499 | \$ 88,168 | \$ 91,776 | \$ 97,227 | \$ 102,226 |
| | Milk (\$1,000) | \$ 221,025 | \$ 201,468 | \$ 179,672 | \$ 239,096 | \$ 214,322 | \$ 146,292 | \$ 172,620 | \$ 203,060 | \$ 172,659 | \$ 167,485 | \$ 180,523 |
| | Other | \$ 5,666 | \$ 5,800 | \$ 4,930 | \$ 4,641 | \$ 4,486 | \$ 4,186 | \$ 5,091 | \$ 4,201 | \$ 4,008 | \$ 3,815 | \$ 3,622 |
| | Sheep and Lambs (\$1,000) | \$ 3,521 | \$ 3,842 | \$ 3,159 | \$ 3,056 | \$ 3,088 | \$ 2,975 | \$ 4,067 | \$ 3,363 | \$ 3,357 | \$ 3,351 | \$ 3,345 |
| | Aquaculture (\$1,000) | \$ 2,145 | \$ 1,958 | \$ 1,771 | \$ 1,585 | \$ 1,398 | \$ 1,211 | \$ 1,024 | \$ 838 | \$ 651 | \$ 464 | \$ 277 |
| | Total (\$1,000) | \$ 3,362,738 | \$ 3,627,277 | \$ 3,356,029 | \$ 3,429,033 | \$ 3,353,190 | \$ 3,155,594 | \$ 3,817,074 | \$ 4,634,291 | \$ 4,379,502 | \$ 4,631,618 | \$ 5,448,935 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 48,670 | 49,043 | 45,871 | 40,939 | |
| | Cattle feedlots (112112) | 1,158 | 1,799 | 956 | 372 | |
| | Dairy cattle and milk production (11212) | 838 | 1,037 | 721 | 309 | |
| | Hog and pig farming (1122) | 1,000 | 940 | 986 | 623 | |
| | Poultry and egg production (1123) | 1,164 | 1,504 | 2,358 | 1,472 | |
| | Sheep and goat farming (1124) | 633 | 1,426 | 2,446 | 2,269 | |
| | Animal aquaculture and other animal production (1125,1129) | 3,555 | 7,792 | 8,513 | 8,660 | |
| Value of Sales (\$1,000) | Cattle and Calves | 2,325,567 | 2,448,916 | 3,062,020 | 3,402,919 | |
| | Hogs and Pigs | 343,147 | 462,849 | 555,521 | 656,407 | |
| | Poultry and Eggs | 447,185 | 508,373 | 748,776 | 961,302 | |
| | Milk and Other Dairy Products | 150,138 | 163,006 | 191,775 | 164,341 | |
| | Aquaculture | 3,639 | 3,467 | 3,253 | 1,271 | |
| | Other (calculated) | 32,372 | 50,715 | 57,091 | 25,609 | |
| | Total | 3,302,048 | 3,637,326 | 4,618,436 | 5,211,849 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 26,102 | 27,203 | 24,499 | 24,658 | |
| | | \$1,000 | 1,100,066 | 1,244,354 | 1,463,556 | 1,696,662 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 16,355 | 15,462 | 15,940 | |
| | | \$1,000 | <i>n/a</i> | 80,813 | 187,690 | 173,024 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 14,409 | 12,523 | 12,687 | |
| | | \$1,000 | <i>n/a</i> | 1,163,542 | 1,275,865 | 1,523,638 |
| Feed purchased | (Farms) | 53,275 | 64,090 | 57,396 | 61,650 | |
| | \$1,000 | 900,546 | 917,560 | 1,307,568 | 2,017,049 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 9,401,606 | \$ 1,583,685 | 61,524 | \$ 405,107 |
| | Hogs, Pigs, and Other | \$ 2,006,779 | \$ 348,611 | 14,117 | \$ 89,175 |
| | Poultry and Eggs | \$ 2,779,197 | \$ 476,340 | 15,901 | \$ 121,848 |
| | Dairy | \$ 403,288 | \$ 72,624 | 2,986 | \$ 18,577 |
| | Total | \$ 14,590,870 | \$ 2,481,261 | 94,529 | \$ 634,706 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 2,500,198 | \$ 421,154 | 16,361 | \$ 107,731 |
| | Hogs, Pigs, and Other | \$ 545,324 | \$ 94,732 | 3,836 | \$ 24,232 |
| | Poultry and Eggs | \$ 521,379 | \$ 89,362 | 2,983 | \$ 22,859 |
| | Dairy | \$ (215,521) | \$ (38,811) | (1,596) | \$ (9,928) |
| | Total | \$ 3,351,381 | \$ 566,437 | 21,585 | \$ 144,895 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.8531 | \$ 0.4806 | 18.7 | |
| | Hogs, Pigs, and Other | \$ 1.9952 | \$ 0.3466 | 14.0 | |
| | Poultry and Eggs | \$ 2.8729 | \$ 0.4924 | 16.4 | |
| | Dairy | \$ 2.2340 | \$ 0.4023 | 16.5 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 5.3% |
| | Total | | | | 25.6% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: OREGON

Oregon Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Oregon's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Oregon. The success of Oregon animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Oregon during 2014 animal agriculture contributed:

- \$4.4 billion in economic output
- 31,382 jobs
- \$768.7 million in earnings
- \$225.5 million in income taxes paid at local, state, and federal levels
- \$112.8 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Oregon increased economic output by over \$1.1 billion, boosted household earnings by \$198.0 million, contributed 8,344 additional jobs and paid \$58.1 million in additional tax revenues.

Oregon's animal agriculture consumed about 57.4 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (15.9 thousand tons)
- Turkeys (14.5 thousand tons)
- Egg-Laying Hens (14.0 thousand tons)

This report examines animal agriculture in Oregon over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Oregon, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Oregon and beyond.

Oregon Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Oregon's economy. In 2014, Oregon's animal agriculture contributed the following to the economy:

- About \$4.4 billion in economic output
- \$768.7 million in household earnings
- 31,382 jobs
- \$225.5 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Oregon's animal agriculture has:

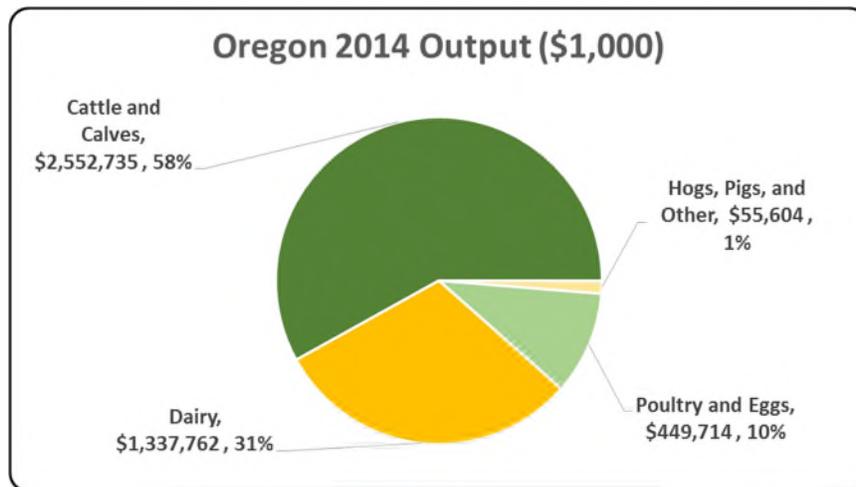
- Increased economic output by \$1.1 billion
- Boosted household earnings by \$198.0 million
- Added 8,344 jobs
- Paid an additional \$58.1 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 4,395,816 | \$ 1,130,772 | 34.63% |
| Earnings (\$1,000) | \$ 768,741 | \$ 197,955 | 34.68% |
| Employment (Jobs) | 31,382 | 8,344 | 36.22% |
| Income Taxes Paid (\$1,000) | \$ 225,472 | \$ 58,060 | 34.68% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 112,834 | | |

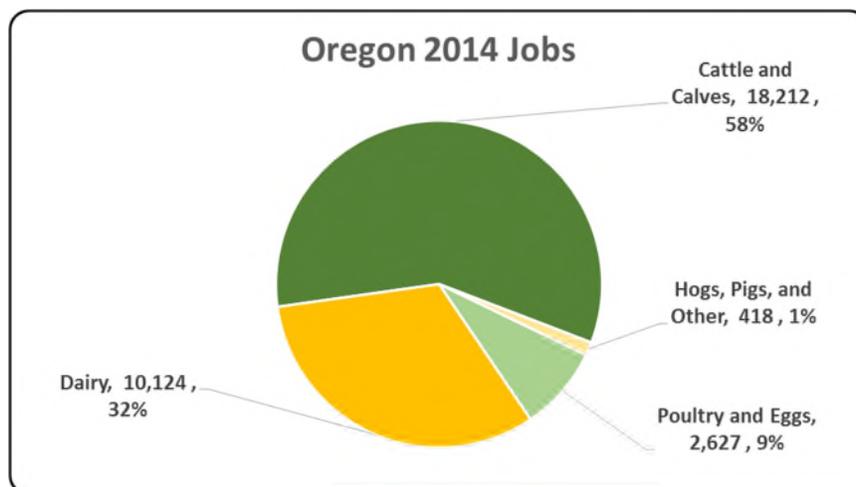
Oregon Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Oregon economy. Animal agriculture’s impact on Oregon total economic output is about \$4.4 billion.



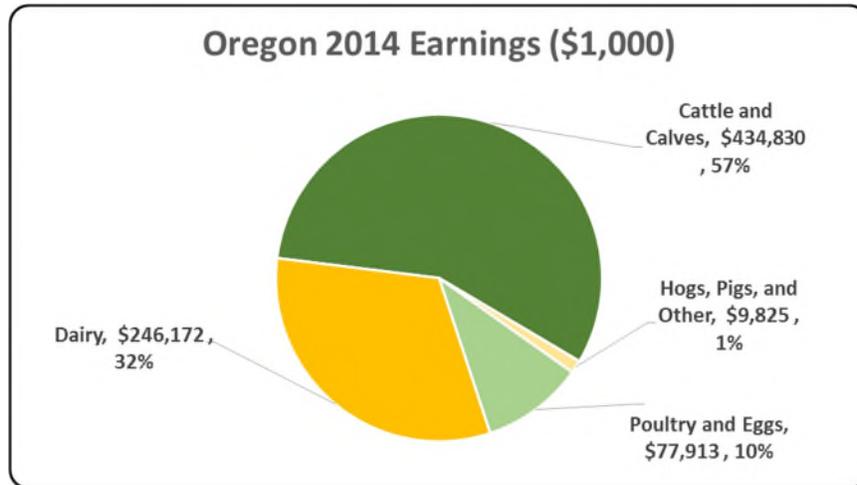
Oregon Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Oregon in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Oregon total jobs, contributing 31,382 jobs within and outside of animal agriculture.



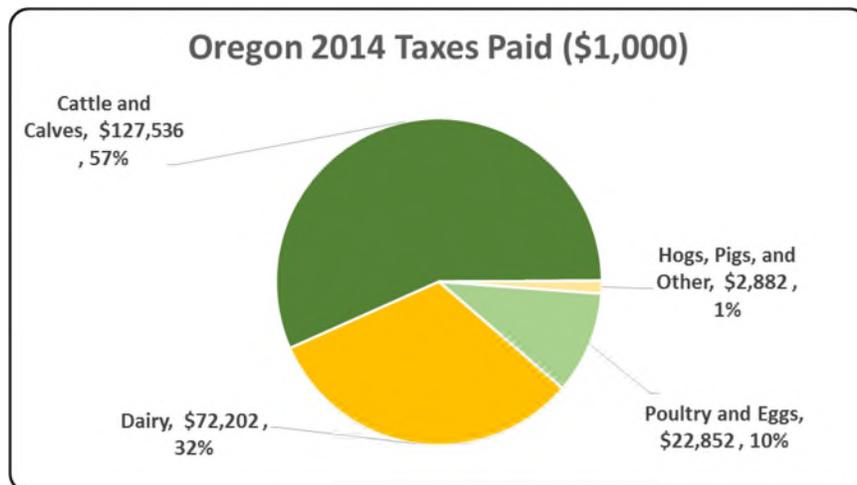
Oregon Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Oregon economy in terms of earnings. Oregon’s animal agriculture contributed about \$768.7 million to household earnings in 2014.



Oregon Taxes Paid by Animal Agriculture

Oregon’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$225.5 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$112.8 million in property taxes paid by all of Oregon agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



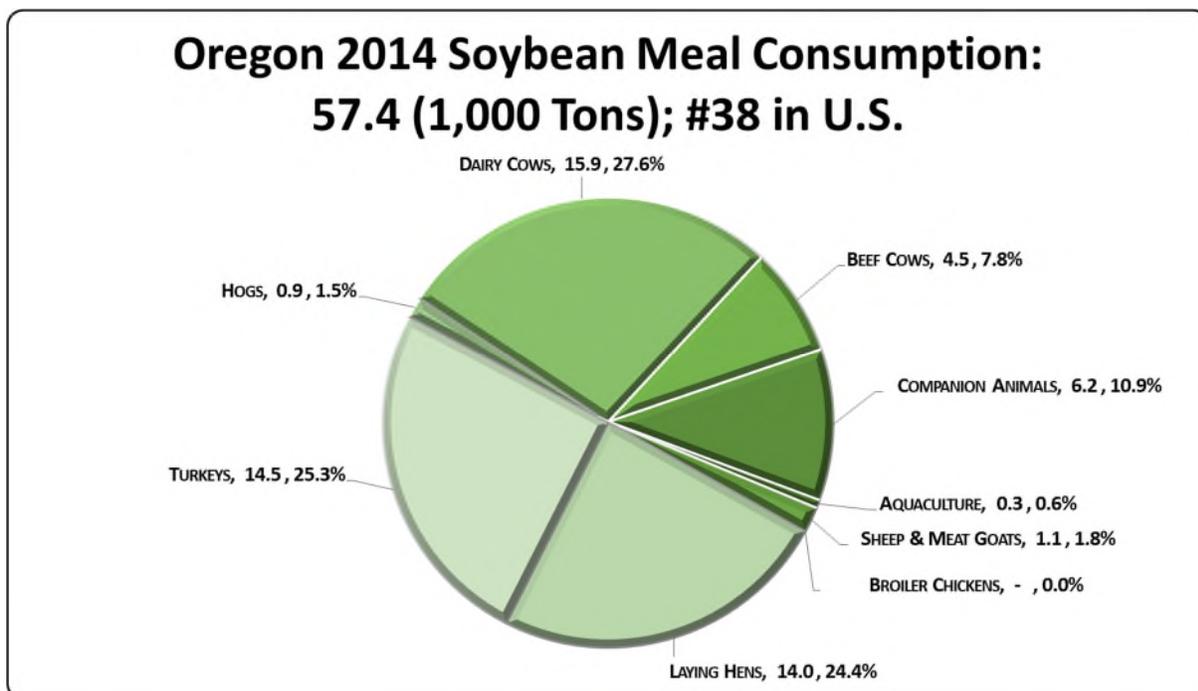
Oregon Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Oregon's animal agriculture consumed almost 57.4 thousand tons of soybean meal in 2014, placing the state as #38 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (15.9 thousand tons)
- Turkeys (14.5 thousand tons)
- Egg-Laying Hens (14.0 thousand tons)

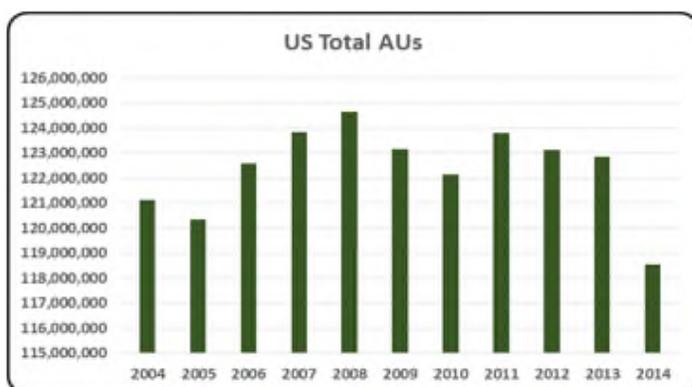


Oregon Animal Unit (AU) Trends

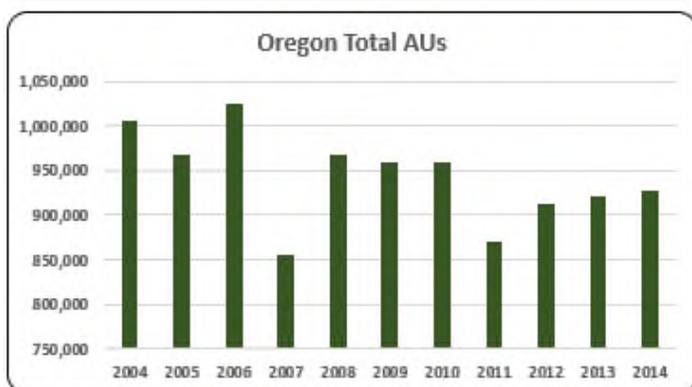
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Oregon. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Oregon and to give perspective on Oregon's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

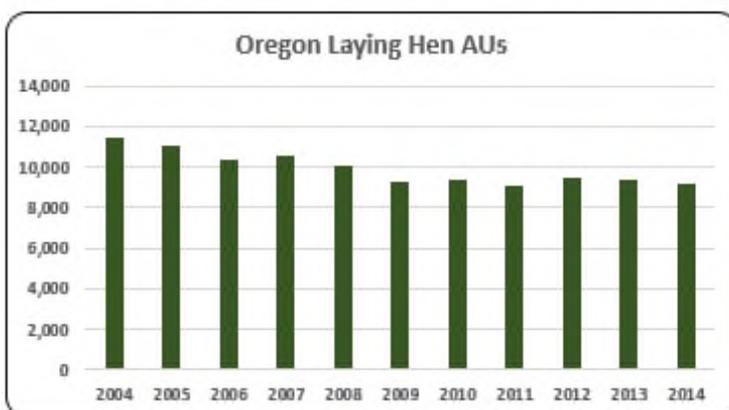
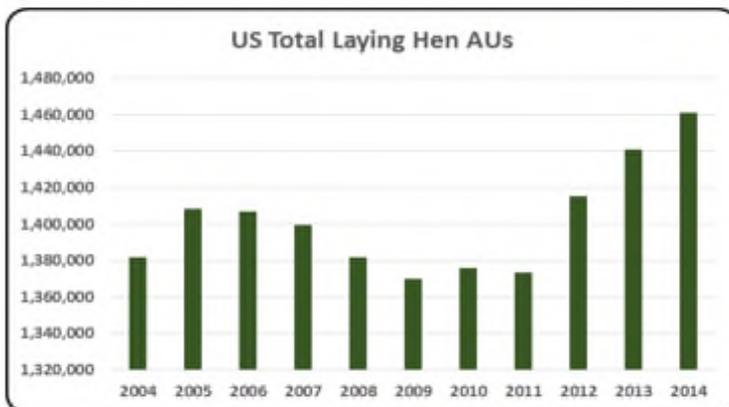
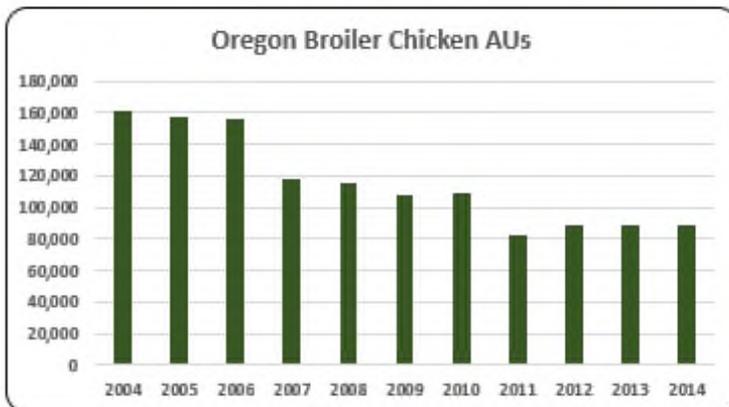
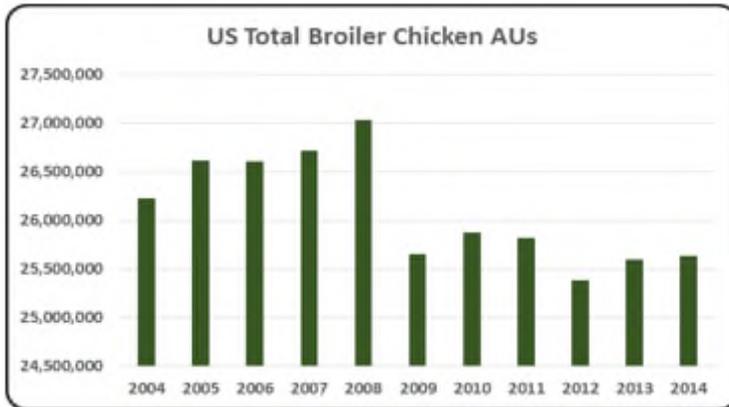
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Oregon, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (629.9 thousand AUs), Dairy Cows (173.6 thousand AUs), and Broilers (88.0 thousand AUs). Total animal units in Oregon during 2014 were 927.7 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- Animal production in Oregon fluctuated during last decade from record high in 2006 (1,025.6 thousand AUs) to record low (855,798) the following year. Overall animal production declined 7.7% during 2004-2014.

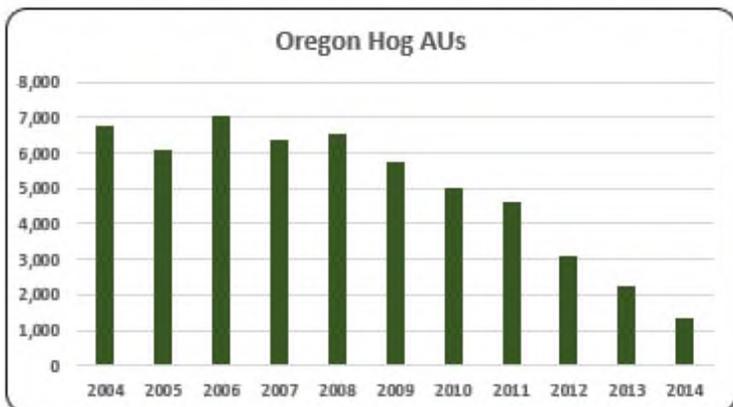
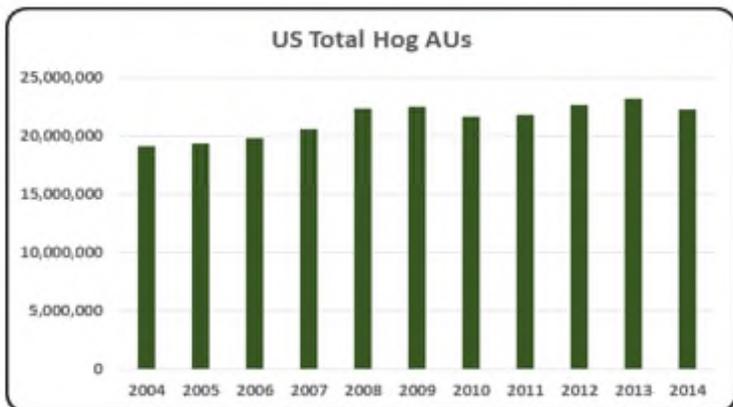
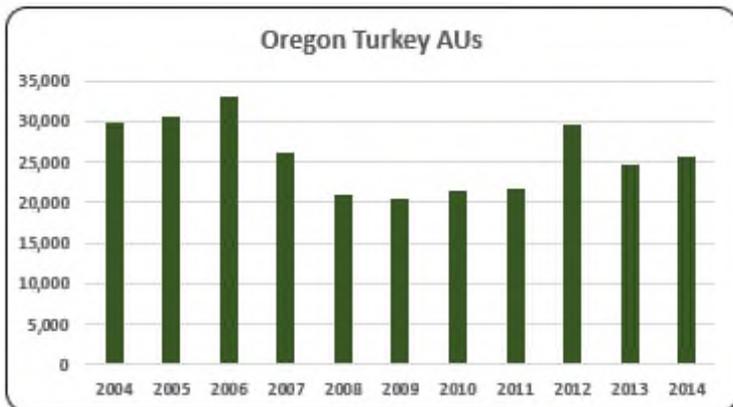
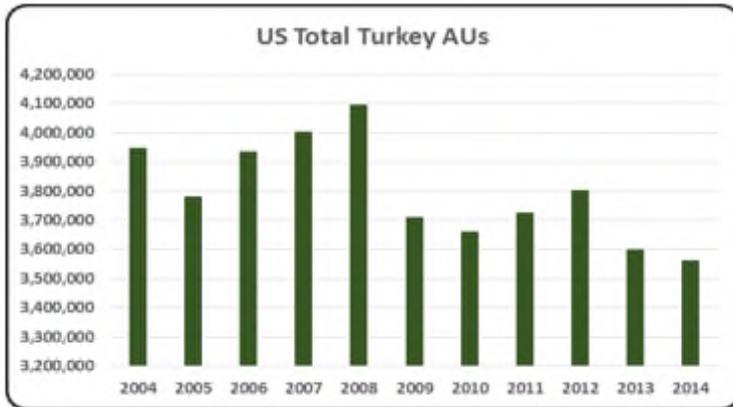


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

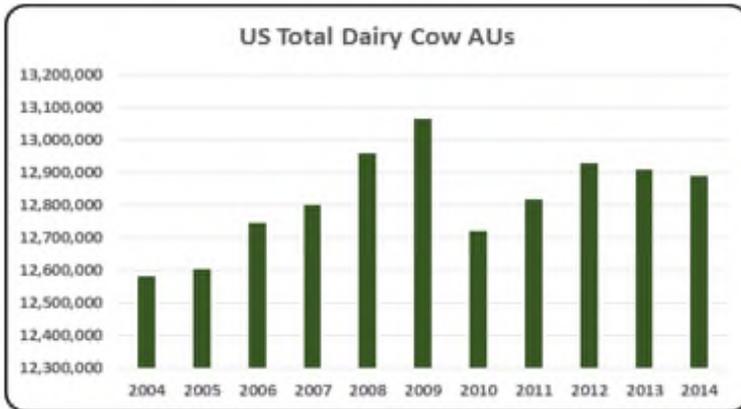
- Broiler production represented 9.5% (88,028 broiler AUs) of all animal production in 2014. There was a decrease of 45.3% in broiler AUs during the last decade.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

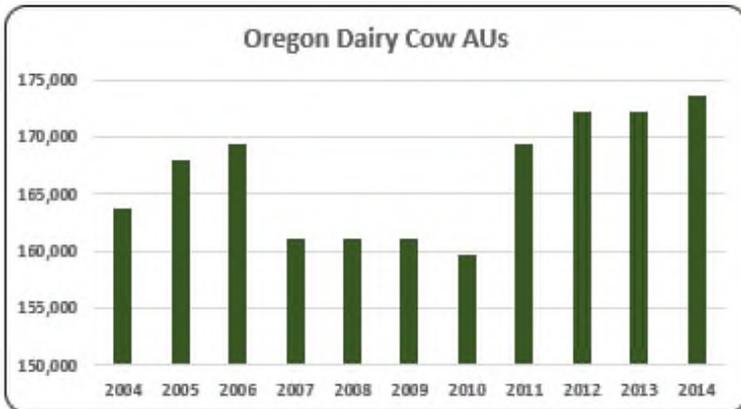
- There were 9,127 layer AUs in Oregon in 2014. Only 1% of total AUs came from layer production in 2014. Layer production fell 20% from 2004 to 2014.



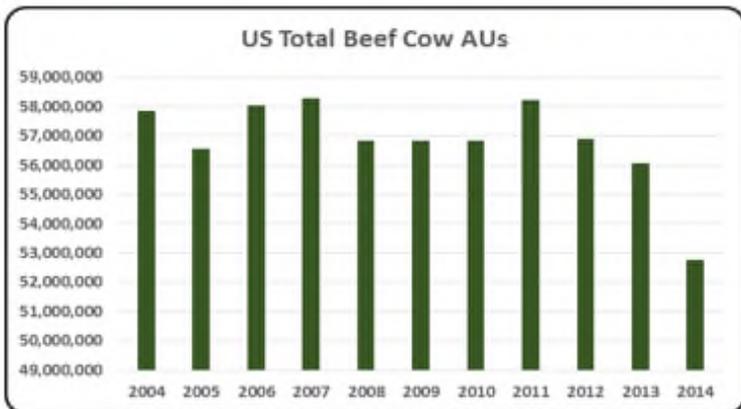
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production also declined 14% throughout the decade. There were 25,798 turkey AUs on average from 2004 to 2014.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- The animal production that deteriorated the most in Oregon during last decade was hog production, with an 80% decline. The total number of hog AUs in 2014 was 1,365.



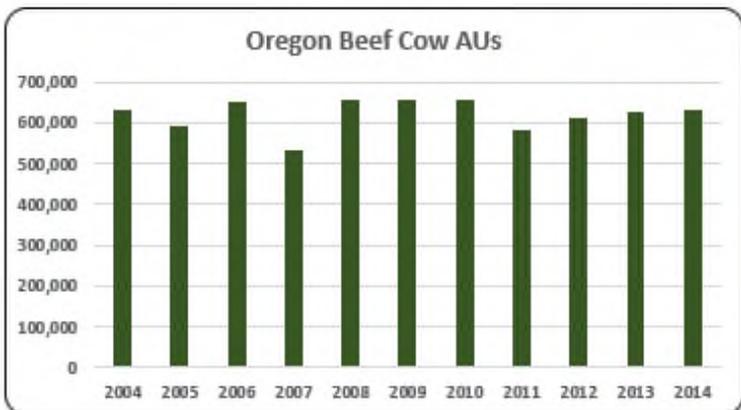
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Numbers increased from 163,800 dairy cow AUs in 2004 to 173,600 dairy cow AUs in 2014. The largest increase in dairy cow production occurred from 2011 to 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production was the most important animal production in the state of Oregon from 2004 to 2014. Beef cow production underwent a slight (0.5%) reduction through the decade. The average number of beef cow AUs during the decade was 620,005.

Oregon Additional Information and Methodology

Animal agriculture is an important part of Oregon's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Oregon, of interest is the degree to which the industry impacts the Oregon economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Oregon animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Oregon's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Oregon which have occurred. As shown in this state report, Oregon has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Oregon. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Oregon Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Oregon’s economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of “per million dollars” of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Oregon, \$1.772 to \$2.769 million in total economic activity, \$0.313 to \$0.472 in household wages and 12 to 20 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|----------------------------|------------------------------|-------------------|----------------------|--------------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.7686 | \$ 0.4716 | 19.8 |
| | Hogs, Pigs, and Other | \$ 1.7720 | \$ 0.3131 | 13.3 |
| | Poultry and Eggs | \$ 1.9896 | \$ 0.3447 | 11.6 |
| | Dairy | \$ 2.0373 | \$ 0.3749 | 15.4 |

Appendix

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------------------------|-----------------------------|---------------------|---------------------|---------------------|---------------------|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------|
| Animal Units (AUs) | Beef Cattle AUs | 632,700 | 593,850 | 649,050 | 534,150 | 654,300 | 654,300 | 654,300 | 583,350 | 609,900 | 624,300 | 629,850 |
| | Hog and Pig AUs | 6,750 | 6,090 | 7,050 | 6,375 | 6,525 | 5,775 | 5,025 | 4,605 | 3,075 | 2,220 | 1,365 |
| | Broiler AUs | 161,051 | 157,661 | 156,597 | 117,601 | 115,767 | 107,637 | 109,084 | 82,196 | 88,841 | 88,531 | 88,028 |
| | Turkey AUs | 29,743 | 30,504 | 33,145 | 26,163 | 20,913 | 20,485 | 21,337 | 21,718 | 29,484 | 24,595 | 25,687 |
| | Egg Layer AUs | 11,444 | 11,084 | 10,332 | 10,508 | 10,052 | 9,264 | 9,400 | 9,028 | 9,499 | 9,339 | 9,127 |
| | Dairy AUs | 163,800 | 168,000 | 169,400 | 161,000 | 161,000 | 161,000 | 159,600 | 169,400 | 172,200 | 172,200 | 173,600 |
| | Total Animal Units | 1,005,488 | 967,189 | 1,025,574 | 855,798 | 968,557 | 958,460 | 958,747 | 870,297 | 912,999 | 921,185 | 927,657 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 503,469 | \$ 524,765 | \$ 475,852 | \$ 458,389 | \$ 432,677 | \$ 427,549 | \$ 490,900 | \$ 634,386 | \$ 675,073 | \$ 712,765 | \$ 922,031 |
| | Hogs and Pigs (\$1,000) | \$ 5,614 | \$ 5,013 | \$ 5,300 | \$ 5,154 | \$ 5,809 | \$ 4,239 | \$ 4,968 | \$ 5,169 | \$ 3,322 | \$ 2,122 | \$ 2,017 |
| | Broilers (\$1,000) | \$ 135,458 | \$ 128,312 | \$ 99,157 | \$ 88,470 | \$ 91,050 | \$ 78,868 | \$ 83,012 | \$ 73,138 | \$ 88,501 | \$ 107,816 | \$ 113,103 |
| | Turkeys (\$1,000) | \$ 27,597 | \$ 29,263 | \$ 34,585 | \$ 30,173 | \$ 28,246 | \$ 18,943 | \$ 25,378 | \$ 28,463 | \$ 42,762 | \$ 28,160 | \$ 47,149 |
| | Eggs (\$1,000) | \$ 48,693 | \$ 30,626 | \$ 34,444 | \$ 47,379 | \$ 64,775 | \$ 47,765 | \$ 51,756 | \$ 52,462 | \$ 54,128 | \$ 56,228 | \$ 65,781 |
| | Milk (\$1,000) | \$ 363,200 | \$ 358,588 | \$ 329,574 | \$ 408,639 | \$ 412,482 | \$ 307,976 | \$ 415,027 | \$ 530,506 | \$ 497,574 | \$ 532,968 | \$ 656,635 |
| | Other | \$ 22,687 | \$ 25,553 | \$ 21,965 | \$ 23,103 | \$ 23,715 | \$ 25,095 | \$ 28,971 | \$ 27,253 | \$ 27,956 | \$ 28,659 | \$ 29,362 |
| | Sheep and Lambs (\$1,000) | \$ 10,165 | \$ 13,075 | \$ 9,531 | \$ 10,713 | \$ 11,369 | \$ 12,792 | \$ 16,712 | \$ 15,039 | \$ 15,785 | \$ 16,532 | \$ 17,279 |
| | Aquaculture (\$1,000) | \$ 12,522 | \$ 12,478 | \$ 12,434 | \$ 12,390 | \$ 12,346 | \$ 12,303 | \$ 12,259 | \$ 12,215 | \$ 12,171 | \$ 12,127 | \$ 12,083 |
| Total (\$1,000) | \$ 1,106,717 | \$ 1,102,119 | \$ 1,000,877 | \$ 1,061,307 | \$ 1,058,754 | \$ 910,435 | \$ 1,100,012 | \$ 1,351,378 | \$ 1,389,316 | \$ 1,468,718 | \$ 1,836,078 | |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 12,037 | 11,231 | 12,071 | 11,420 | |
| | Cattle feedlots (112112) | 1,111 | 1,593 | 778 | 140 | |
| | Dairy cattle and milk production (11212) | 469 | 521 | 432 | 344 | |
| | Hog and pig farming (1122) | 415 | 534 | 425 | 447 | |
| | Poultry and egg production (1123) | 304 | 622 | 891 | 965 | |
| | Sheep and goat farming (1124) | 1,488 | 1,816 | 2,103 | 1,871 | |
| | Animal aquaculture and other animal production (1125,1129) | 3,358 | 6,781 | 5,403 | 3,892 | |
| Value of Sales (\$1,000) | Cattle and Calves | 474,804 | 543,231 | 800,336 | 894,485 | |
| | Hogs and Pigs | 6,161 | 3,540 | 5,662 | 3,195 | |
| | Poultry and Eggs | 99,551 | 86,506 | 119,812 | 127,481 | |
| | Milk and Other Dairy Products | 207,240 | 293,927 | 401,786 | 519,790 | |
| | Aquaculture | - | 17,054 | 16,270 | 22,490 | |
| | Other (calculated) | 68,599 | 56,328 | 66,189 | 55,405 | |
| | Total | 856,355 | 1,000,586 | 1,410,055 | 1,622,846 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 9,806 | 11,223 | 9,557 | 10,191 | |
| | | \$1,000 | 144,065 | 201,604 | 281,444 | 293,739 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 5,484 | 4,840 | 4,937 | |
| | | \$1,000 | <i>n/a</i> | 22,334 | 33,064 | 42,659 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 7,244 | 6,048 | 6,774 | |
| | | \$1,000 | <i>n/a</i> | 179,270 | 248,380 | 251,080 |
| | Feed purchased | (Farms) 18,390 | 24,322 | 21,691 | 21,341 | |
| | | \$1,000 | 229,748 | 259,418 | 454,733 | 628,524 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 2,552,735 | \$ 434,830 | 18,212 | \$ 127,536 |
| | Hogs, Pigs, and Other | \$ 55,604 | \$ 9,825 | 418 | \$ 2,882 |
| | Poultry and Eggs | \$ 449,714 | \$ 77,913 | 2,627 | \$ 22,852 |
| | Dairy | \$ 1,337,762 | \$ 246,172 | 10,124 | \$ 72,202 |
| | Total | \$ 4,395,816 | \$ 768,741 | 31,382 | \$ 225,472 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 805,846 | \$ 137,267 | 5,749 | \$ 40,260 |
| | Hogs, Pigs, and Other | \$ (7,244) | \$ (1,280) | (54) | \$ (375) |
| | Poultry and Eggs | \$ (78,264) | \$ (13,559) | (457) | \$ (3,977) |
| | Dairy | \$ 410,435 | \$ 75,527 | 3,106 | \$ 22,152 |
| | Total | \$ 1,130,772 | \$ 197,955 | 8,344 | \$ 58,060 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.7686 | \$ 0.4716 | 19.8 | |
| | Hogs, Pigs, and Other | \$ 1.7720 | \$ 0.3131 | 13.3 | |
| | Poultry and Eggs | \$ 1.9896 | \$ 0.3447 | 11.6 | |
| | Dairy | \$ 2.0373 | \$ 0.3749 | 15.4 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 9.0% |
| | Total | | | | 29.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: PENNSYLVANIA

Pennsylvania Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Pennsylvania's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Pennsylvania. The success of Pennsylvania animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Pennsylvania during 2014 animal agriculture contributed:

- \$11.2 billion in economic output
- 75,408 jobs
- \$2.0 billion in earnings
- \$474.9 million in income taxes paid at local, state, and federal levels
- \$229.9 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Pennsylvania increased economic output by over \$2.8 billion, boosted household earnings by \$508.7 million, contributed 18,385 additional jobs and paid \$119.0 million in additional tax revenues.

Pennsylvania's animal agriculture consumed about 742.5 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (209.5 thousand tons)
- Dairy Cows (169.0 thousand tons)
- Egg-Laying Hens (153.8 thousand tons)

This report examines animal agriculture in Pennsylvania over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Pennsylvania, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Pennsylvania and beyond.

Pennsylvania Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Pennsylvania's economy. In 2014, Pennsylvania's animal agriculture contributed the following to the economy:

- About \$11.2 billion in economic output
- \$2.0 billion in household earnings
- 75,408 jobs
- \$474.9 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Pennsylvania's animal agriculture has:

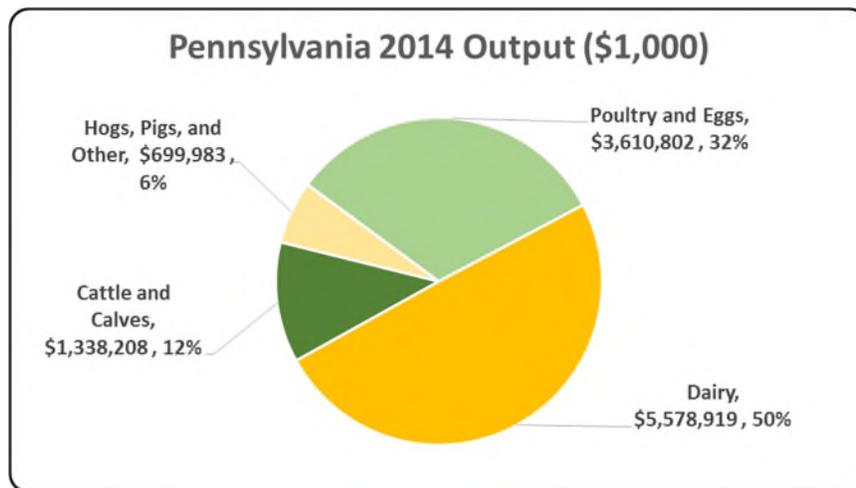
- Increased economic output by \$2.8 billion
- Boosted household earnings by \$508.7 million
- Added 18,385 jobs
- Paid an additional \$119.0 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 11,227,912 | \$ 2,828,344 | 33.67% |
| Earnings (\$1,000) | \$ 2,029,274 | \$ 508,668 | 33.45% |
| Employment (Jobs) | 75,408 | 18,385 | 32.24% |
| Income Taxes Paid (\$1,000) | \$ 474,850 | \$ 119,028 | 33.45% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 229,885 | | |

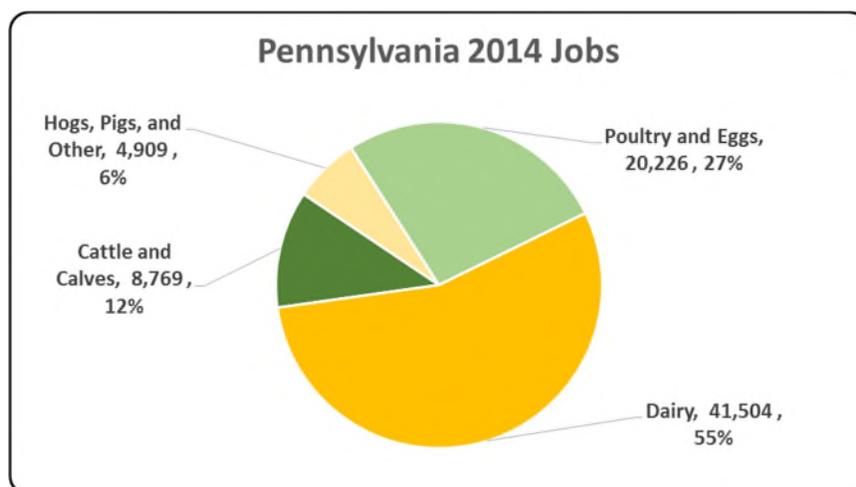
Pennsylvania Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Pennsylvania economy. Animal agriculture’s impact on Pennsylvania total economic output is about \$11.2 billion.



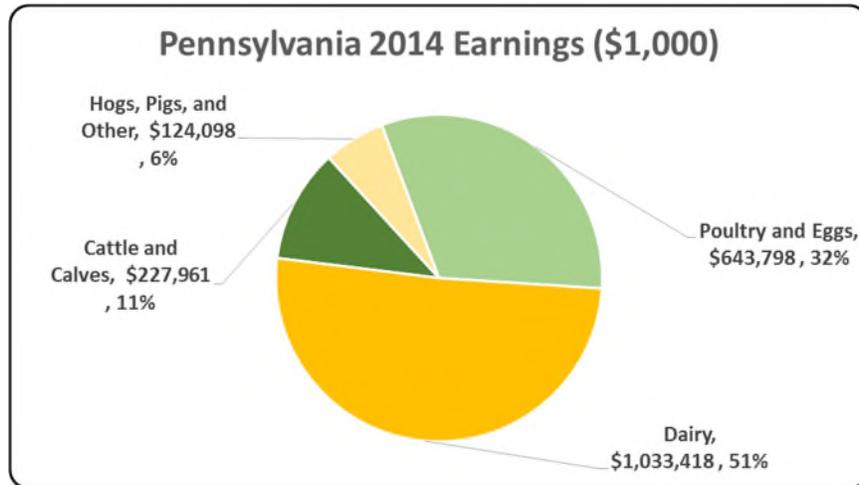
Pennsylvania Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Pennsylvania in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Pennsylvania total jobs, contributing 75,408 jobs within and outside of animal agriculture.



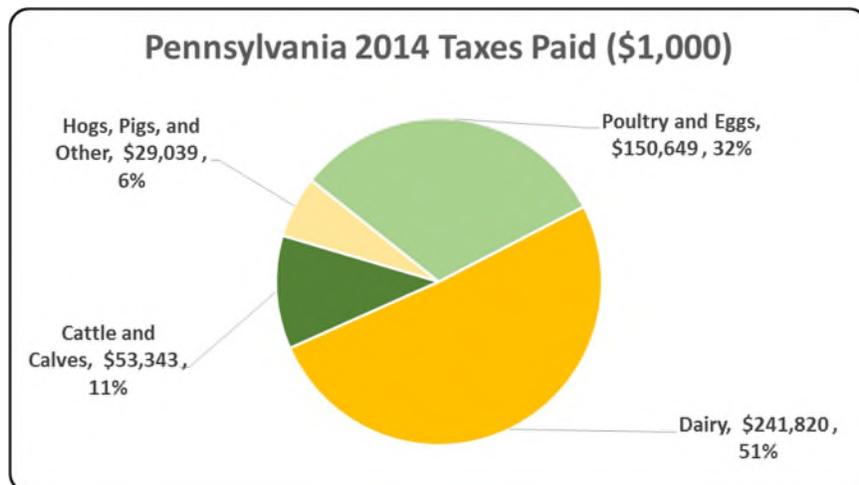
Pennsylvania Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Pennsylvania economy in terms of earnings. Pennsylvania’s animal agriculture contributed about \$2.0 billion to household earnings in 2014.



Pennsylvania Taxes Paid by Animal Agriculture

Pennsylvania’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$474.9 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$229.9 million in property taxes paid by all of Pennsylvania agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



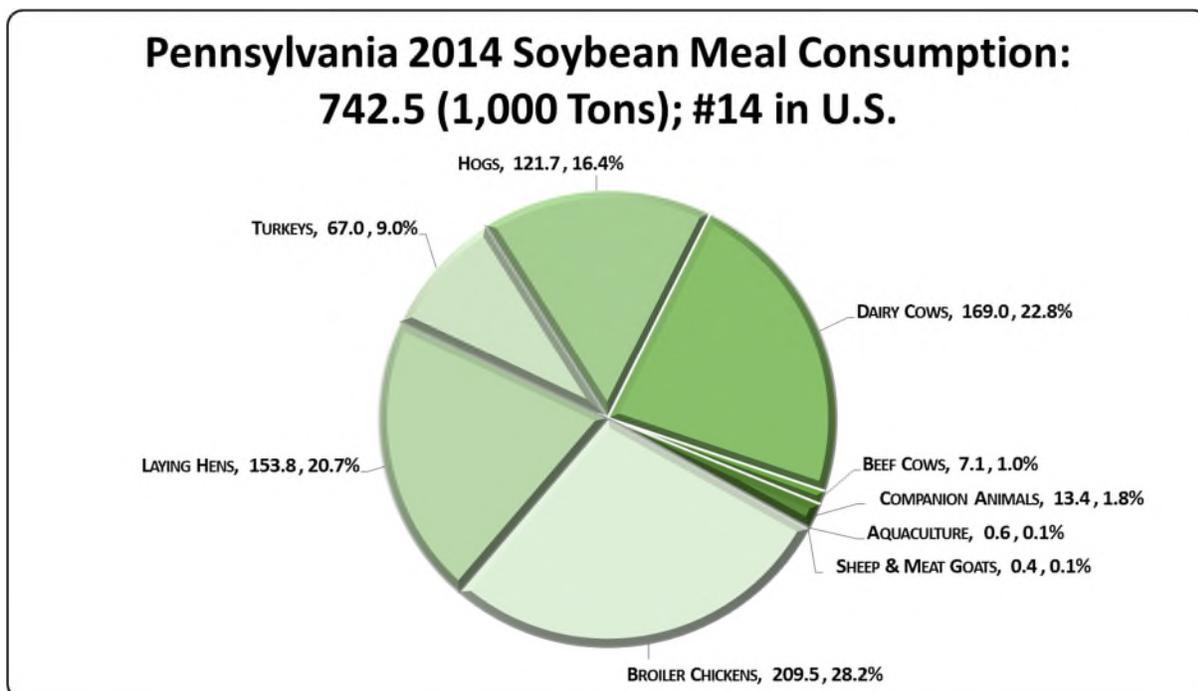
Pennsylvania Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Pennsylvania's animal agriculture consumed almost 742.5 thousand tons of soybean meal in 2014, placing the state as #14 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (209.5 thousand tons)
- Dairy Cows (169.0 thousand tons)
- Egg-Laying Hens (153.8 thousand tons)

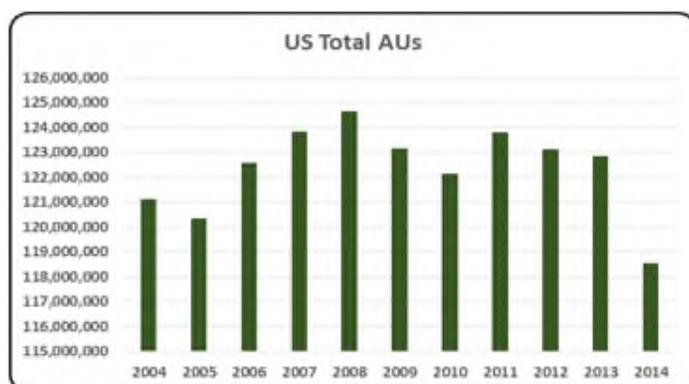


Pennsylvania Animal Unit (AU) Trends

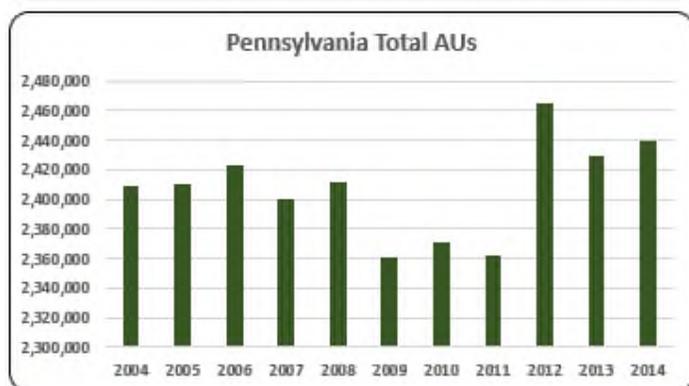
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Pennsylvania. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Pennsylvania and to give perspective on Pennsylvania's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

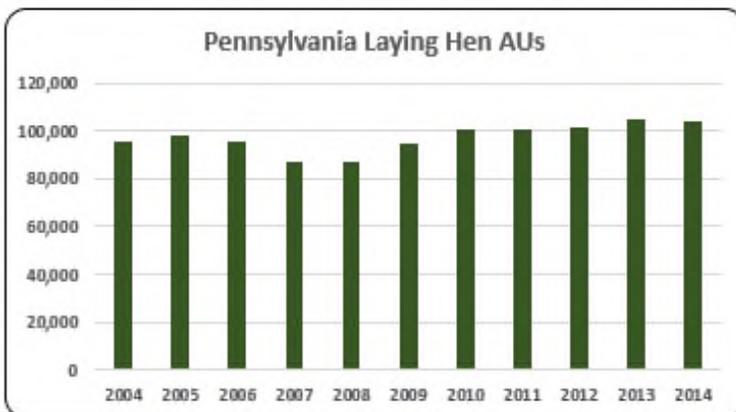
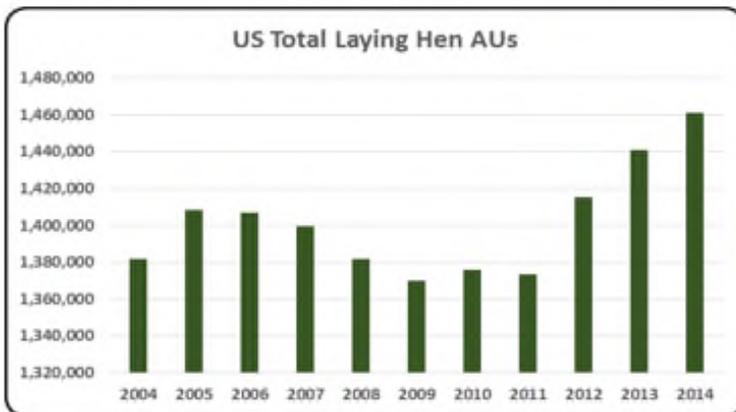
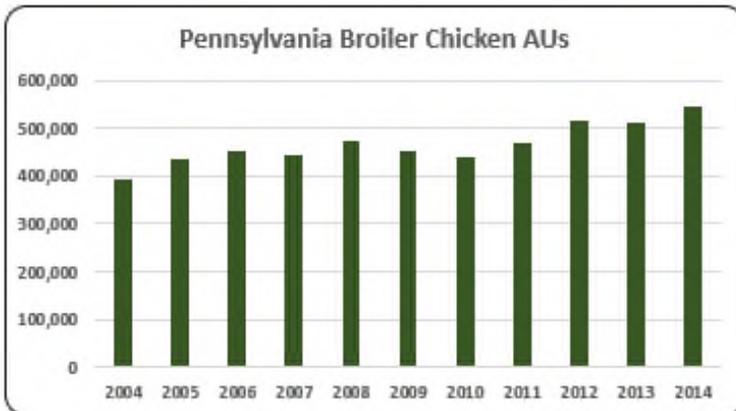
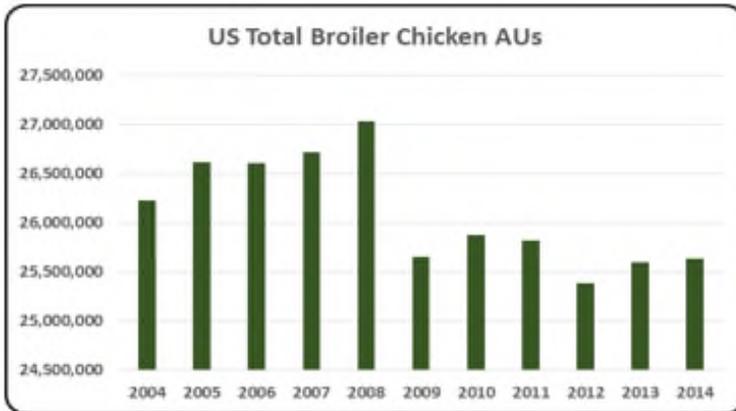
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Pennsylvania, the largest three segments of animal agriculture in terms of AUs during 2014 were: Dairy Cows (742.0 thousand AUs), Beef Cows (630.5 thousand AUs), and Broilers (544.9 thousand AUs). Total animal units in Pennsylvania during 2014 were 2,438.9 thousand AUs.



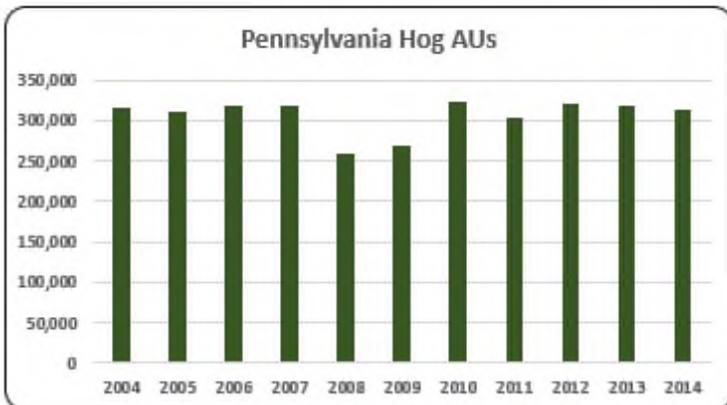
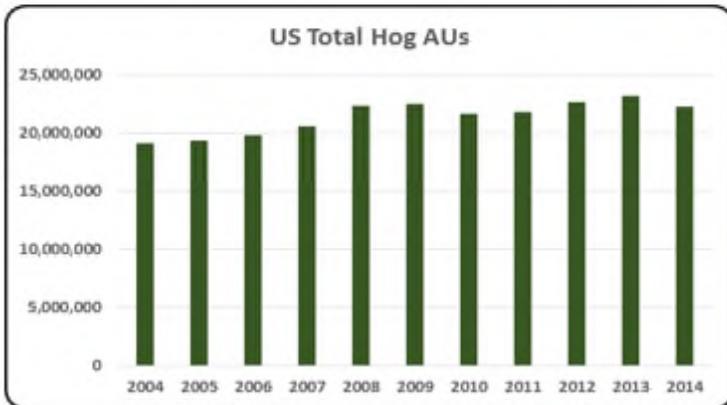
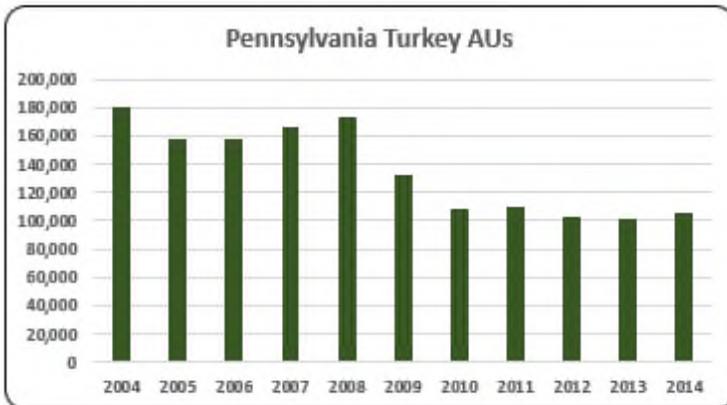
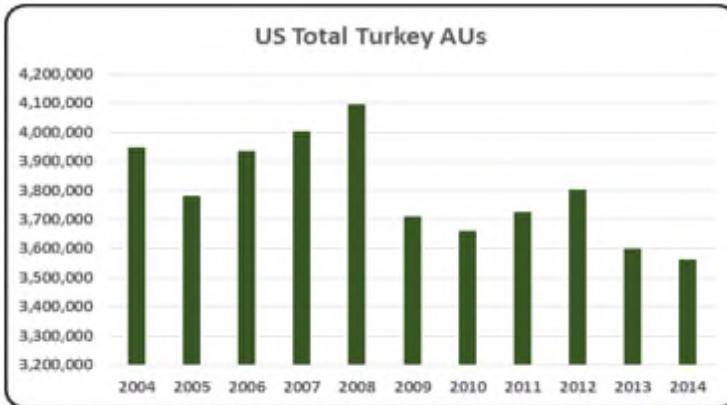
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



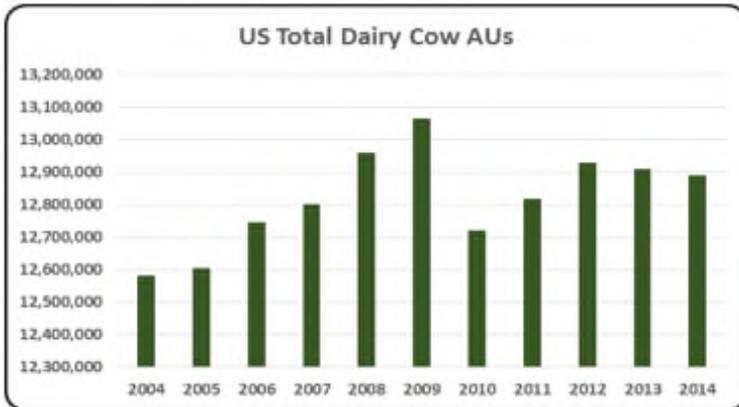
- There were 2,438.9 thousand AUs in Pennsylvania in 2014 representing 2.06% of all AUs in the U.S. 2014 was an above average year in the state with 2,464.6 thousand AUs. Overall Pennsylvania's animal production increased 1.3% during the last decade.



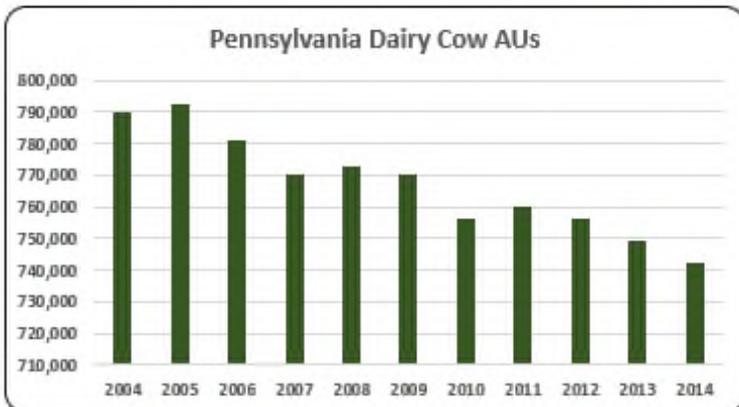
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- On average, there were 466,490 broiler AUs during the last decade. Broiler production showed a 39.4% expansion from 2004 to 2014.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- In general, layer production showed an upward trend, increasing 9% throughout the decade. There were 104,061 layer AUs in 2014. Pennsylvania accounted for seven percent of all layer production in the U.S. in 2014.



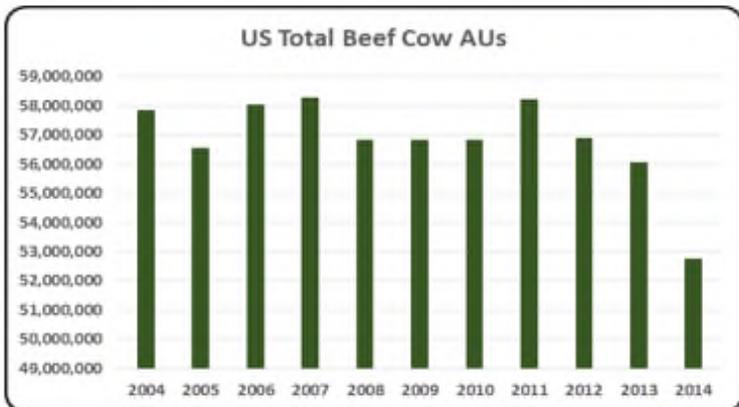
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production declined 42% percent, with the largest drop in production starting in 2009. From 2009 to 2014, on average, there were 109,714 turkey AUs.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- There were 312,450 hog AUs in 2014. Hog production decreased 1% from 2004 to 2014, but contributed 12.81% to the total Pennsylvania AU numbers in 2014.



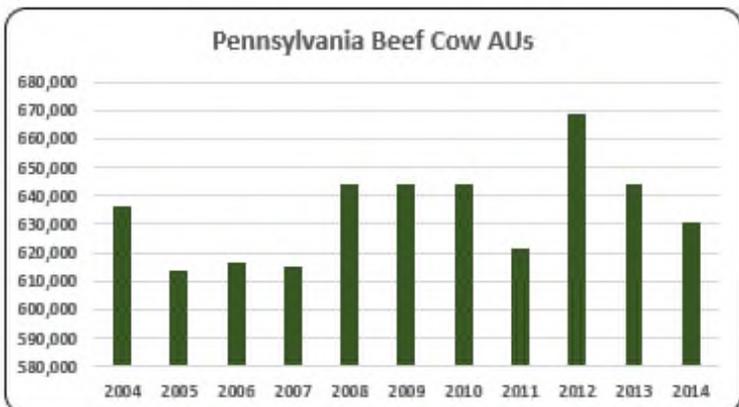
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production was the largest animal production in the state during the last decade with 767,200 dairy cow AUs, on average. Overall, dairy cow production decreased 6% with 742,000 dairy cow AUs in 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production was the second largest production in the state of Pennsylvania from 2004 to 2014. The average number of beef cow AUs was 634,293 during that period, but beef cow AUs declined 1% during the last decade.

Pennsylvania Additional Information and Methodology

Animal agriculture is an important part of Pennsylvania's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Pennsylvania, of interest is the degree to which the industry impacts the Pennsylvania economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Pennsylvania animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Pennsylvania's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Pennsylvania which have occurred. As shown in this state report, Pennsylvania has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Pennsylvania. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Pennsylvania Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Pennsylvania's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Pennsylvania, \$1.773 to \$2.440 million in total economic activity, \$0.314 to \$0.435 in household wages and 12 to 15 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.8879 | \$ 0.3216 | 12.4 |
| | Hogs, Pigs, and Other | \$ 1.7734 | \$ 0.3144 | 12.4 |
| | Poultry and Eggs | \$ 2.4403 | \$ 0.4351 | 13.7 |
| | Dairy | \$ 2.0320 | \$ 0.3764 | 15.1 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 636,150 | 613,650 | 616,500 | 615,300 | 643,800 | 643,800 | 643,800 | 621,150 | 668,670 | 643,875 | 630,525 |
| | Hog and Pig AUs | 316,500 | 311,400 | 319,035 | 317,445 | 259,620 | 268,170 | 322,350 | 303,000 | 319,800 | 317,400 | 312,450 |
| | Broiler AUs | 390,842 | 436,377 | 452,170 | 444,689 | 474,428 | 451,660 | 439,361 | 467,504 | 516,394 | 513,064 | 544,903 |
| | Turkey AUs | 180,000 | 158,332 | 158,368 | 166,091 | 173,617 | 131,879 | 108,252 | 109,551 | 102,254 | 101,380 | 104,966 |
| | Egg Layer AUs | 95,680 | 97,776 | 95,592 | 86,752 | 87,264 | 94,668 | 100,632 | 100,620 | 101,493 | 105,102 | 104,061 |
| | Dairy AUs | 789,600 | 792,400 | 781,200 | 770,000 | 772,800 | 770,000 | 756,000 | 760,200 | 756,000 | 749,000 | 742,000 |
| | Total Animal Units | 2,408,772 | 2,409,934 | 2,422,865 | 2,400,277 | 2,411,529 | 2,360,177 | 2,370,395 | 2,362,025 | 2,464,611 | 2,429,821 | 2,438,906 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 412,965 | \$ 395,912 | \$ 381,645 | \$ 385,260 | \$ 387,801 | \$ 352,719 | \$ 407,598 | \$ 515,506 | \$ 616,659 | \$ 596,590 | \$ 708,834 |
| | Hogs and Pigs (\$1,000) | \$ 224,313 | \$ 221,729 | \$ 198,241 | \$ 191,906 | \$ 160,086 | \$ 159,524 | \$ 251,409 | \$ 308,968 | \$ 315,230 | \$ 327,724 | \$ 383,495 |
| | Broilers (\$1,000) | \$ 325,496 | \$ 359,865 | \$ 306,693 | \$ 381,015 | \$ 429,272 | \$ 399,875 | \$ 404,446 | \$ 399,973 | \$ 481,050 | \$ 580,231 | \$ 635,216 |
| | Turkeys (\$1,000) | \$ 112,320 | \$ 101,357 | \$ 105,462 | \$ 103,532 | \$ 138,368 | \$ 99,990 | \$ 105,228 | \$ 119,691 | \$ 122,137 | \$ 113,582 | \$ 129,140 |
| | Eggs (\$1,000) | \$ 339,744 | \$ 214,188 | \$ 238,351 | \$ 389,119 | \$ 488,056 | \$ 367,224 | \$ 408,227 | \$ 490,511 | \$ 524,878 | \$ 599,377 | \$ 715,299 |
| | Milk (\$1,000) | \$ 1,770,912 | \$ 1,775,007 | \$ 1,568,332 | \$ 2,232,538 | \$ 2,115,000 | \$ 1,519,344 | \$ 1,964,871 | \$ 2,330,887 | \$ 2,095,600 | \$ 2,279,232 | \$ 2,745,531 |
| | Other | \$ 16,299 | \$ 16,353 | \$ 15,324 | \$ 13,619 | \$ 14,093 | \$ 13,290 | \$ 14,078 | \$ 12,719 | \$ 12,219 | \$ 11,718 | \$ 11,217 |
| | Sheep and Lambs (\$1,000) | \$ 7,095 | \$ 7,402 | \$ 6,626 | \$ 5,174 | \$ 5,901 | \$ 5,351 | \$ 6,392 | \$ 5,286 | \$ 5,039 | \$ 4,791 | \$ 4,543 |
| | Aquaculture (\$1,000) | \$ 9,204 | \$ 8,951 | \$ 8,698 | \$ 8,445 | \$ 8,192 | \$ 7,939 | \$ 7,686 | \$ 7,433 | \$ 7,180 | \$ 6,927 | \$ 6,674 |
| | Total (\$1,000) | \$ 3,202,049 | \$ 3,084,411 | \$ 2,814,048 | \$ 3,696,989 | \$ 3,732,676 | \$ 2,911,966 | \$ 3,555,857 | \$ 4,178,255 | \$ 4,167,773 | \$ 4,508,454 | \$ 5,328,732 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 7,083 | 7,677 | 8,350 | 7,665 | |
| | Cattle feedlots (112112) | 2,463 | 3,197 | 1,611 | 726 | |
| | Dairy cattle and milk production (11212) | 9,591 | 8,678 | 7,434 | 6,598 | |
| | Hog and pig farming (1122) | 1,130 | 1,366 | 1,072 | 765 | |
| | Poultry and egg production (1123) | 1,320 | 1,655 | 2,691 | 2,141 | |
| | Sheep and goat farming (1124) | 993 | 1,524 | 2,010 | 2,073 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,947 | 6,736 | 8,062 | 6,868 | |
| Value of Sales (\$1,000) | Cattle and Calves | 372,761 | 441,671 | 556,192 | 717,085 | |
| | Hogs and Pigs | 236,740 | 269,318 | 336,437 | 457,916 | |
| | Poultry and Eggs | 756,800 | 745,624 | 1,015,843 | 1,362,039 | |
| | Milk and Other Dairy Products | 1,330,978 | 1,393,992 | 1,890,190 | 1,966,892 | |
| | Aquaculture | 7,632 | 15,325 | 44,519 | 26,123 | |
| | Other (calculated) | 89,814 | 70,115 | 95,916 | 49,123 | |
| | Total | 2,794,725 | 2,936,045 | 3,939,097 | 4,579,178 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 16,075 | 17,996 | 15,367 | 18,409 | |
| | | \$1,000 | 290,987 | 333,396 | 482,913 | 502,633 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 8,990 | 6,716 | 8,489 | |
| | | \$1,000 | <i>n/a</i> | 66,562 | 76,826 | 114,511 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 11,417 | 10,712 | 12,736 | |
| | | \$1,000 | <i>n/a</i> | 266,834 | 406,087 | 388,122 |
| Feed purchased | (Farms) | 26,901 | 36,011 | 32,576 | 37,228 | |
| | \$1,000 | 973,221 | 937,355 | 1,267,184 | 1,832,951 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|----------------------|---------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,338,208 | \$ 227,961 | 8,769 | \$ 53,343 |
| | Hogs, Pigs, and Other | \$ 699,983 | \$ 124,098 | 4,909 | \$ 29,039 |
| | Poultry and Eggs | \$ 3,610,802 | \$ 643,798 | 20,226 | \$ 150,649 |
| | Dairy | \$ 5,578,919 | \$ 1,033,418 | 41,504 | \$ 241,820 |
| | Total | \$ 11,227,912 | \$ 2,029,274 | 75,408 | \$ 474,850 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 361,140 | \$ 61,520 | 2,366 | \$ 14,396 |
| | Hogs, Pigs, and Other | \$ 165,226 | \$ 29,292 | 1,159 | \$ 6,854 |
| | Poultry and Eggs | \$ 1,232,815 | \$ 219,808 | 6,906 | \$ 51,435 |
| | Dairy | \$ 1,069,163 | \$ 198,048 | 7,954 | \$ 46,343 |
| | Total | \$ 2,828,344 | \$ 508,668 | 18,385 | \$ 119,028 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.8879 | \$ 0.3216 | 12.4 | |
| | Hogs, Pigs, and Other | \$ 1.7734 | \$ 0.3144 | 12.4 | |
| | Poultry and Eggs | \$ 2.4403 | \$ 0.4351 | 13.7 | |
| | Dairy | \$ 2.0320 | \$ 0.3764 | 15.1 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 3.1% |
| | Total | | | | 23.4% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: RHODE ISLAND

Rhode Island Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Rhode Island's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Rhode Island. The success of Rhode Island animal agriculture in turn has a small impact on the rest of the state and regional economies. For example, in the state of Rhode Island during 2014 animal agriculture contributed:

- \$53.7 million in economic output
- 267 jobs
- \$8.6 million in earnings
- \$2.2 million in income taxes paid at local, state, and federal levels
- \$7.4 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Rhode Island increased economic output by over \$30.9 million, boosted household earnings by \$4.9 million, contributed 158 additional jobs and paid \$1.2 million in additional tax revenues.

Rhode Island's animal agriculture consumed about 4,000 tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Turkeys (2,200 tons)
- Companion Animals (800 tons)
- Egg-Laying Hens (600 tons)

This report examines animal agriculture in Rhode Island over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Rhode Island, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a minor contributor to the economic well-being of the people of Rhode Island.

Rhode Island Economic Impact of Animal Agriculture

Animal agriculture is a small part of Rhode Island's economy. In 2014, Rhode Island's animal agriculture contributed the following to the economy:

- About \$53.7 million in economic output
- \$8.6 million in household earnings
- 267 jobs
- \$2.2 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade Rhode Island's animal agriculture has:

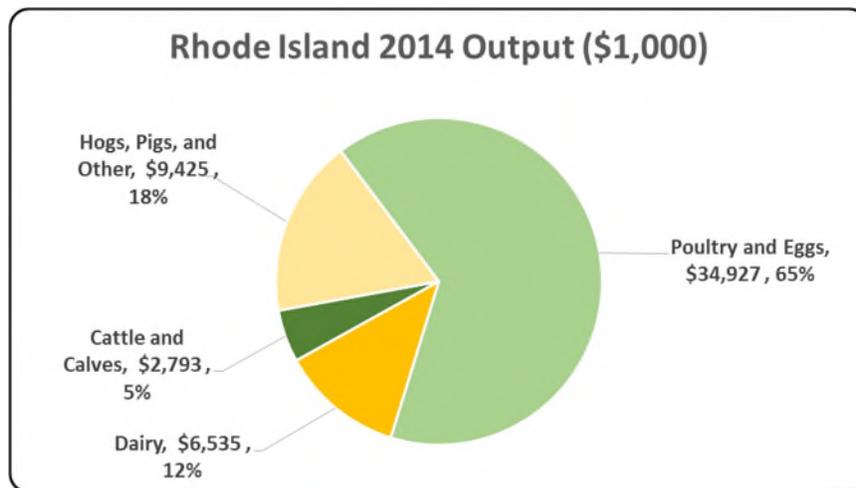
- Increased economic output by \$30.9 million
- Boosted household earnings by \$4.9 million
- Added 158 jobs
- Paid an additional \$1.2 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|-----------|------------------|--------------------|
| Output (\$1,000) | \$ 53,681 | \$ 30,912 | 135.76% |
| Earnings (\$1,000) | \$ 8,578 | \$ 4,911 | 133.92% |
| Employment (Jobs) | 267 | 158 | 144.97% |
| Income Taxes Paid (\$1,000) | \$ 2,151 | \$ 1,232 | 133.92% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 7,365 | | |

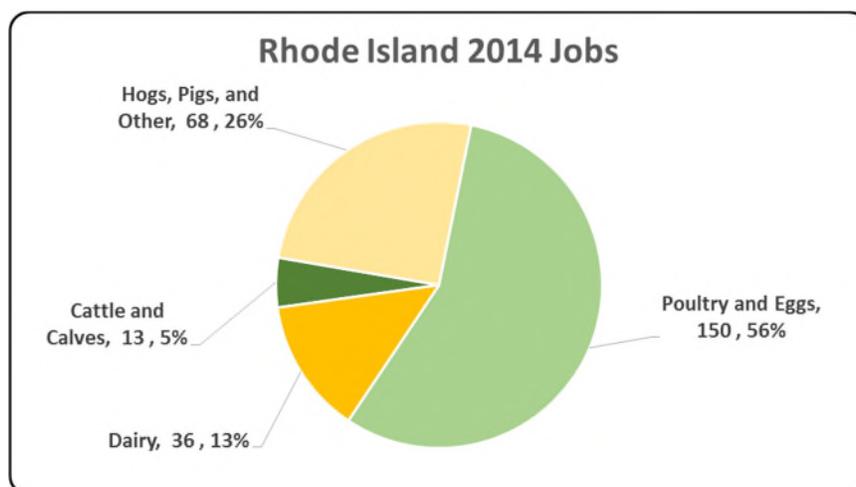
Rhode Island Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Rhode Island economy. Animal agriculture’s impact on Rhode Island total economic output is about \$53.7 million.



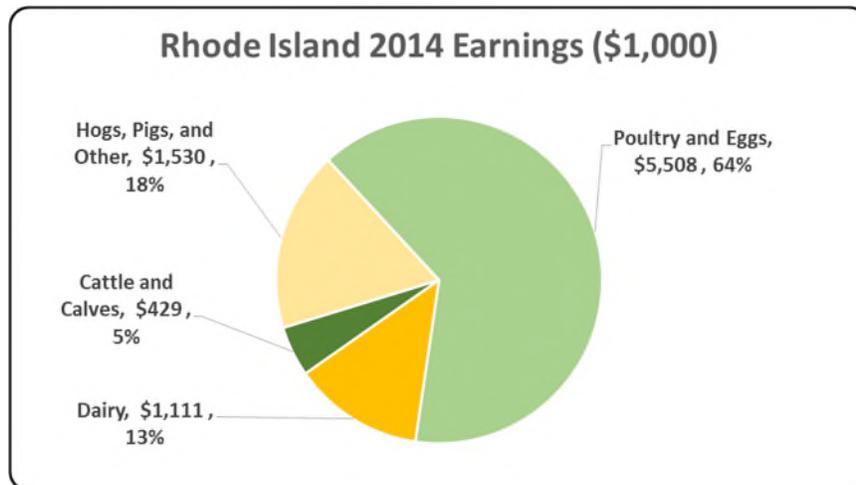
Rhode Island Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Rhode Island in terms of animal agriculture jobs. As shown, animal agriculture contributes about 267 jobs within and outside of animal agriculture.



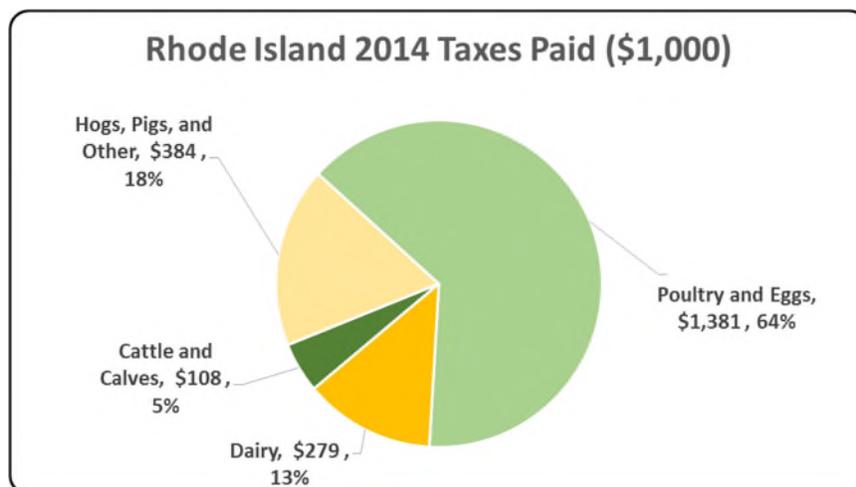
Rhode Island Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Rhode Island economy in terms of earnings. Rhode Island’s animal agriculture contributed about \$8.6 million to household earnings in 2014.



Rhode Island Taxes Paid by Animal Agriculture

Rhode Island’s animal agriculture is also a small source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$2.2 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$7.4 million in property taxes paid by all of Rhode Island agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



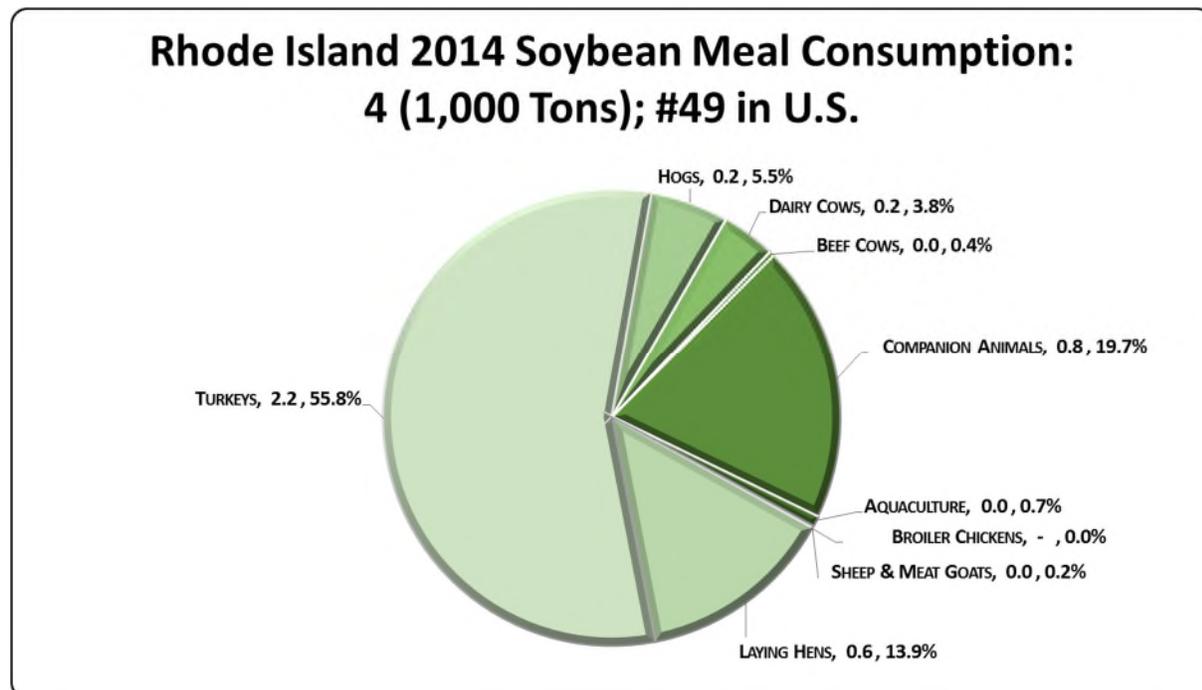
Rhode Island Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Rhode Island's animal agriculture consumed almost 4,000 tons of soybean meal in 2014, placing the state as #49 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Turkeys (2,200 tons)
- Companion Animals (800 tons)
- Egg-Laying Hens (600 tons)

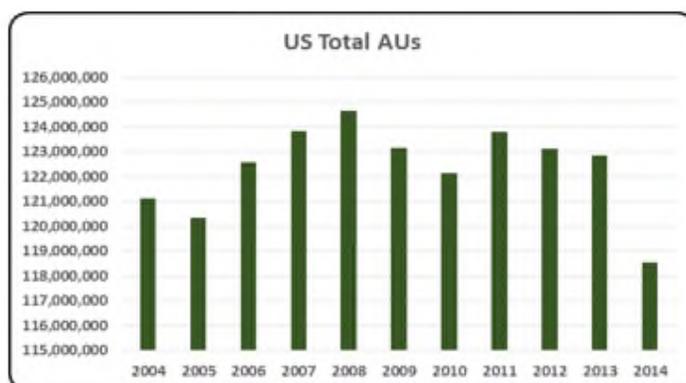


Rhode Island Animal Unit (AU) Trends

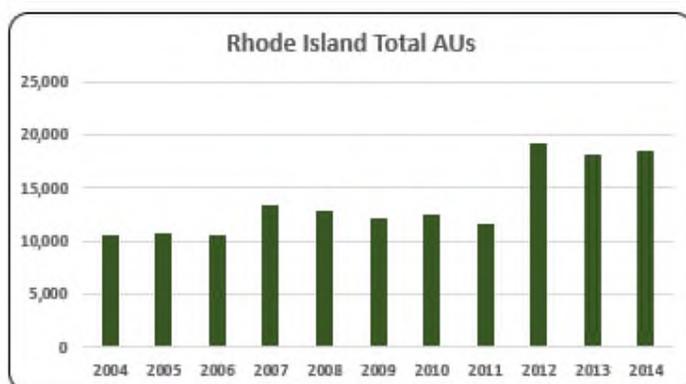
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Rhode Island. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Rhode Island and to give perspective on Rhode Island's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

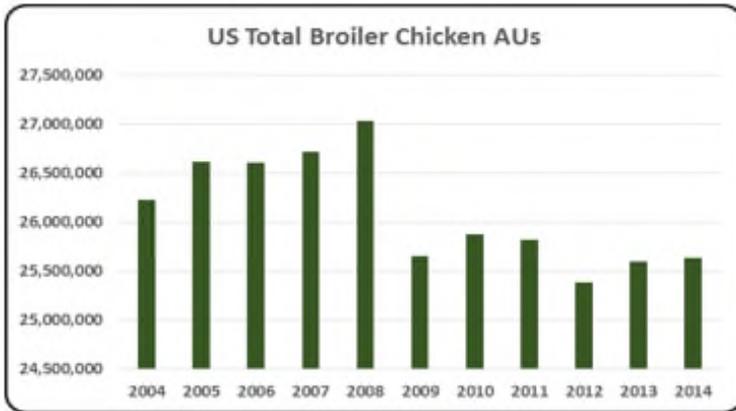
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Rhode Island, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (10.3 thousand AUs), Turkeys (4.0 thousand AUs), and Beef Cows (1.9 thousand AUs). Total animal units in Rhode Island during 2014 were 18.5 thousand AUs.



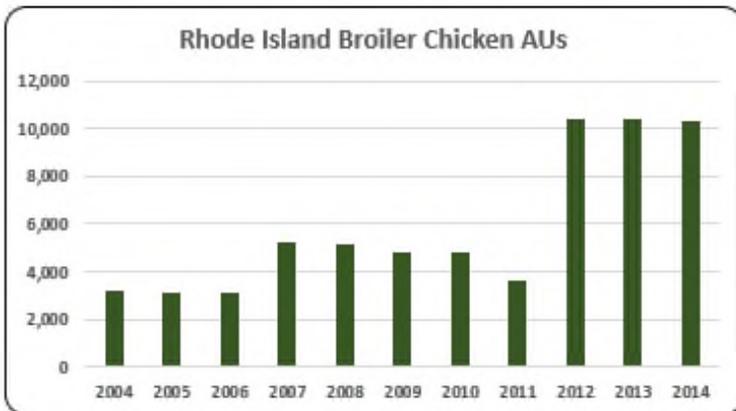
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



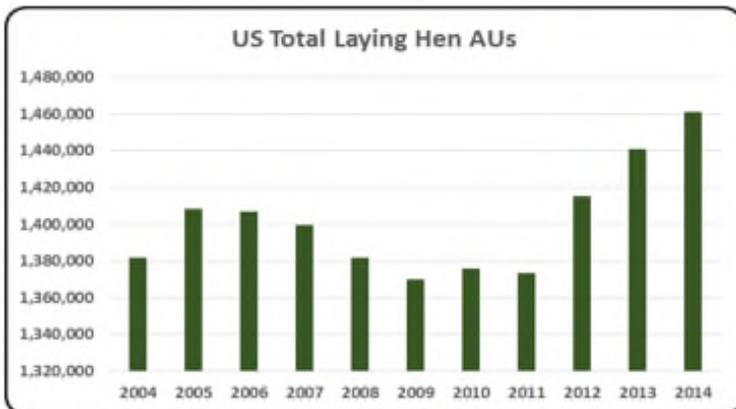
- Rhode Island has a very little animal production contributing only 0.02% (18,542) of all AUs in the U.S. in 2014.



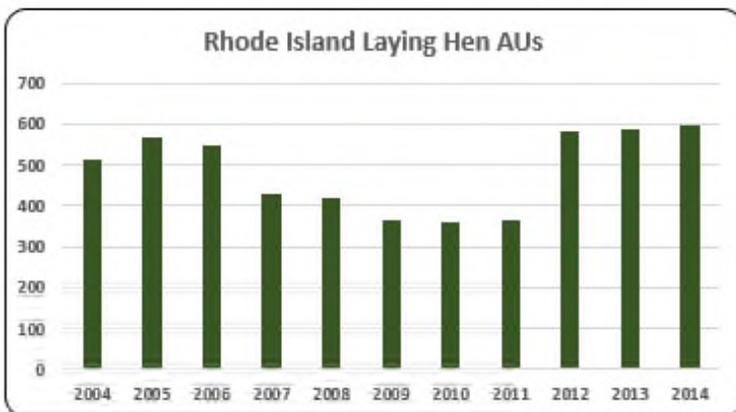
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).



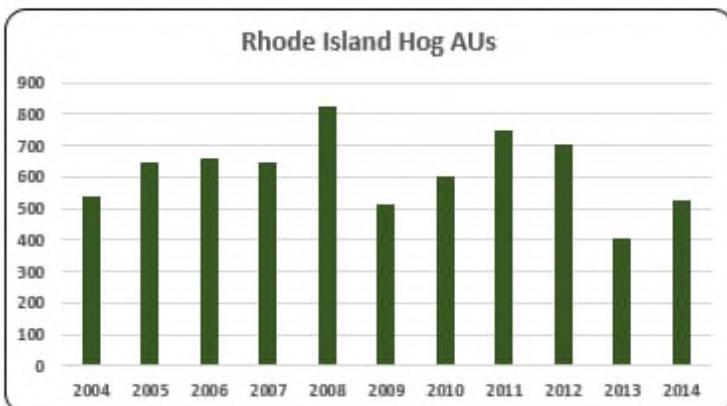
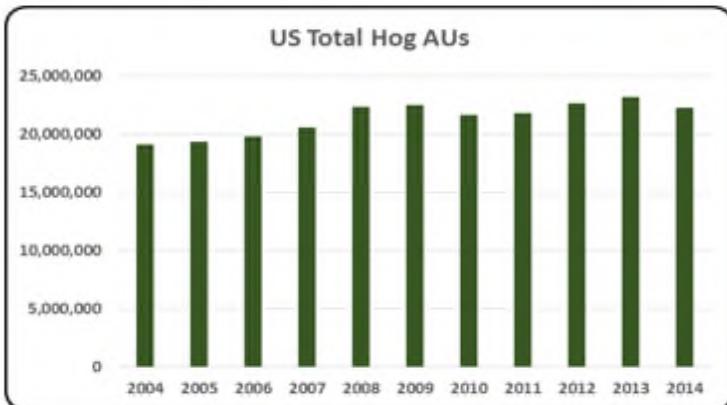
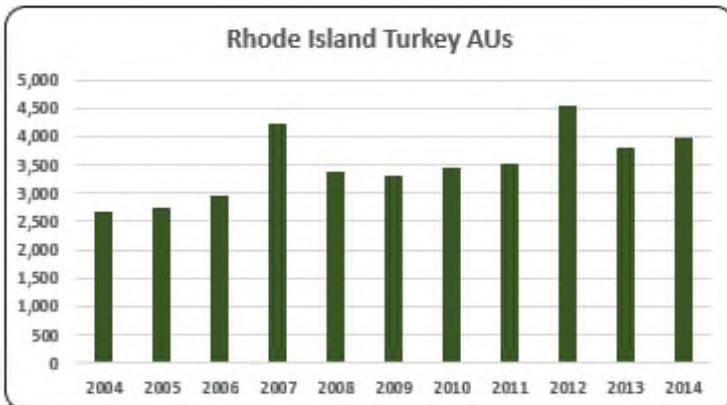
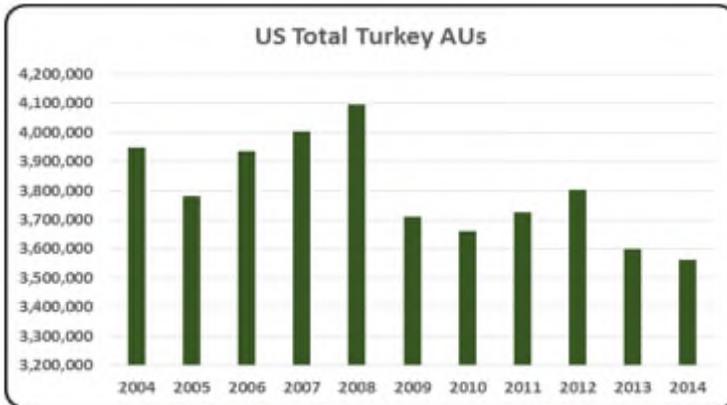
- Broiler production is the largest animal production in Rhode Island with 55.6% of all animal production in the state in 2014. There were 10,303 broiler AUs in the state in 2014.



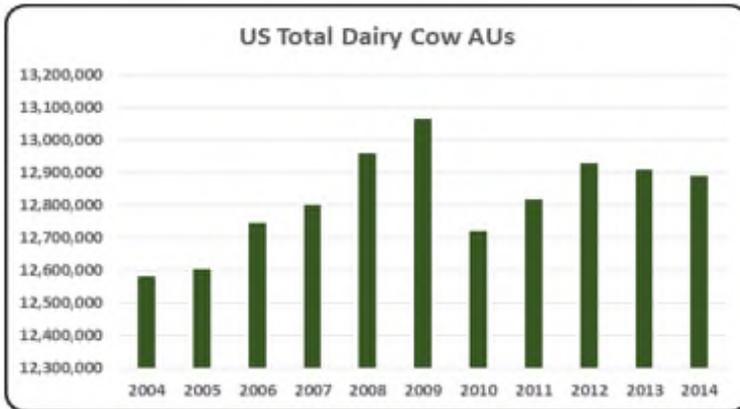
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).



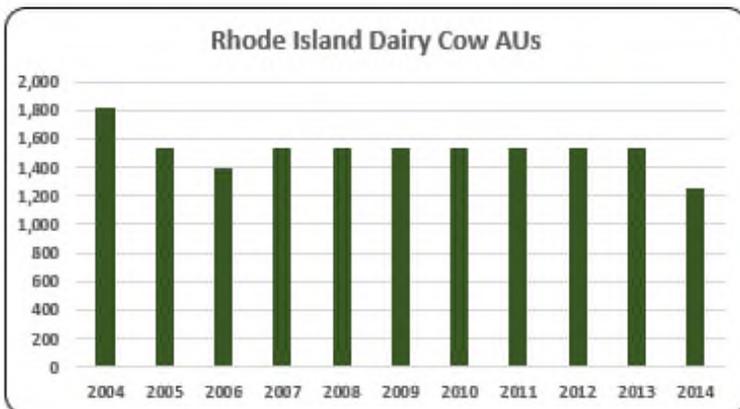
- There were 598 layer AUs in Rhode Island in 2014. Production increased 16% from 2004 to 2014.



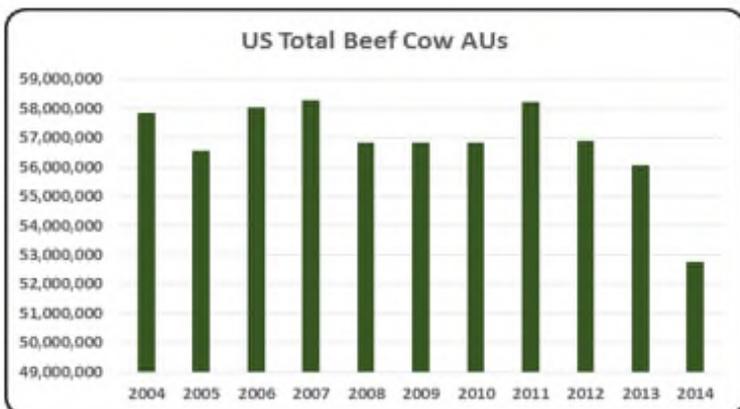
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- On average, there were 3,505 turkey AUs from 2004 to 2014. Similar to broiler production, 2012 was also a record year for turkey production with 4,553 turkey AUs.
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production was the smallest animal production in the state with an average of 619 hog AUs during last decade.



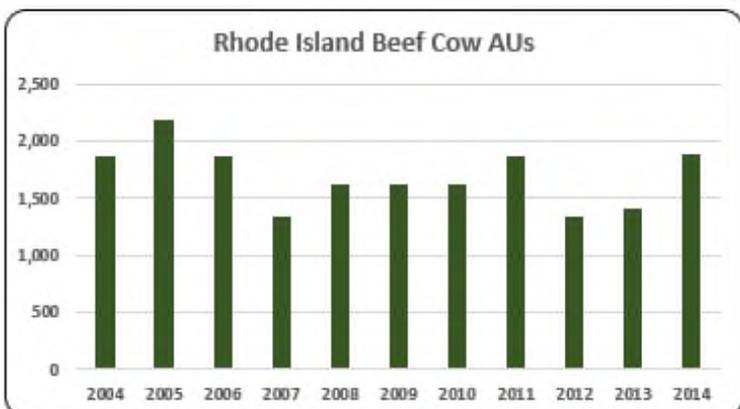
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy production declined 30.8% from 2004 to 2014. On average there were 1,527 dairy cow AUs in the last decade.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Ten percent (1,890) of all Rhode Island AUs were in the beef cow production in 2014. Beef cow AUs grew 1.6% in the last decade.

Rhode Island Additional Information and Methodology

Animal agriculture is a small part of Rhode Island's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Rhode Island, of interest is the degree to which the industry impacts the Rhode Island economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Rhode Island animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Rhode Island's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Rhode Island which have occurred. As shown in this state report, Rhode Island has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Rhode Island. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Rhode Island Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Rhode Island's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Rhode Island, \$1.369 to \$1.448 million in total economic activity, \$0.220 to \$0.246 in household wages and 6 to 10 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.4339 | \$ 0.2202 | 6.7 |
| | Hogs, Pigs, and Other | \$ 1.3694 | \$ 0.2223 | 9.9 |
| | Poultry and Eggs | \$ 1.3950 | \$ 0.2200 | 6.0 |
| | Dairy | \$ 1.4477 | \$ 0.2461 | 7.9 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,860 | 2,190 | 1,860 | 1,335 | 1,620 | 1,620 | 1,620 | 1,860 | 1,335 | 1,410 | 1,890 |
| | Hog and Pig AUs | 540 | 645 | 660 | 645 | 825 | 510 | 600 | 750 | 705 | 405 | 525 |
| | Broiler AUs | 3,197 | 3,130 | 3,109 | 5,227 | 5,145 | 4,784 | 4,848 | 3,653 | 10,398 | 10,362 | 10,303 |
| | Turkey AUs | 2,660 | 2,728 | 2,964 | 4,230 | 3,381 | 3,312 | 3,450 | 3,511 | 4,553 | 3,798 | 3,966 |
| | Egg Layer AUs | 514 | 567 | 547 | 429 | 417 | 364 | 362 | 364 | 579 | 588 | 598 |
| | Dairy AUs | 1,820 | 1,540 | 1,400 | 1,540 | 1,540 | 1,540 | 1,540 | 1,540 | 1,540 | 1,540 | 1,260 |
| | Total Animal Units | 10,591 | 10,799 | 10,540 | 13,405 | 12,928 | 12,130 | 12,420 | 11,678 | 19,110 | 18,103 | 18,542 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 909 | \$ 927 | \$ 1,037 | \$ 911 | \$ 834 | \$ 738 | \$ 706 | \$ 1,029 | \$ 1,452 | \$ 1,512 | \$ 1,948 |
| | Hogs and Pigs (\$1,000) | \$ 374 | \$ 406 | \$ 341 | \$ 266 | \$ 289 | \$ 176 | \$ 275 | \$ 364 | \$ 368 | \$ 361 | \$ 537 |
| | Broilers (\$1,000) | \$ 2,689 | \$ 2,547 | \$ 1,968 | \$ 3,932 | \$ 4,047 | \$ 3,505 | \$ 3,689 | \$ 3,251 | \$ 10,358 | \$ 12,619 | \$ 13,238 |
| | Turkeys (\$1,000) | \$ 2,468 | \$ 2,617 | \$ 3,093 | \$ 4,878 | \$ 4,567 | \$ 3,063 | \$ 4,103 | \$ 4,602 | \$ 6,603 | \$ 4,348 | \$ 7,280 |
| | Eggs (\$1,000) | \$ 2,701 | \$ 1,635 | \$ 1,813 | \$ 2,975 | \$ 3,586 | \$ 2,552 | \$ 2,801 | \$ 3,072 | \$ 3,445 | \$ 3,892 | \$ 4,519 |
| | Milk (\$1,000) | \$ 3,508 | \$ 3,142 | \$ 2,812 | \$ 3,819 | \$ 4,000 | \$ 2,783 | \$ 3,510 | \$ 4,314 | \$ 3,623 | \$ 3,728 | \$ 4,514 |
| | Other | \$ 228 | \$ 840 | \$ 1,452 | \$ 2,064 | \$ 2,675 | \$ 3,287 | \$ 3,899 | \$ 4,511 | \$ 5,122 | \$ 5,734 | \$ 6,346 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 228 | \$ 840 | \$ 1,452 | \$ 2,064 | \$ 2,675 | \$ 3,287 | \$ 3,899 | \$ 4,511 | \$ 5,122 | \$ 5,734 | \$ 6,346 |
| | Total (\$1,000) | \$ 12,877 | \$ 12,114 | \$ 12,516 | \$ 18,845 | \$ 19,997 | \$ 16,104 | \$ 18,984 | \$ 21,142 | \$ 30,971 | \$ 32,194 | \$ 38,382 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------|--------------|---------------|---------------|-------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 67 | 78 | 102 | 154 | |
| | Cattle feedlots (112112) | 18 | 12 | 8 | 7 | |
| | Dairy cattle and milk production (11212) | 32 | 30 | 34 | 13 | |
| | Hog and pig farming (1122) | 22 | 20 | 31 | 20 | |
| | Poultry and egg production (1123) | 21 | 26 | 49 | 88 | |
| | Sheep and goat farming (1124) | 24 | 30 | 53 | 54 | |
| | Animal aquaculture and other animal production (1125,1129) | 78 | 148 | 237 | 244 | |
| Value of Sales (\$1,000) | Cattle and Calves | 778 | 735 | 846 | 1,180 | |
| | Hogs and Pigs | 758 | 227 | 354 | 601 | |
| | Poultry and Eggs | 2,020 | 1,766 | 1,908 | 2,177 | |
| | Milk and Other Dairy Products | 4,875 | 3,859 | 4,599 | 3,902 | |
| | Aquaculture | n/a | 863 | 1,653 | 1,917 | |
| | Other (calculated) | 1,230 | 958 | 946 | 513 | |
| | Total | 9,661 | 8,408 | 10,306 | 10,290 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 161 | 169 | 203 | 349 |
| | | \$1,000 | 848 | 730 | 748 | 1,023 |
| | Breeding livestock purchased | (Farms) | n/a | 75 | 90 | 136 |
| | | \$1,000 | n/a | 118 | 214 | 314 |
| | Other livestock and poultry purchased | (Farms) | n/a | 122 | 143 | 287 |
| | | \$1,000 | n/a | 612 | 534 | 709 |
| | Feed purchased | (Farms) | 271 | 425 | 583 | 693 |
| | | \$1,000 | 2,924 | 3,121 | 5,171 | 6,287 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 2,793 | \$ 429 | 13 | \$ 108 |
| | Hogs, Pigs, and Other | \$ 9,425 | \$ 1,530 | 68 | \$ 384 |
| | Poultry and Eggs | \$ 34,927 | \$ 5,508 | 150 | \$ 1,381 |
| | Dairy | \$ 6,535 | \$ 1,111 | 36 | \$ 279 |
| | Total | \$ 53,681 | \$ 8,578 | 267 | \$ 2,151 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 1,160 | \$ 178 | 5 | \$ 45 |
| | Hogs, Pigs, and Other | \$ 8,392 | \$ 1,362 | 61 | \$ 342 |
| | Poultry and Eggs | \$ 21,190 | \$ 3,342 | 91 | \$ 838 |
| | Dairy | \$ 170 | \$ 29 | 1 | \$ 7 |
| | Total | \$ 30,912 | \$ 4,911 | 158 | \$ 1,232 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 1.4339 | \$ 0.2202 | 6.7 | |
| | Hogs, Pigs, and Other | \$ 1.3694 | \$ 0.2223 | 9.9 | |
| | Poultry and Eggs | \$ 1.3950 | \$ 0.2200 | 6.0 | |
| | Dairy | \$ 1.4477 | \$ 0.2461 | 7.9 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 4.8% | |
| | Total | | | 25.1% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: SOUTH CAROLINA

South Carolina Executive Summary

The use of soybean meal as a key feed ingredient is an important part of South Carolina's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in South Carolina. The success of South Carolina animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of South Carolina during 2014 animal agriculture contributed:

- \$3.1 billion in economic output
- 20,354 jobs
- \$538.6 million in earnings
- \$147.2 million in income taxes paid at local, state, and federal levels
- \$43.3 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in South Carolina increased economic output by over \$479.4 million, boosted household earnings by \$82.4 million, contributed 3,009 additional jobs and paid \$22.5 million in additional tax revenues.

South Carolina's animal agriculture consumed about 334.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (271.4 thousand tons)
- Egg-Laying Hens (22.4 thousand tons)
- Hogs (16.2 thousand tons)

This report examines animal agriculture in South Carolina over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in South Carolina, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of South Carolina and beyond.

South Carolina Economic Impact of Animal Agriculture

Animal agriculture is an integral part of South Carolina's economy. In 2014, South Carolina's animal agriculture contributed the following to the economy:

- About \$3.1 billion in economic output
- \$538.6 million in household earnings
- 20,354 jobs
- \$147.2 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade South Carolina's animal agriculture has:

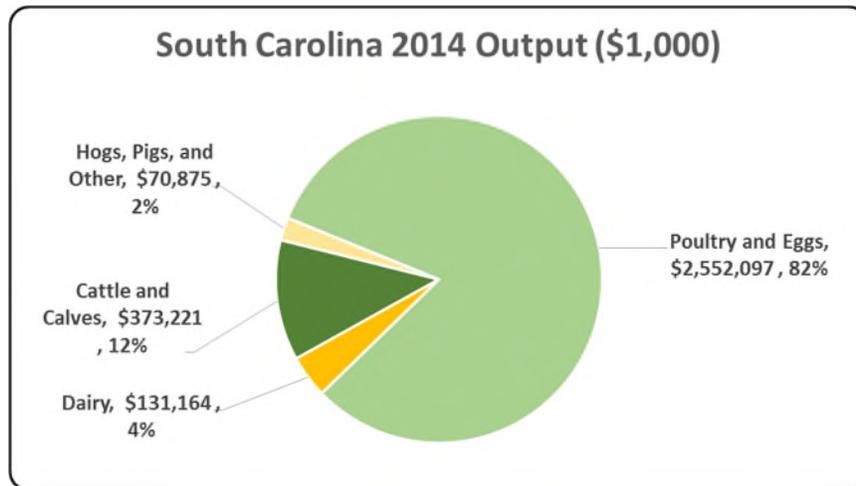
- Increased economic output by \$479.4 million
- Boosted household earnings by \$82.4 million
- Added 3,009 jobs
- Paid an additional \$22.5 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 3,127,358 | \$ 479,358 | 18.10% |
| Earnings (\$1,000) | \$ 538,607 | \$ 82,408 | 18.06% |
| Employment (Jobs) | 20,354 | 3,009 | 17.35% |
| Income Taxes Paid (\$1,000) | \$ 147,201 | \$ 22,522 | 18.06% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 43,314 | | |

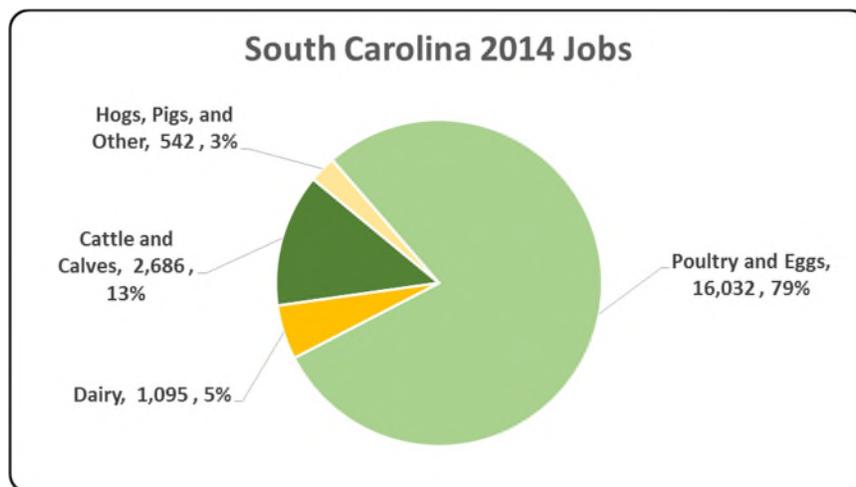
South Carolina Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the South Carolina economy. Animal agriculture’s impact on South Carolina total economic output is about \$3.1 billion.



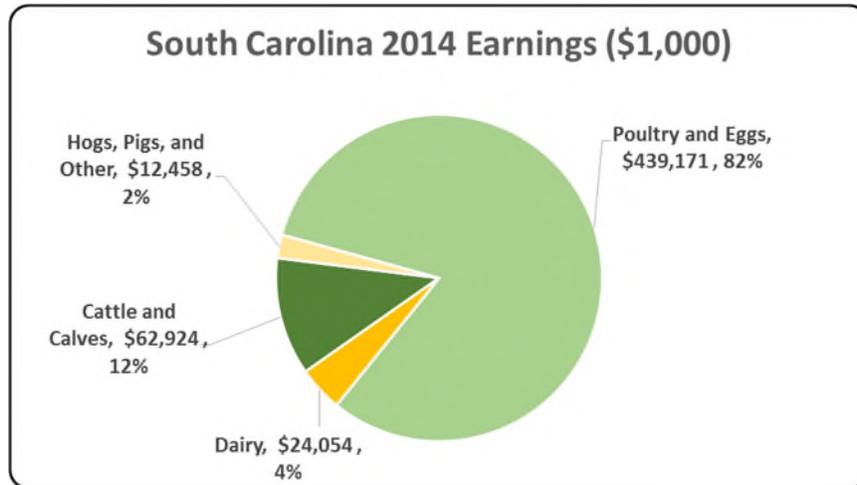
South Carolina Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to South Carolina in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to South Carolina total jobs, contributing 20,354 jobs within and outside of animal agriculture.



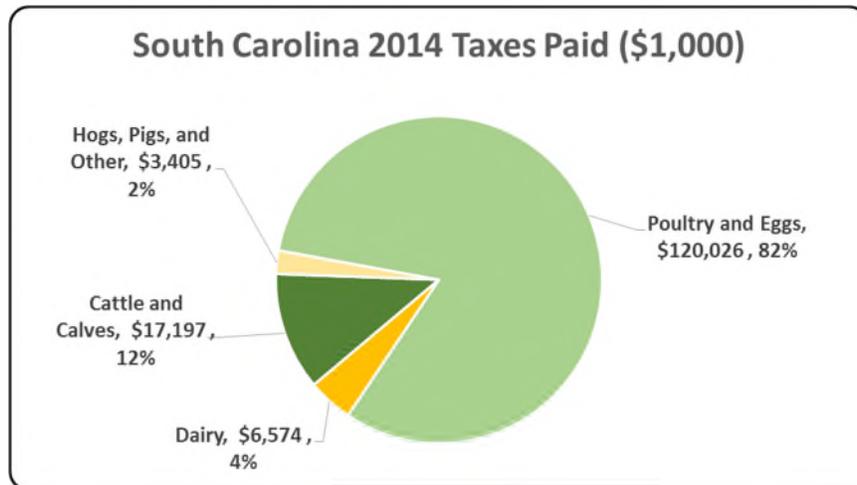
South Carolina Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the South Carolina economy in terms of earnings. South Carolina’s animal agriculture contributed about \$538.6 million to household earnings in 2014.



South Carolina Taxes Paid by Animal Agriculture

South Carolina’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$147.2 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$43.3 million in property taxes paid by all of South Carolina agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



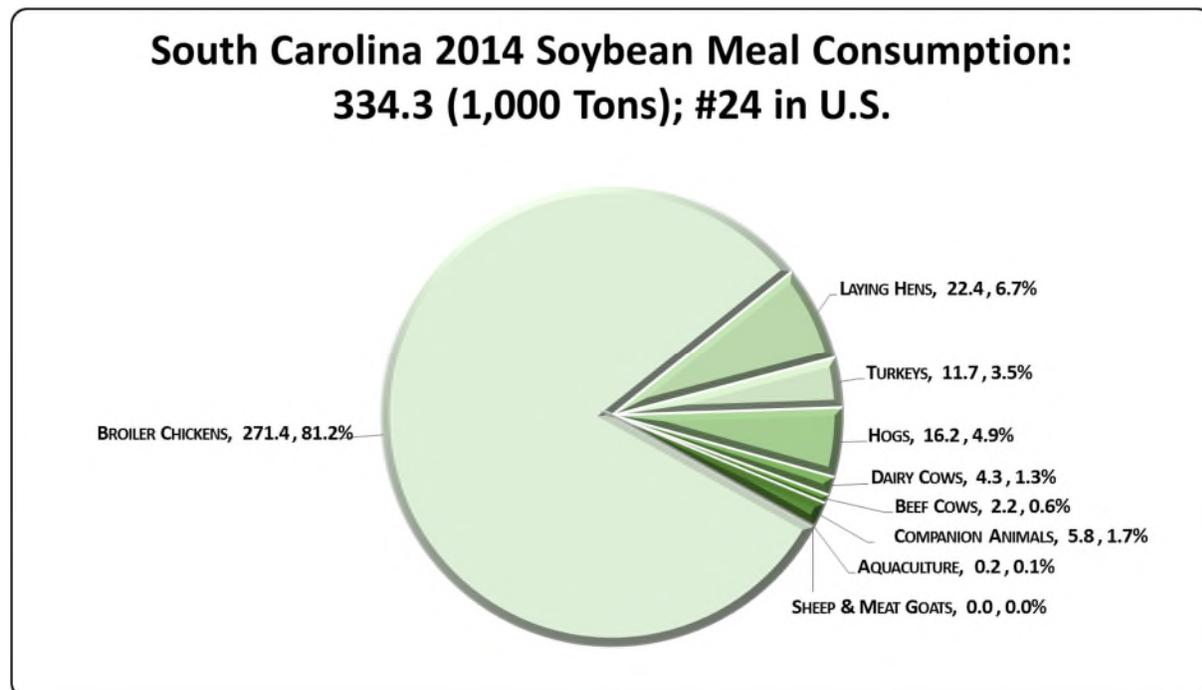
South Carolina Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

South Carolina's animal agriculture consumed almost 334.3 thousand tons of soybean meal in 2014, placing the state as #24 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

1. Broilers (271.4 thousand tons)
2. Egg-Laying Hens (22.4 thousand tons)
3. Hogs (16.2 thousand tons)

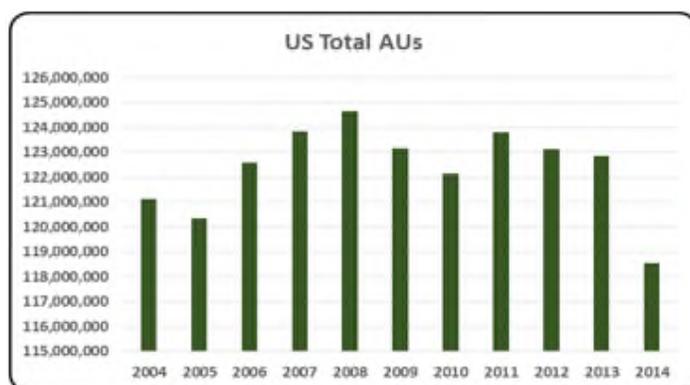


South Carolina Animal Unit (AU) Trends

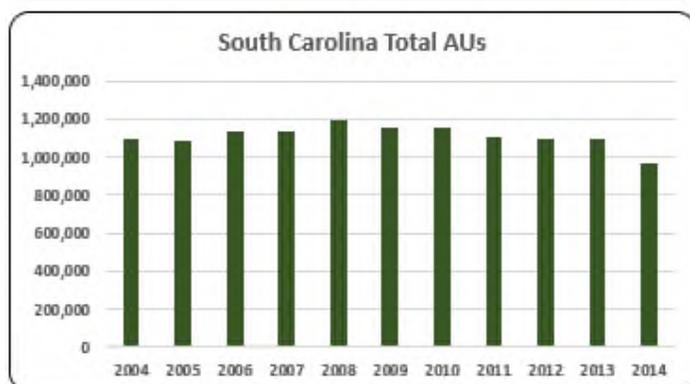
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of South Carolina. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to South Carolina and to give perspective on South Carolina's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

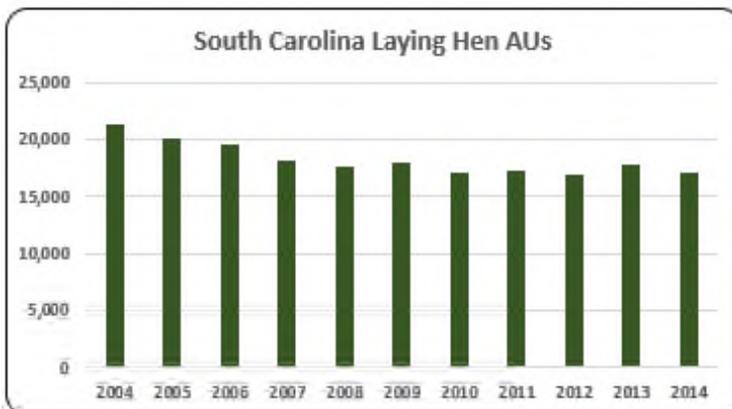
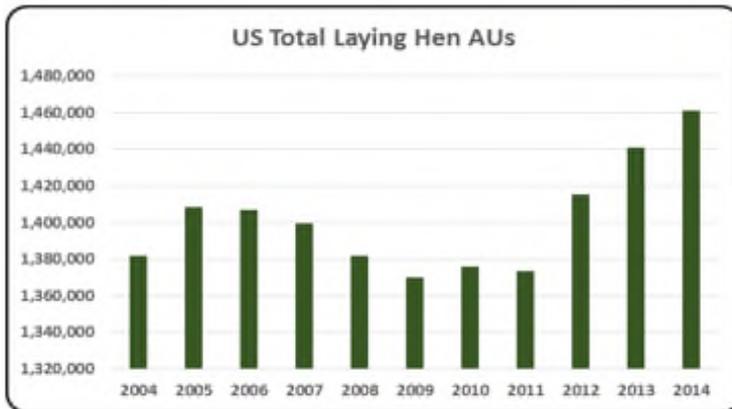
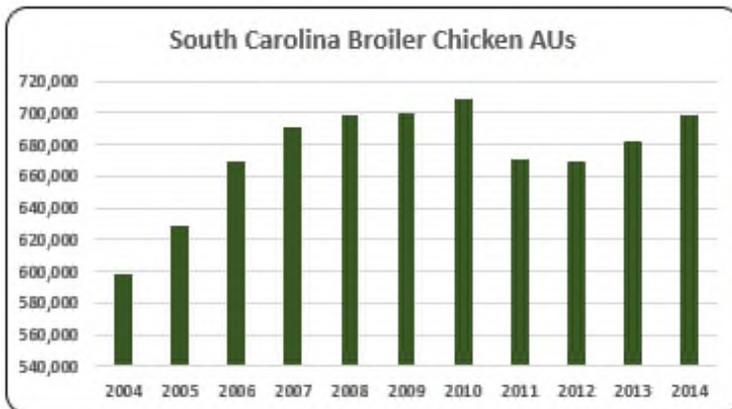
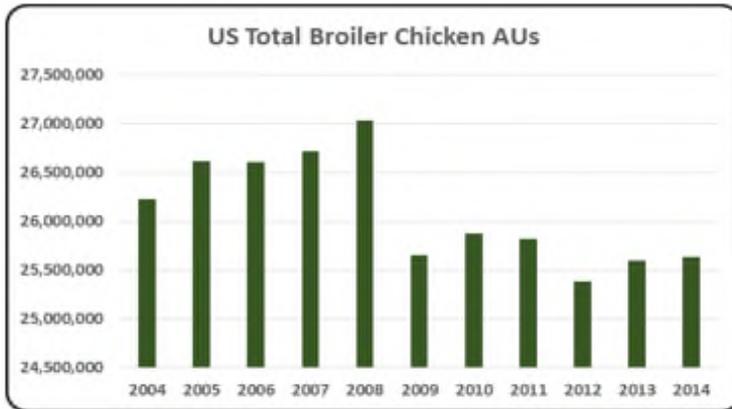
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In South Carolina, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (698.8 thousand AUs), Beef Cows (169.2 thousand AUs), and Hogs (39.7 thousand AUs). Total animal units in South Carolina during 2014 were 967.9 thousand AUs.



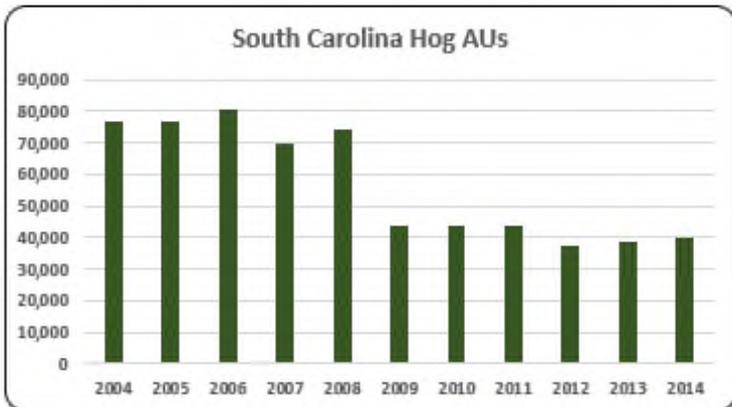
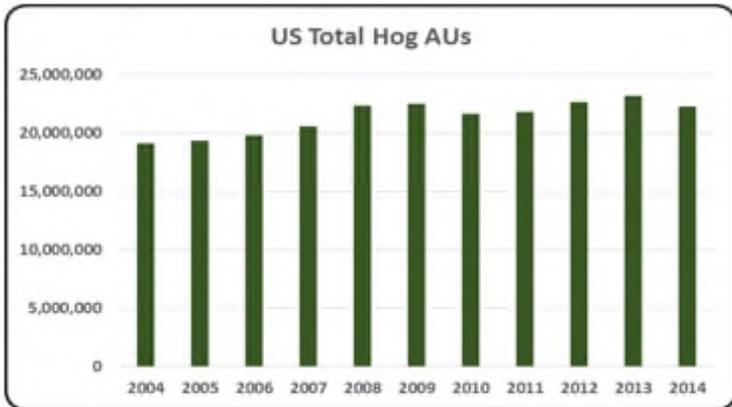
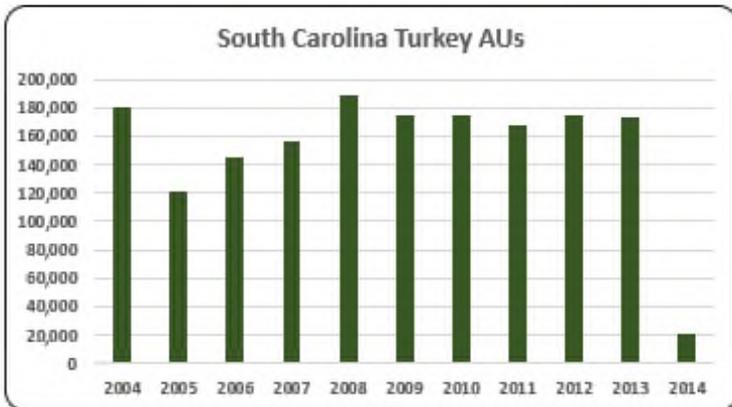
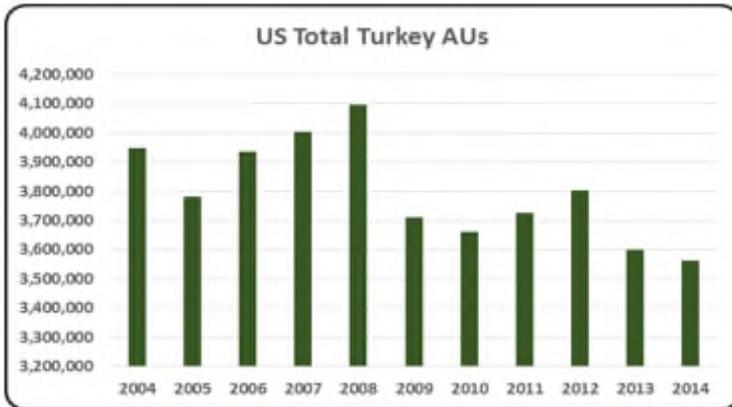
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



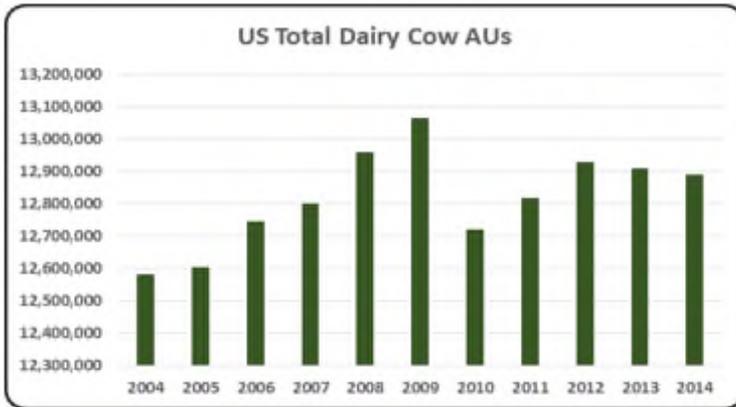
- Animal production in South Carolina fell 11.9% to 967,857 AUs in 2014 year-over-year. There was an 11.6% AU decline during last decade.



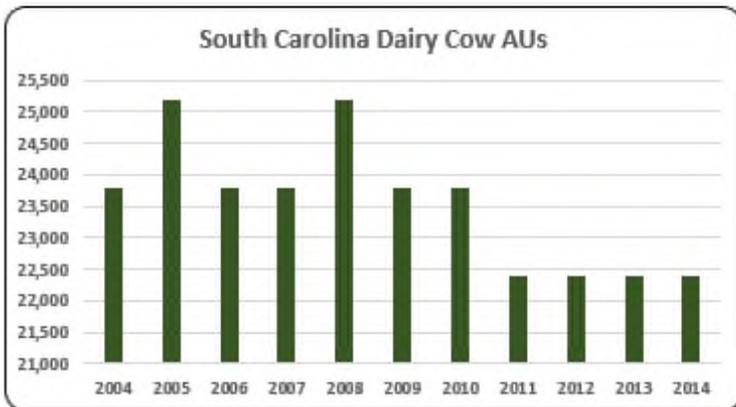
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production contributed 72% (698,787 broiler AUs) percent of total AUs in the state in 2014. Broiler production increased 16.7% from 2004 to 2014.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layer production represented only 1.77% (17,114 layer AUs) of all animal production in South Carolina in 2014. Layer production in 2014 decreased 20% compared to 2004.



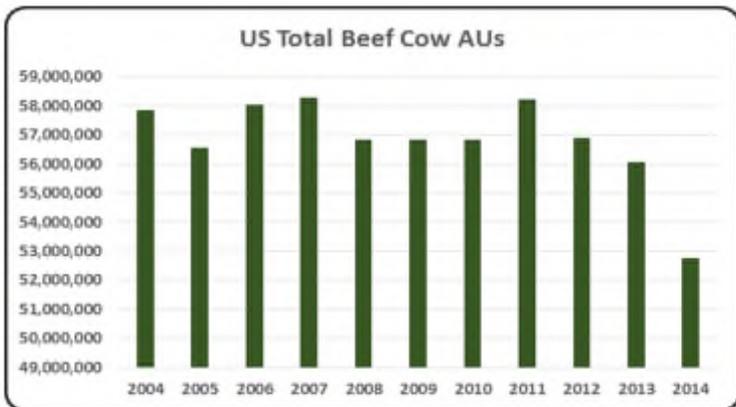
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- 2014 turkey production (20,682 turkey AUs) experienced a large decline (88.5%) compared to the level of production in 2004 (180,000 turkey AUs).
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- The average number of hog AUs from 2004 to 2014 was 56,734. Hog production decreased 48%; from 76,575 hog AUs in 2004 to 39,675 hog AUs in 2014.



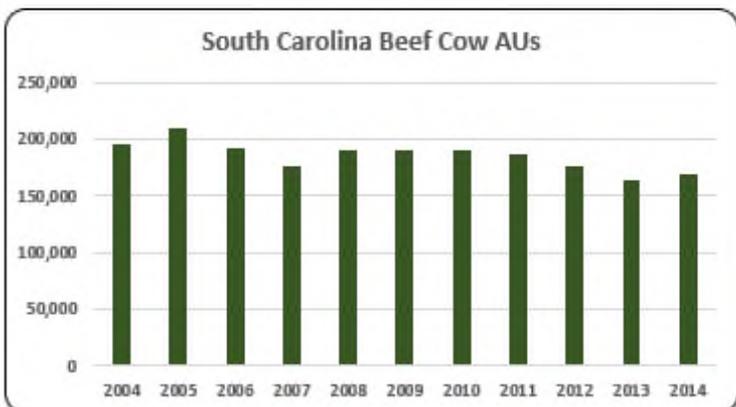
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- From 2011 to 2012 dairy cow AUs held constant. Dairy cow production dropped 6% from 2004 to 2014. South Carolina had record high dairy cow AUs in 2008 with 25,200 dairy cow AUs.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- About 17.5% (169,200) of AUs in 2014 were beef cow AUs. Beef cow production trended downward during last decade showing a 13.2% reduction.

South Carolina Additional Information and Methodology

Animal agriculture is an important part of South Carolina's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in South Carolina, of interest is the degree to which the industry impacts the South Carolina economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for South Carolina animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted South Carolina's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in South Carolina which have occurred. As shown in this state report, South Carolina has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in South Carolina. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

South Carolina Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on South Carolina's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in South Carolina, \$1.674 to \$2.093 million in total economic activity, \$0.294 to \$0.360 in household wages and 13 to 15 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.8565 | \$ 0.3130 | 13.4 |
| | Hogs, Pigs, and Other | \$ 1.6738 | \$ 0.2942 | 12.8 |
| | Poultry and Eggs | \$ 2.0926 | \$ 0.3601 | 13.1 |
| | Dairy | \$ 1.8338 | \$ 0.3363 | 15.3 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 194,850 | 210,000 | 191,700 | 176,850 | 189,450 | 189,450 | 189,450 | 186,600 | 175,350 | 164,400 | 169,200 |
| | Hog and Pig AUs | 76,575 | 76,725 | 80,475 | 69,975 | 74,175 | 43,875 | 43,575 | 43,575 | 37,125 | 38,325 | 39,675 |
| | Broiler AUs | 598,705 | 628,489 | 668,977 | 690,855 | 698,521 | 699,705 | 709,217 | 671,211 | 669,689 | 681,380 | 698,787 |
| | Turkey AUs | 180,000 | 120,634 | 144,793 | 157,032 | 188,714 | 174,373 | 174,081 | 167,978 | 175,293 | 173,795 | 20,682 |
| | Egg Layer AUs | 21,328 | 19,996 | 19,532 | 18,216 | 17,680 | 17,932 | 17,080 | 17,212 | 16,956 | 17,754 | 17,114 |
| | Dairy AUs | 23,800 | 25,200 | 23,800 | 23,800 | 25,200 | 23,800 | 23,800 | 22,400 | 22,400 | 22,400 | 22,400 |
| | Total Animal Units | 1,095,258 | 1,081,043 | 1,129,277 | 1,136,728 | 1,193,740 | 1,149,135 | 1,157,203 | 1,108,976 | 1,096,813 | 1,098,054 | 967,857 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 148,295 | \$ 151,384 | \$ 134,558 | \$ 128,623 | \$ 115,953 | \$ 113,488 | \$ 131,192 | \$ 152,030 | \$ 157,102 | \$ 139,357 | \$ 201,035 |
| | Hogs and Pigs (\$1,000) | \$ 50,790 | \$ 53,833 | \$ 47,967 | \$ 43,174 | \$ 44,605 | \$ 22,035 | \$ 29,016 | \$ 31,544 | \$ 30,712 | \$ 30,992 | \$ 37,706 |
| | Broilers (\$1,000) | \$ 521,884 | \$ 563,112 | \$ 520,960 | \$ 665,955 | \$ 697,452 | \$ 695,508 | \$ 750,426 | \$ 707,549 | \$ 768,650 | \$ 963,248 | \$ 1,051,560 |
| | Turkeys (\$1,000) | \$ 185,280 | \$ 133,472 | \$ 177,523 | \$ 198,474 | \$ 267,400 | \$ 220,912 | \$ 261,324 | \$ 327,837 | \$ 355,597 | \$ 318,402 | \$ 37,962 |
| | Eggs (\$1,000) | \$ 82,772 | \$ 62,133 | \$ 68,135 | \$ 92,809 | \$ 104,178 | \$ 85,739 | \$ 86,243 | \$ 101,561 | \$ 109,457 | \$ 116,175 | \$ 130,060 |
| | Milk (\$1,000) | \$ 49,938 | \$ 47,808 | \$ 42,658 | \$ 67,942 | \$ 69,230 | \$ 51,675 | \$ 56,914 | \$ 63,612 | \$ 57,132 | \$ 60,720 | \$ 71,526 |
| | Other | \$ 4,788 | \$ 4,773 | \$ 4,758 | \$ 4,743 | \$ 4,728 | \$ 4,713 | \$ 4,698 | \$ 4,683 | \$ 4,668 | \$ 4,653 | \$ 4,638 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 4,788 | \$ 4,773 | \$ 4,758 | \$ 4,743 | \$ 4,728 | \$ 4,713 | \$ 4,698 | \$ 4,683 | \$ 4,668 | \$ 4,653 | \$ 4,638 |
| | Total (\$1,000) | \$ 1,043,747 | \$ 1,016,515 | \$ 996,559 | \$ 1,201,720 | \$ 1,303,546 | \$ 1,194,070 | \$ 1,319,813 | \$ 1,388,816 | \$ 1,483,318 | \$ 1,633,547 | \$ 1,534,487 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|---------|---------|-----------|-----------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 7,746 | 7,638 | 6,931 | 5,851 | |
| | Cattle feedlots (112112) | 206 | 282 | 168 | withheld | |
| | Dairy cattle and milk production (11212) | 179 | 211 | 102 | 80 | |
| | Hog and pig farming (1122) | 565 | 436 | 300 | 236 | |
| | Poultry and egg production (1123) | 711 | 836 | 1,226 | 1,238 | |
| | Sheep and goat farming (1124) | 289 | 491 | 859 | 1,100 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,511 | 3,392 | 3,747 | 4,157 | |
| Value of Sales (\$1,000) | Cattle and Calves | 81,970 | 76,146 | 105,282 | 92,352 | |
| | Hogs and Pigs | 68,793 | 61,589 | 77,211 | 93,527 | |
| | Poultry and Eggs | 630,540 | 694,290 | 1,289,876 | 1,476,817 | |
| | Milk and Other Dairy Products | 54,855 | 46,240 | 52,550 | 56,008 | |
| | Aquaculture | 4,630 | 3,173 | 4,775 | 5,138 | |
| | Other (calculated) | n/a | 363 | 24,496 | 6,263 | |
| | Total | | 840,788 | 881,801 | 1,554,190 | 1,730,105 |
| Input Purchases | Livestock and poultry purchased | (Farms) | 4,480 | 4,828 | 4,097 | 4,977 |
| | | \$1,000 | 88,949 | 97,058 | 170,676 | 209,463 |
| | Breeding livestock purchased | (Farms) | n/a | 2,557 | 1,977 | 2,355 |
| | | \$1,000 | n/a | 6,302 | 14,017 | 19,545 |
| | Other livestock and poultry purchased | (Farms) | n/a | 2,654 | 2,613 | 3,309 |
| | | \$1,000 | n/a | 90,756 | 156,659 | 189,918 |
| | Feed purchased | (Farms) | 9,768 | 13,901 | 12,517 | 14,754 |
| | | \$1,000 | 410,005 | 369,275 | 761,414 | 917,181 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|---------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 373,221 | \$ 62,924 | 2,686 | \$ 17,197 |
| | Hogs, Pigs, and Other | \$ 70,875 | \$ 12,458 | 542 | \$ 3,405 |
| | Poultry and Eggs | \$ 2,552,097 | \$ 439,171 | 16,032 | \$ 120,026 |
| | Dairy | \$ 131,164 | \$ 24,054 | 1,095 | \$ 6,574 |
| | Total | \$ 3,127,358 | \$ 538,607 | 20,354 | \$ 147,201 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 28,194 | \$ 4,753 | 203 | \$ 1,299 |
| | Hogs, Pigs, and Other | \$ (45,709) | \$ (8,034) | (349) | \$ (2,196) |
| | Poultry and Eggs | \$ 480,475 | \$ 82,681 | 3,018 | \$ 22,597 |
| | Dairy | \$ 16,398 | \$ 3,007 | 137 | \$ 822 |
| | Total | \$ 479,358 | \$ 82,408 | 3,009 | \$ 22,522 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.8565 | \$ 0.3130 | 13.4 | |
| | Hogs, Pigs, and Other | \$ 1.6738 | \$ 0.2942 | 12.8 | |
| | Poultry and Eggs | \$ 2.0926 | \$ 0.3601 | 13.1 | |
| | Dairy | \$ 1.8338 | \$ 0.3363 | 15.3 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 7.0% | |
| | Total | | | 27.3% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: SOUTH DAKOTA

South Dakota Executive Summary

The use of soybean meal as a key feed ingredient is an important part of South Dakota's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in South Dakota. The success of South Dakota animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of South Dakota during 2014 animal agriculture contributed:

- \$9.1 billion in economic output
- 36,307 jobs
- \$1.4 billion in earnings
- \$294.4 million in income taxes paid at local, state, and federal levels
- \$197.1 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in South Dakota increased economic output by over \$2.7 billion, boosted household earnings by \$439.8 million, contributed 11,045 additional jobs and paid \$89.4 million in additional tax revenues.

South Dakota's animal agriculture consumed about 335.7 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (214.6 thousand tons)
- Beef Cows (43.6 thousand tons)
- Turkeys (38.1 thousand tons)

This report examines animal agriculture in South Dakota over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in South Dakota, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of South Dakota and beyond.

South Dakota Economic Impact of Animal Agriculture

Animal agriculture is an integral part of South Dakota's economy. In 2014, South Dakota's animal agriculture contributed the following to the economy:

- About \$9.1 billion in economic output
- \$1.4 billion in household earnings
- 36,307 jobs
- \$294.4 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade South Dakota's animal agriculture has:

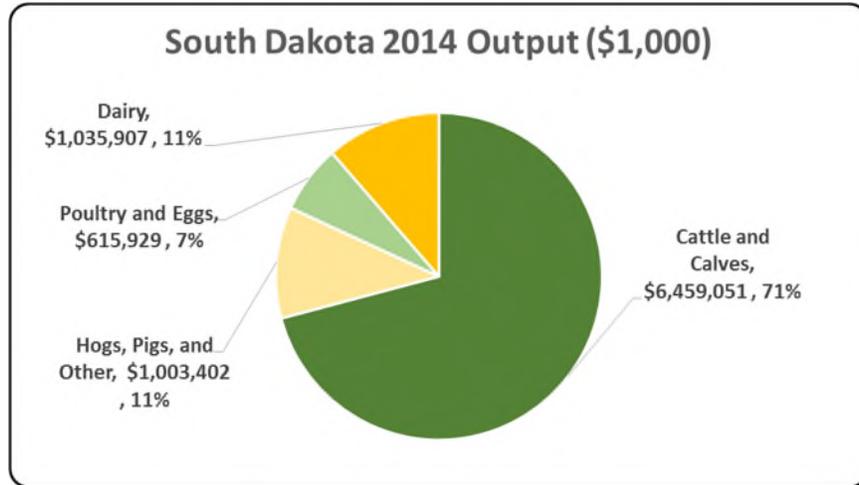
- Increased economic output by \$2.8 billion
- Boosted household earnings by \$439.8 million
- Added 11,045 jobs
- Paid an additional \$89.4 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 9,114,290 | \$ 2,759,447 | 43.42% |
| Earnings (\$1,000) | \$ 1,447,884 | \$ 439,761 | 43.62% |
| Employment (Jobs) | 36,307 | 11,045 | 43.72% |
| Income Taxes Paid (\$1,000) | \$ 294,355 | \$ 89,403 | 43.62% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 197,123 | | |

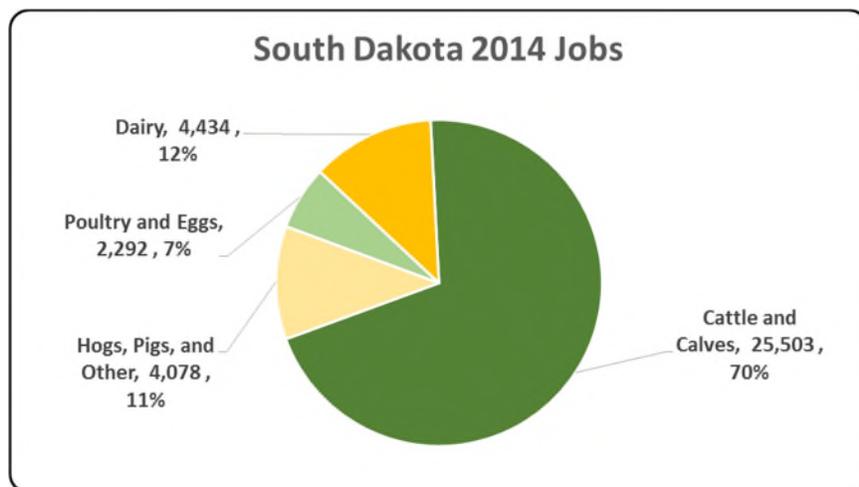
South Dakota Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the South Dakota economy. Animal agriculture’s impact on South Dakota total economic output is about \$9.1 billion.



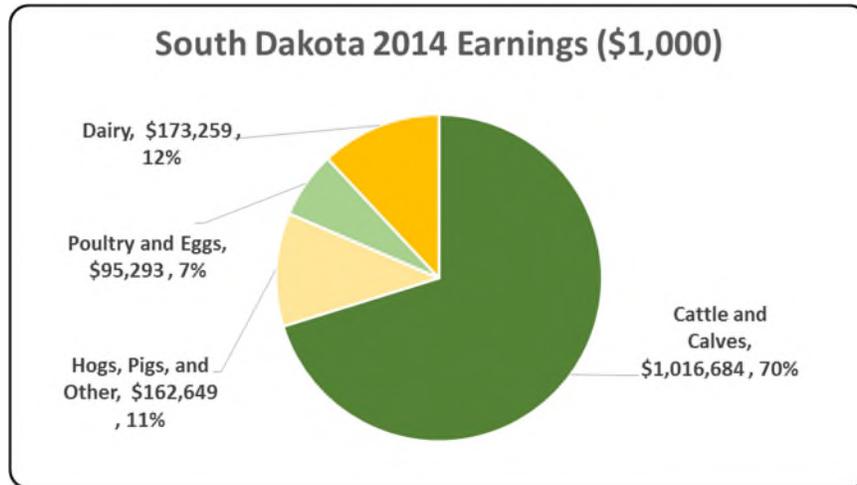
South Dakota Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to South Dakota in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to South Dakota total jobs, contributing 36,307 jobs within and outside of animal agriculture.



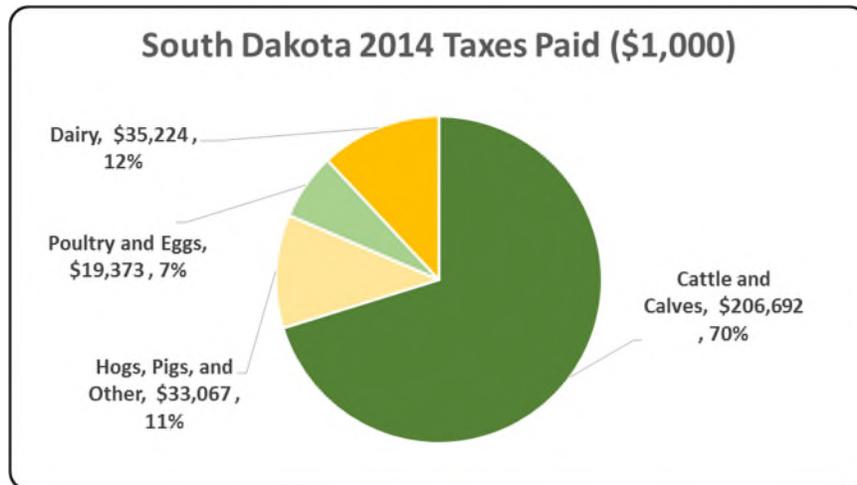
South Dakota Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the South Dakota economy in terms of earnings. South Dakota’s animal agriculture contributed about \$1.4 billion to household earnings in 2014.



South Dakota Taxes Paid by Animal Agriculture

South Dakota’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$294.4 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$197.1 million in property taxes paid by all of South Dakota agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



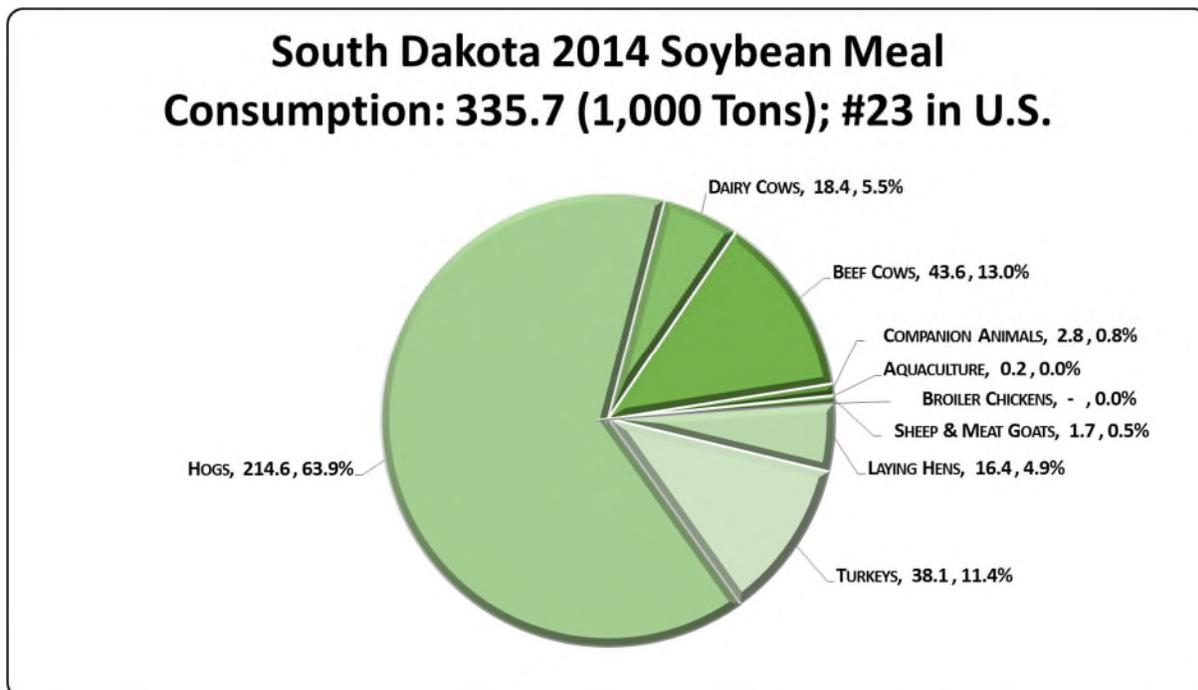
South Dakota Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

South Dakota's animal agriculture consumed almost 335.7 thousand tons of soybean meal in 2014, placing the state as #23 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (214.6 thousand tons)
- Beef Cows (43.6 thousand tons)
- Turkeys (38.1 thousand tons)



South Dakota Animal Unit (AU) Trends

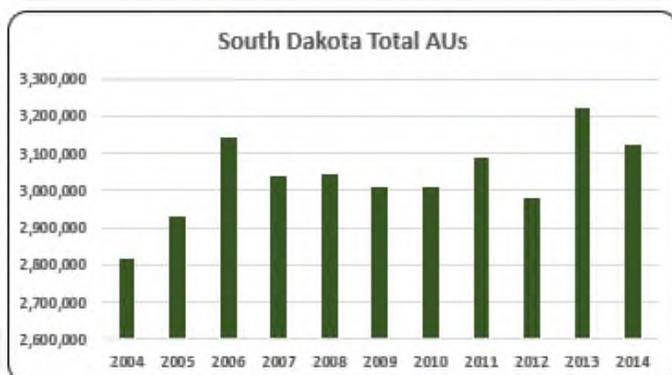
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of South Dakota. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to South Dakota and to give perspective on South Dakota's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

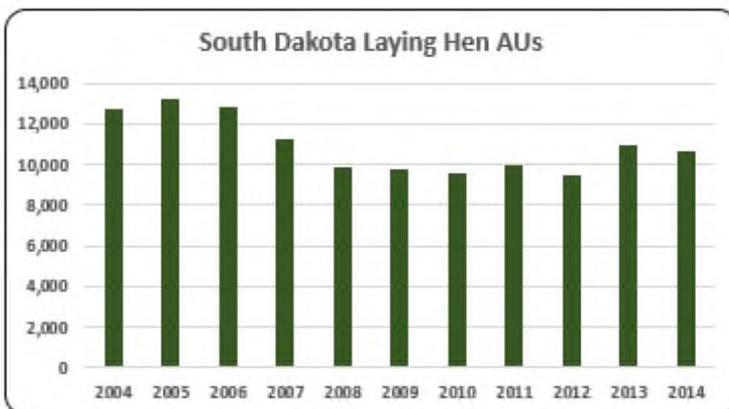
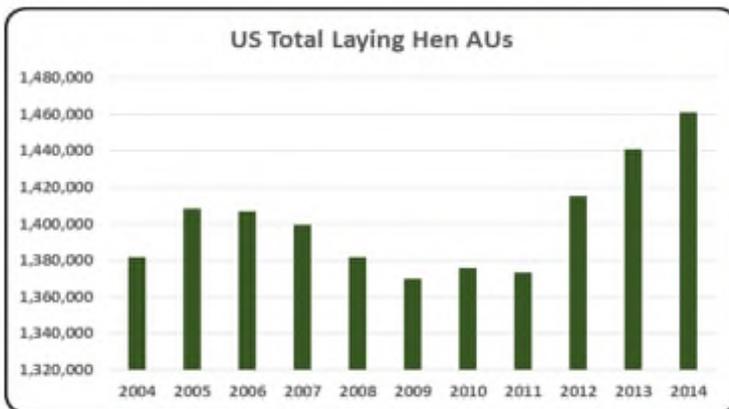
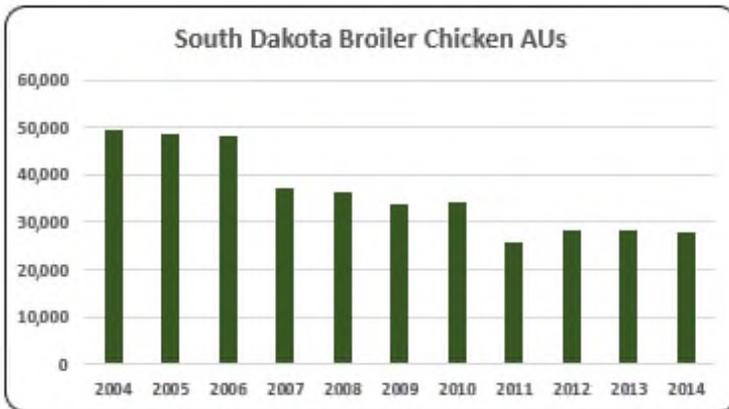
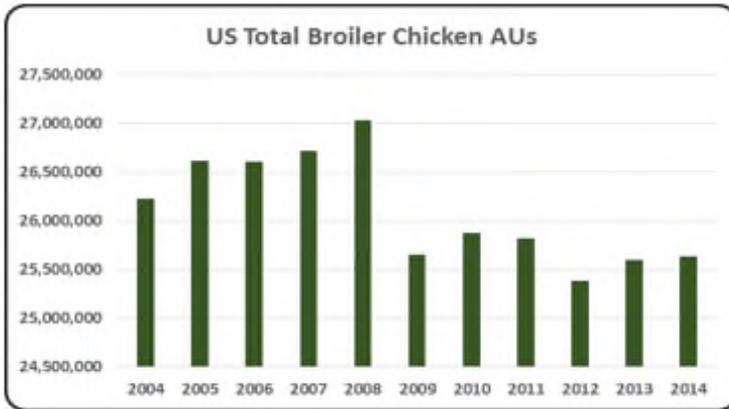
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In South Dakota, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (2,282.0 thousand AUs), Hogs (603.6 thousand AUs), and Dairy Cows (133.0 thousand AUs). Total animal units in South Dakota during 2014 were 3,124.6 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- There were 3,124.6 thousand AUs in South Dakota in 2014. In 2013 there was a record animal production of 3,222.5 thousand AUs. Overall animal production rose 10.9% from 2004 to 2014.

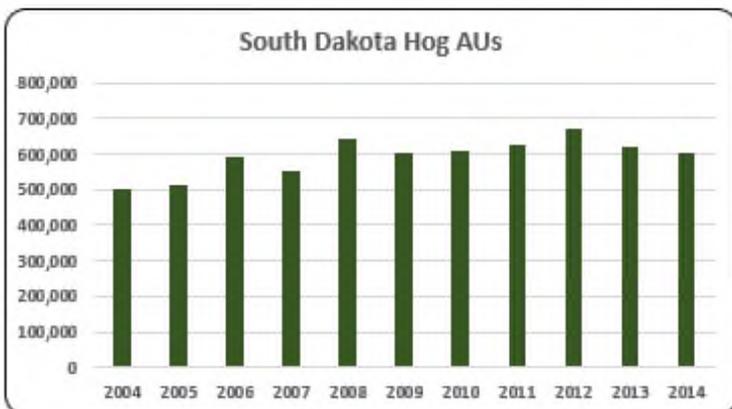
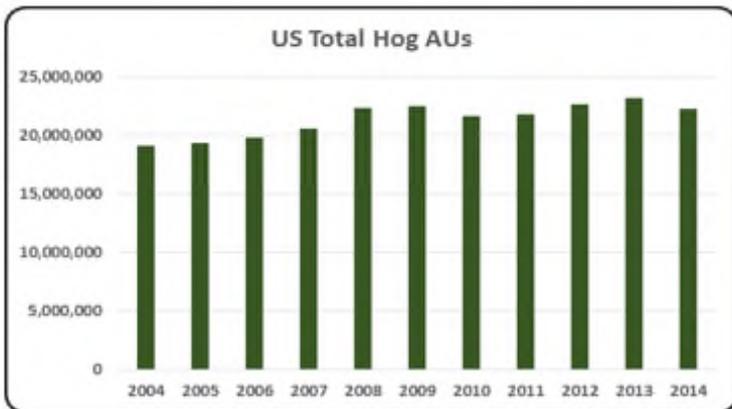
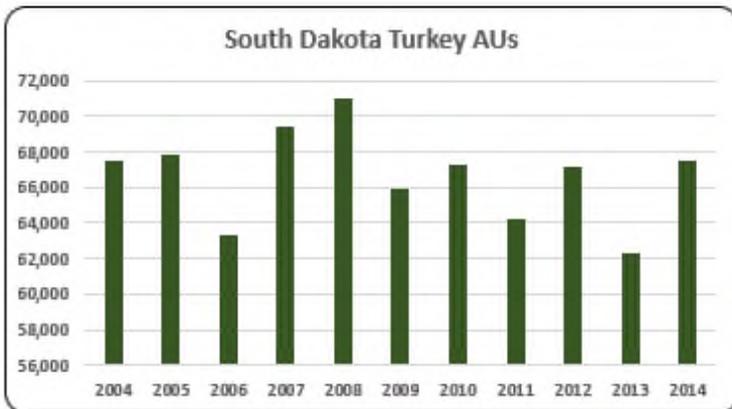
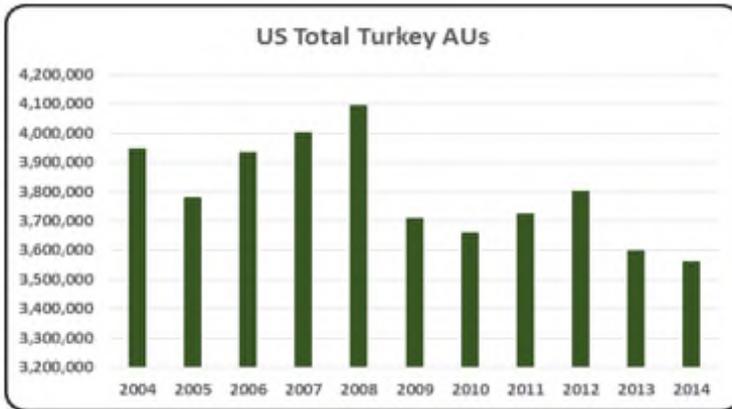


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

- There were 49,554 broiler AUs in 2004 in contrast to 28,017 broiler AUs in 2014. Broiler production declined 43.5% between those years.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

- Layer production was the smallest animal production in South Dakota during the last decade. There were 10,602 layer AUs in 2014 declining 3.0% year-over-year. Overall, layer production decreased 17% in 2014 compared to 2004 (12,716 layer AUs).

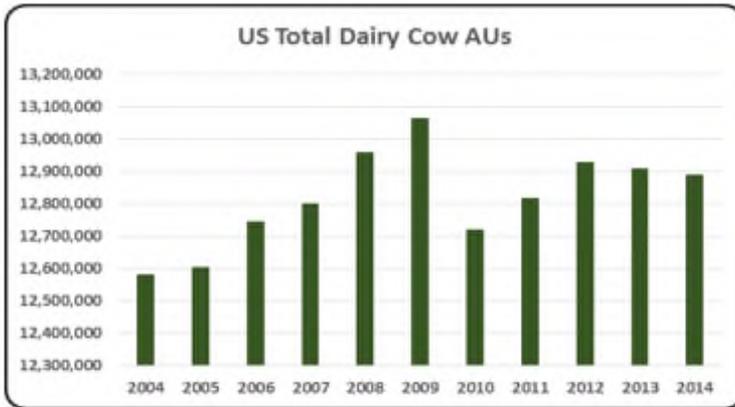


- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

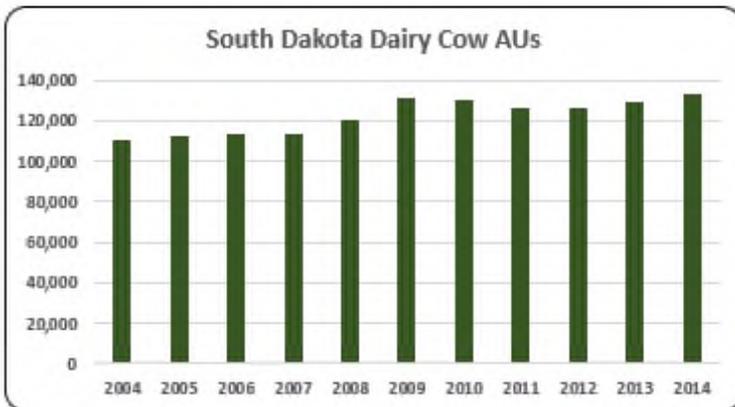
- Turkey production fluctuated throughout the decade from a high in 2008 (70,956 turkey AUs) to a low in 2013 (62,276 turkey AUs).

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

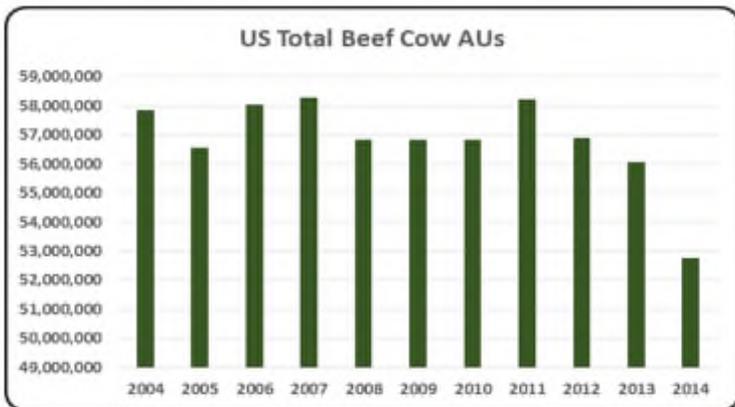
- Hog production in 2014 (603,600 hog AUs) represented 19.32% of animal production in South Dakota. Hog production in 2014 increased 20% relative to the level in 2014 (499,575 hog AUs).



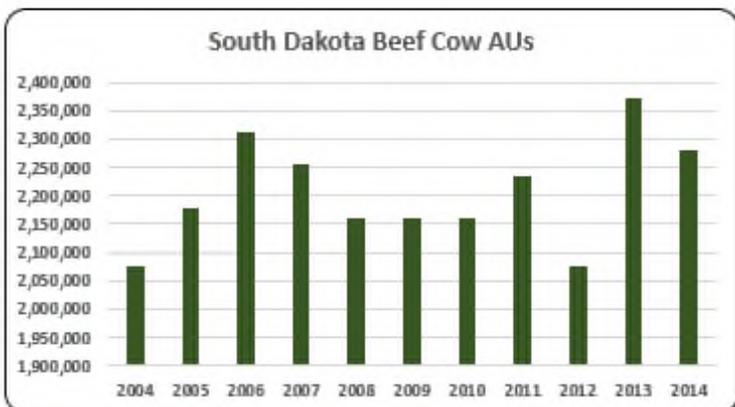
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- There were 133,000 dairy cow AUs in 2014. Production in 2014 increased 3.3% compared to the previous year.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production was the most important animal production in South Dakota accounting for 73.03% (2,282.0 thousand beef cow AUs) of all South Dakota AUs in 2014.

South Dakota Additional Information and Methodology

Animal agriculture is an important part of South Dakota's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in South Dakota, of interest is the degree to which the industry impacts the South Dakota economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for South Dakota animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted South Dakota's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in South Dakota which have occurred. As shown in this state report, South Dakota has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in South Dakota. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

South Dakota Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on South Dakota's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in South Dakota, \$1.795 to \$2.589 million in total economic activity, \$0.291 to \$0.401 in household wages and 7 to 10 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.5444 | \$ 0.4005 | 10.0 |
| | Hogs, Pigs, and Other | \$ 1.7946 | \$ 0.2909 | 7.3 |
| | Poultry and Eggs | \$ 2.5893 | \$ 0.4006 | 9.6 |
| | Dairy | \$ 1.9886 | \$ 0.3326 | 8.5 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 2,076,900 | 2,176,500 | 2,313,600 | 2,256,450 | 2,160,900 | 2,160,900 | 2,160,900 | 2,234,850 | 2,076,300 | 2,373,600 | 2,281,950 |
| | Hog and Pig AUs | 499,575 | 512,625 | 592,575 | 551,700 | 644,250 | 604,500 | 605,850 | 627,000 | 671,700 | 618,750 | 603,600 |
| | Broiler AUs | 49,554 | 48,511 | 48,184 | 37,023 | 36,445 | 33,886 | 34,341 | 25,877 | 28,276 | 28,177 | 28,017 |
| | Turkey AUs | 67,500 | 67,856 | 63,347 | 69,456 | 70,956 | 65,939 | 67,292 | 64,270 | 67,196 | 62,276 | 67,478 |
| | Egg Layer AUs | 12,716 | 13,200 | 12,784 | 11,236 | 9,820 | 9,744 | 9,544 | 9,936 | 9,419 | 10,934 | 10,602 |
| | Dairy AUs | 110,600 | 112,000 | 113,400 | 113,400 | 120,400 | 131,600 | 130,200 | 126,000 | 126,000 | 128,800 | 133,000 |
| | Total Animal Units | 2,816,845 | 2,930,693 | 3,143,890 | 3,039,265 | 3,042,772 | 3,006,569 | 3,008,127 | 3,087,932 | 2,978,891 | 3,222,537 | 3,124,647 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 1,436,904 | \$ 1,518,470 | \$ 1,488,334 | \$ 1,409,731 | \$ 1,400,531 | \$ 1,317,554 | \$ 1,569,641 | \$ 1,749,748 | \$ 1,952,711 | \$ 1,938,119 | \$ 2,538,536 |
| | Hogs and Pigs (\$1,000) | \$ 315,197 | \$ 331,308 | \$ 347,125 | \$ 320,577 | \$ 348,707 | \$ 292,574 | \$ 417,399 | \$ 529,653 | \$ 532,239 | \$ 503,056 | \$ 537,480 |
| | Broilers (\$1,000) | \$ 41,679 | \$ 39,480 | \$ 30,510 | \$ 27,852 | \$ 28,664 | \$ 24,829 | \$ 26,133 | \$ 23,025 | \$ 28,168 | \$ 34,315 | \$ 35,998 |
| | Turkeys (\$1,000) | \$ 57,285 | \$ 50,949 | \$ 61,425 | \$ 74,175 | \$ 89,023 | \$ 82,170 | \$ 114,540 | \$ 126,634 | \$ 139,297 | \$ 117,240 | \$ 138,584 |
| | Eggs (\$1,000) | \$ 40,178 | \$ 20,460 | \$ 26,312 | \$ 51,420 | \$ 55,752 | \$ 37,936 | \$ 37,696 | \$ 44,110 | \$ 44,576 | \$ 57,804 | \$ 63,293 |
| | Milk (\$1,000) | \$ 222,255 | \$ 219,861 | \$ 197,155 | \$ 313,431 | \$ 343,036 | \$ 261,096 | \$ 310,860 | \$ 387,711 | \$ 393,600 | \$ 424,830 | \$ 520,923 |
| | Other | \$ 26,069 | \$ 29,128 | \$ 23,384 | \$ 24,973 | \$ 22,382 | \$ 21,161 | \$ 27,345 | \$ 23,047 | \$ 22,579 | \$ 22,111 | \$ 21,643 |
| | Sheep and Lambs (\$1,000) | \$ 25,679 | \$ 28,644 | \$ 22,806 | \$ 24,302 | \$ 21,617 | \$ 20,302 | \$ 26,393 | \$ 22,002 | \$ 21,440 | \$ 20,878 | \$ 20,316 |
| | Aquaculture (\$1,000) | \$ 390 | \$ 484 | \$ 578 | \$ 671 | \$ 765 | \$ 859 | \$ 952 | \$ 1,046 | \$ 1,139 | \$ 1,233 | \$ 1,327 |
| | Total (\$1,000) | \$ 2,139,568 | \$ 2,209,656 | \$ 2,174,244 | \$ 2,222,159 | \$ 2,288,095 | \$ 2,037,319 | \$ 2,503,615 | \$ 2,883,928 | \$ 3,113,170 | \$ 3,097,475 | \$ 3,856,457 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 |
|--------------------------|--|-----------------|-----------|-----------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 10,957 | 10,702 | 9,031 | 8,288 |
| | Cattle feedlots (112112) | 977 | 1,463 | 794 | 646 |
| | Dairy cattle and milk production (11212) | 932 | 662 | 348 | 276 |
| | Hog and pig farming (1122) | 868 | 493 | 313 | 223 |
| | Poultry and egg production (1123) | 89 | 125 | 274 | 186 |
| | Sheep and goat farming (1124) | 751 | 710 | 706 | 690 |
| | Animal aquaculture and other animal production (1125,1129) | 1,135 | 2,076 | 2,094 | 2,809 |
| Value of Sales (\$1,000) | Cattle and Calves | 1,333,193 | 1,693,838 | 2,307,618 | 2,968,996 |
| | Hogs and Pigs | 282,598 | withheld | 381,360 | 446,756 |
| | Poultry and Eggs | 73,683 | 70,820 | 140,798 | 182,076 |
| | Milk and Other Dairy Products | 167,213 | 156,498 | 279,765 | 374,490 |
| | Aquaculture | 996 | withheld | 3,108 | 2,498 |
| | Other (calculated) | 62,009 | 337,559 | 74,304 | 98,859 |
| | Total | 1,919,692 | 2,258,715 | 3,186,953 | 4,073,675 |
| Input Purchases | Livestock and poultry purchased | (Farms) 12,882 | 11,307 | 10,196 | 11,987 |
| | | \$1,000 452,194 | 580,920 | 881,582 | 978,174 |
| | Breeding livestock purchased | (Farms) n/a | 8,111 | 7,637 | 8,959 |
| | | \$1,000 n/a | 64,732 | 160,850 | 205,411 |
| | Other livestock and poultry purchased | (Farms) n/a | 5,317 | 4,644 | 5,537 |
| | | \$1,000 n/a | 516,188 | 720,732 | 772,763 |
| | Feed purchased | (Farms) 19,837 | 19,389 | 15,462 | 18,795 |
| | \$1,000 369,705 | 433,345 | 617,725 | 1,282,133 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 6,459,051 | \$ 1,016,684 | 25,503 | \$ 206,692 |
| | Hogs, Pigs, and Other | \$ 1,003,402 | \$ 162,649 | 4,078 | \$ 33,067 |
| | Poultry and Eggs | \$ 615,929 | \$ 95,293 | 2,292 | \$ 19,373 |
| | Dairy | \$ 1,035,907 | \$ 173,259 | 4,434 | \$ 35,224 |
| | Total | \$ 9,114,290 | \$ 1,447,884 | 36,307 | \$ 294,355 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 1,877,152 | \$ 295,472 | 7,412 | \$ 60,069 |
| | Hogs, Pigs, and Other | \$ 235,875 | \$ 38,235 | 959 | \$ 7,773 |
| | Poultry and Eggs | \$ 164,412 | \$ 25,437 | 612 | \$ 5,171 |
| | Dairy | \$ 482,008 | \$ 80,617 | 2,063 | \$ 16,390 |
| | Total | \$ 2,759,447 | \$ 439,761 | 11,045 | \$ 89,403 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.5444 | \$ 0.4005 | 10.0 | |
| | Hogs, Pigs, and Other | \$ 1.7946 | \$ 0.2909 | 7.3 | |
| | Poultry and Eggs | \$ 2.5893 | \$ 0.4006 | 9.6 | |
| | Dairy | \$ 1.9886 | \$ 0.3326 | 8.5 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 0.0% | |
| | Total | | | 20.3% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: TENNESSEE

Tennessee Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Tennessee's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Tennessee. The success of Tennessee animal agriculture in turn has an impact on the rest of the state and regional economies. For example, in the state of Tennessee during 2014 animal agriculture contributed:

- \$3.7 billion in economic output
- 17,950 jobs
- \$638.0 million in earnings
- \$168. million in income taxes paid at local, state, and federal levels
- \$99.2 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Tennessee increased economic output by over \$432.1 million, boosted household earnings by \$72.0 million, contributed 2,026 additional jobs and paid \$19.0 million in additional tax revenues.

Tennessee's animal agriculture consumed about 291.7 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (213.1 thousand tons)
- Hogs (22.4 thousand tons)
- Egg-Laying Hens (13.4 thousand tons)

This report examines animal agriculture in Tennessee over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Tennessee, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a contributor to the economic well-being of the people of Tennessee and beyond.

Tennessee Economic Impact of Animal Agriculture

Animal agriculture is an important part of Tennessee's economy. In 2014, Tennessee's animal agriculture contributed the following to the economy:

- About \$3.7 billion in economic output
- \$638.0 million in household earnings
- 17,950 jobs
- \$168. million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade Tennessee's animal agriculture has:

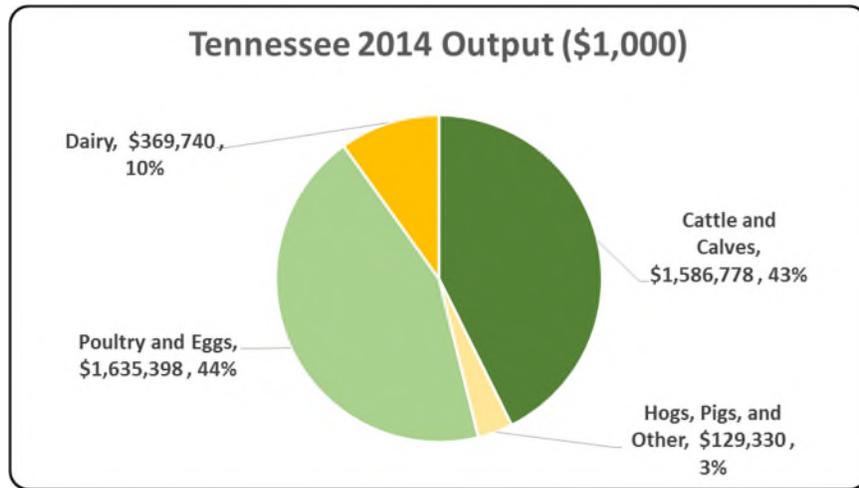
- Increased economic output by \$432.1 million
- Boosted household earnings by \$72.0 million
- Added 2,026 jobs
- Paid an additional \$19.0 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 3,721,246 | \$ 432,123 | 13.14% |
| Earnings (\$1,000) | \$ 638,001 | \$ 72,031 | 12.73% |
| Employment (Jobs) | 17,950 | 2,026 | 12.72% |
| Income Taxes Paid (\$1,000) | \$ 167,986 | \$ 18,966 | 12.73% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 99,159 | | |

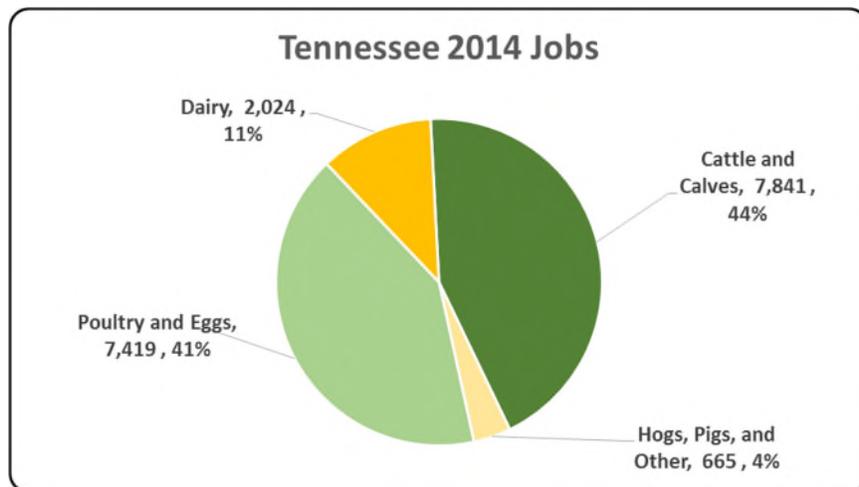
Tennessee Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Tennessee economy. Animal agriculture’s impact on Tennessee total economic output is about \$3.7 billion.



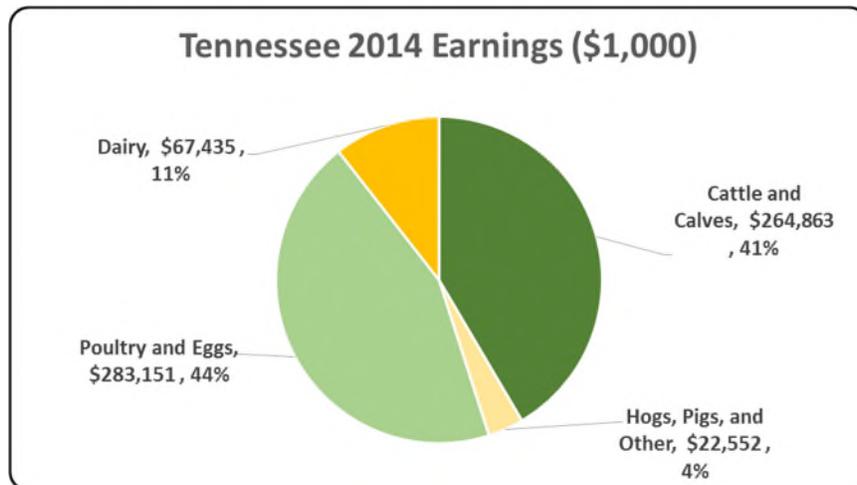
Tennessee Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Tennessee in terms of animal agriculture jobs. As shown, animal agriculture contributes about 17,950 jobs within and outside of animal agriculture.



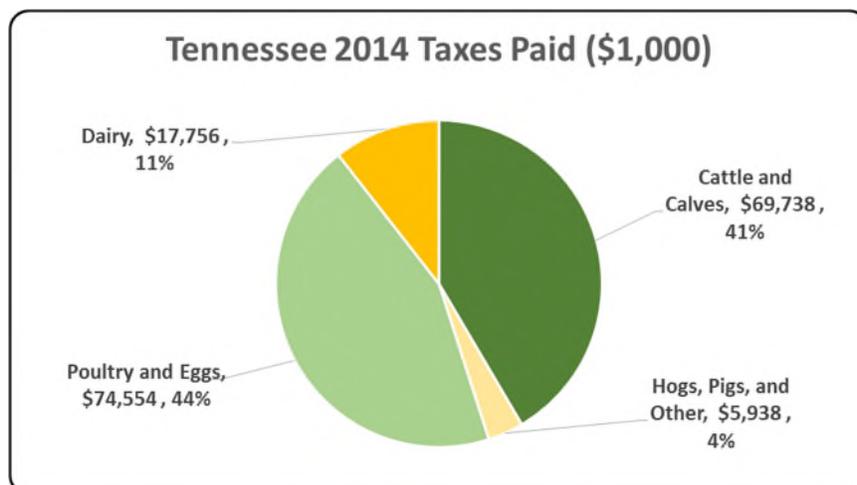
Tennessee Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Tennessee economy in terms of earnings. Tennessee’s animal agriculture contributed about \$638.0 million to household earnings in 2014.



Tennessee Taxes Paid by Animal Agriculture

Tennessee’s animal agriculture is also a source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$168 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$99.2 million in property taxes paid by all of Tennessee agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



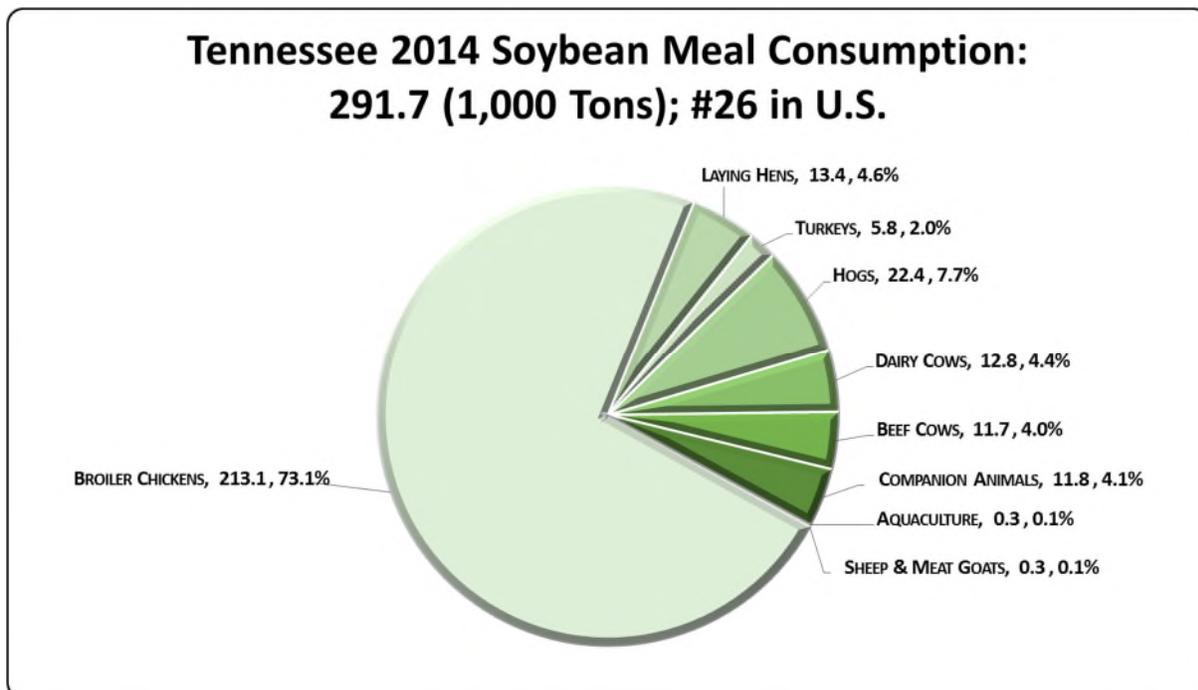
Tennessee Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Tennessee's animal agriculture consumed almost 291.7 thousand tons of soybean meal in 2014, placing the state as #26 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (213.1 thousand tons)
- Hogs (22.4 thousand tons)
- Egg-Laying Hens (13.4 thousand tons)

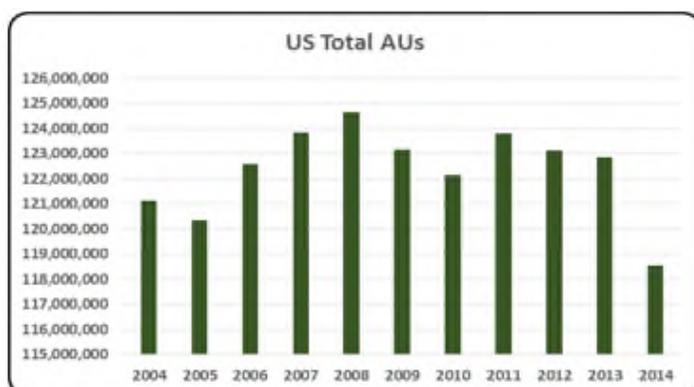


Tennessee Animal Unit (AU) Trends

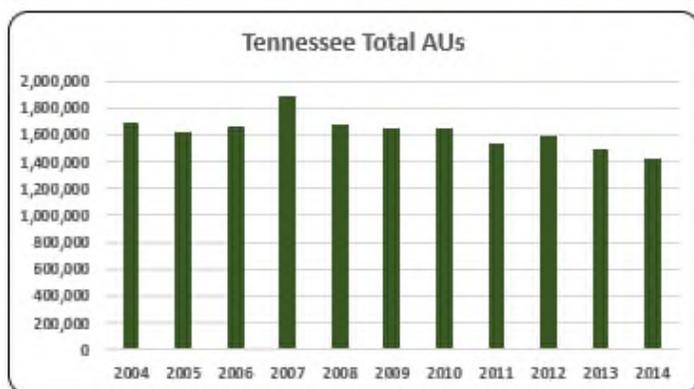
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Tennessee. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Tennessee and to give perspective on Tennessee's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

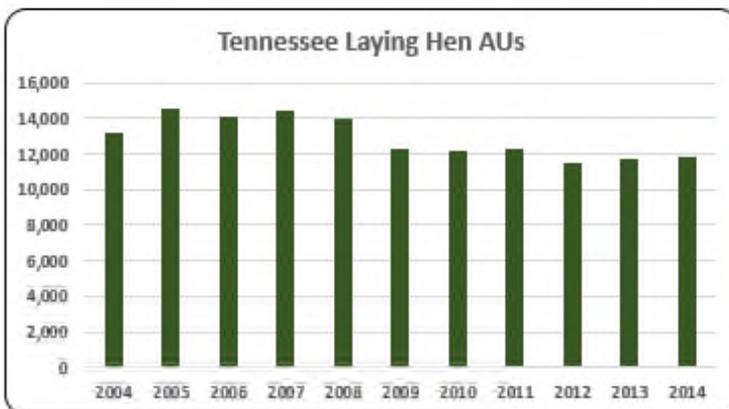
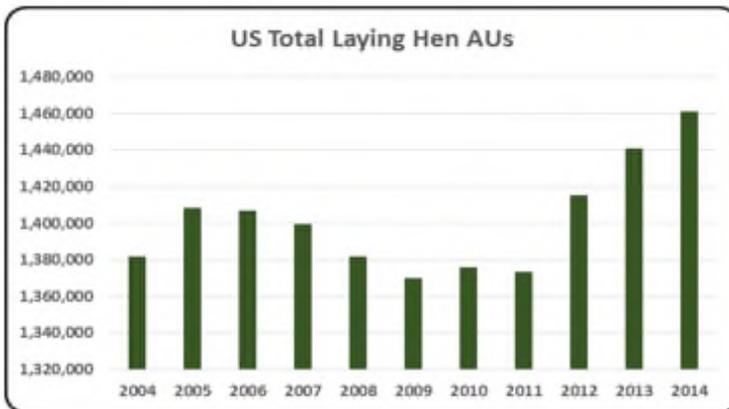
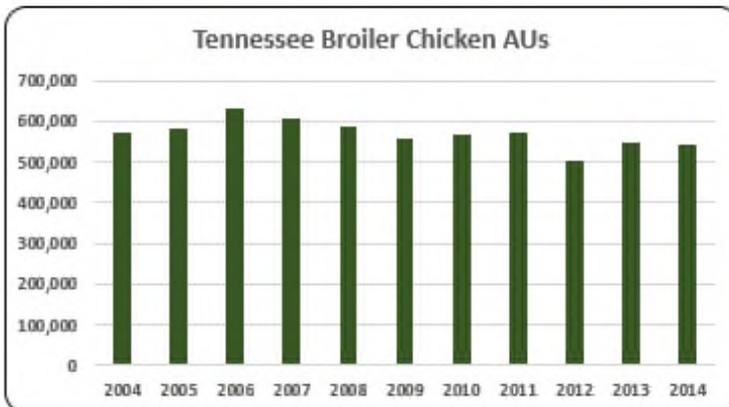
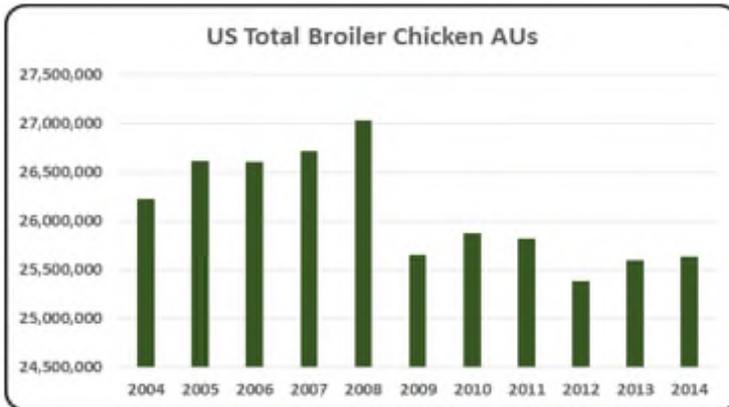
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Tennessee, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (741.8 thousand AUs), Broilers (542.8 thousand AUs), and Dairy Cows (64.4 thousand AUs). Total animal units in Tennessee during 2014 were 1,428.6 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- Tennessee animal production reached a level of 1,428.6 thousand AUs in 2014. Tennessee AUs represent 1.21% of the U.S. total AUs. Animal production declined 15.8% from 2004 to 2014.

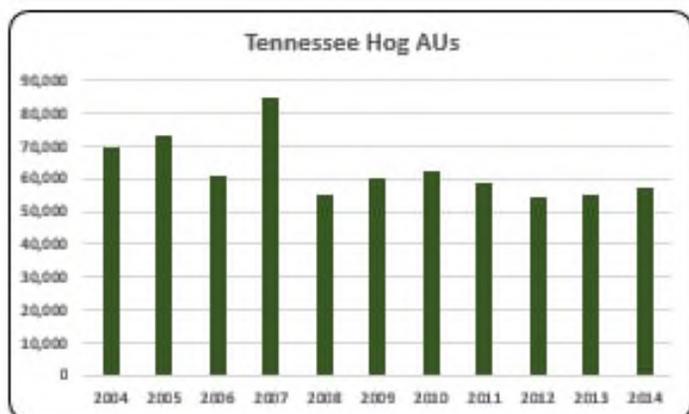
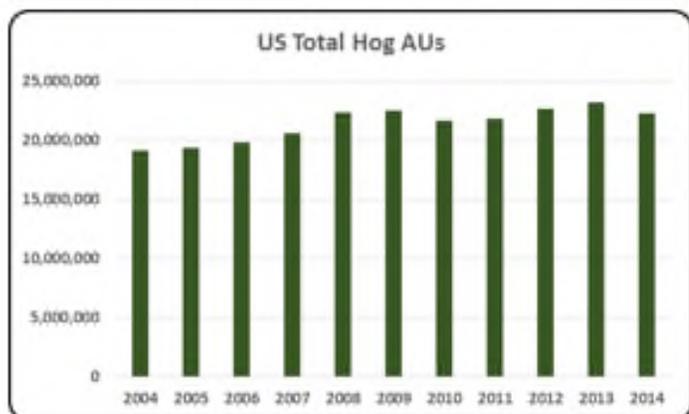
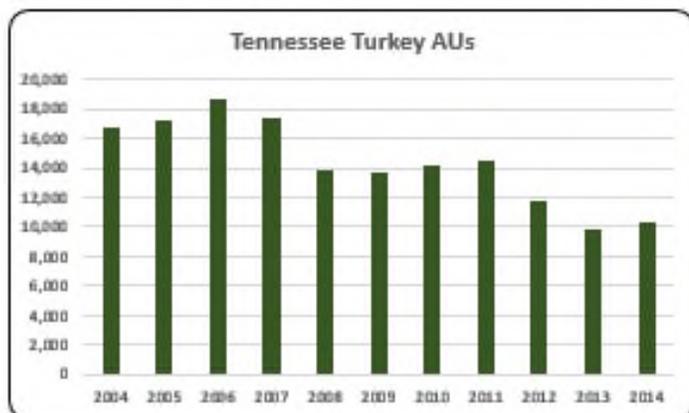
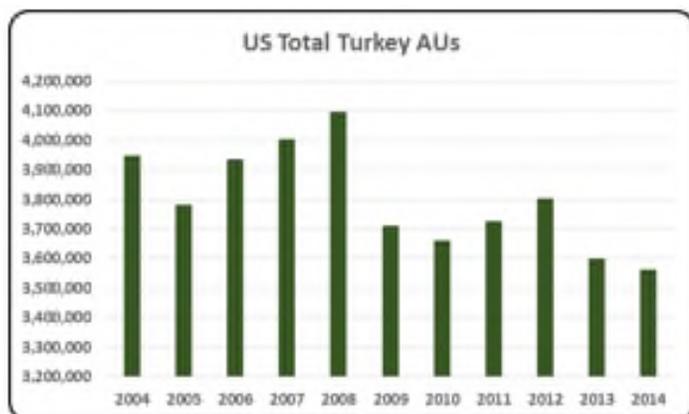


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

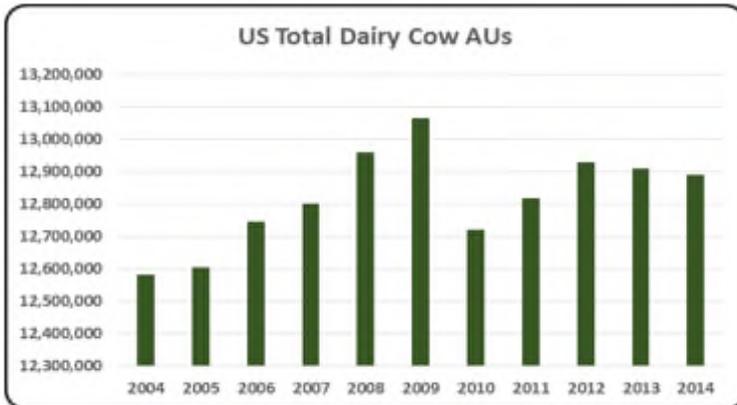
- There were 570,001 broiler AUs, on average, during the last decade. Broiler production decreased 5.4% from 2004 to 2014.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

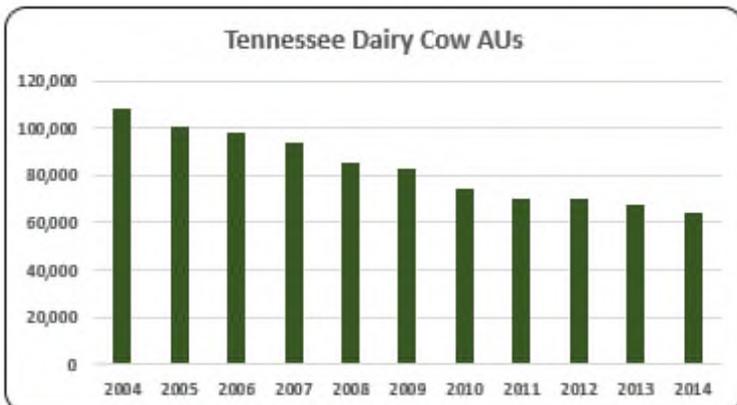
- There was a 10.4% drop in layer production from 2004 (13,239) to 2014 (11,859). The number of layer AUs in 2014 rose 1.6% relative to 2013.



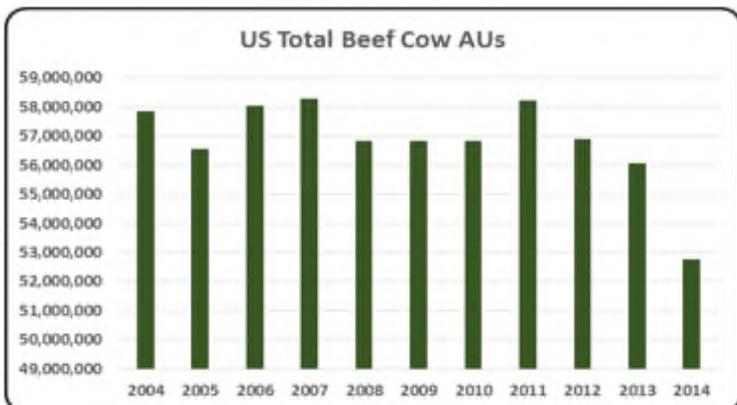
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- Turkey production shrank 38.7% from 2004 (16,806 turkey AUs) to 2014 (10,294 turkey AUs).
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- The average number of hog AUs was 62,809 during the last decade. The number of hog AUs in 2014 (57,450) was 17.1% below the number of hog AUs in 2004 (69,300).



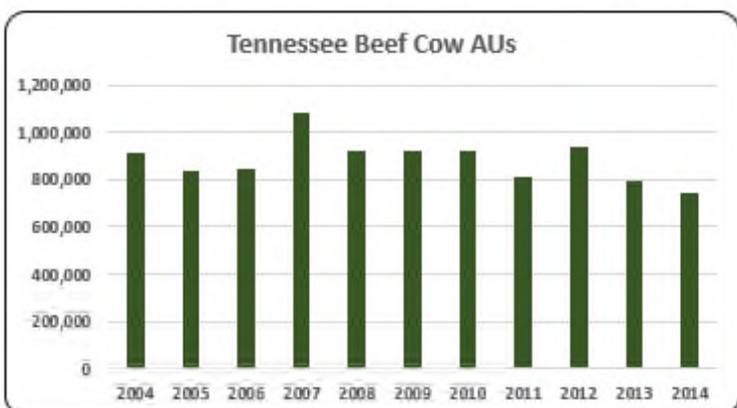
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production consistently declined from 2004 (107,800) to 2014 (64,400). The decline represented a 40.3% drop in the level of dairy cow AUs.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production was the number one animal production in Tennessee with 51.92% of all AUs in the state in 2014. The 2014 beef cow production was 741,750 beef cow AUs, dropping 19.0% compared to 2004 (915,900 beef cow AUs).

Tennessee Additional Information and Methodology

Animal agriculture is an important part of Tennessee's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Tennessee, of interest is the degree to which the industry impacts the Tennessee economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Tennessee animal agriculture are presented in this report.

Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Tennessee's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Tennessee which have occurred. As shown in this state report, Tennessee has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Tennessee. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Tennessee Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Tennessee's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Tennessee, \$1.684 to \$2.387 million in total economic activity, \$0.294 to \$0.413 in household wages and 9 to 11 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.0507 | \$ 0.3423 | 10.1 |
| | Hogs, Pigs, and Other | \$ 1.6837 | \$ 0.2936 | 8.7 |
| | Poultry and Eggs | \$ 2.3871 | \$ 0.4133 | 10.8 |
| | Dairy | \$ 1.9108 | \$ 0.3485 | 10.5 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 915,900 | 837,450 | 847,650 | 1,078,950 | 922,350 | 922,350 | 922,350 | 807,450 | 934,050 | 796,050 | 741,750 |
| | Hog and Pig AUs | 69,300 | 73,050 | 60,750 | 84,900 | 54,750 | 60,300 | 62,250 | 58,500 | 54,300 | 55,350 | 57,450 |
| | Broiler AUs | 573,527 | 579,577 | 628,914 | 605,565 | 588,834 | 558,175 | 568,256 | 571,761 | 504,070 | 548,531 | 542,799 |
| | Turkey AUs | 16,806 | 17,236 | 18,729 | 17,390 | 13,900 | 13,616 | 14,182 | 14,435 | 11,815 | 9,856 | 10,294 |
| | Egg Layer AUs | 13,239 | 14,580 | 14,069 | 14,411 | 14,000 | 12,245 | 12,164 | 12,235 | 11,496 | 11,674 | 11,859 |
| | Dairy AUs | 107,800 | 100,800 | 98,000 | 93,800 | 85,400 | 82,600 | 74,200 | 70,000 | 70,000 | 67,200 | 64,400 |
| | Total Animal Units | 1,696,571 | 1,622,693 | 1,668,113 | 1,895,016 | 1,679,234 | 1,649,286 | 1,653,402 | 1,534,382 | 1,585,731 | 1,488,661 | 1,428,553 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 494,640 | \$ 532,514 | \$ 519,164 | \$ 514,160 | \$ 450,099 | \$ 441,237 | \$ 503,087 | \$ 568,034 | \$ 594,656 | \$ 548,543 | \$ 773,774 |
| | Hogs and Pigs (\$1,000) | \$ 38,314 | \$ 46,135 | \$ 38,924 | \$ 50,213 | \$ 42,010 | \$ 36,343 | \$ 52,823 | \$ 60,198 | \$ 54,349 | \$ 59,395 | \$ 70,078 |
| | Broilers (\$1,000) | \$ 439,604 | \$ 431,376 | \$ 392,004 | \$ 451,543 | \$ 468,510 | \$ 442,148 | \$ 475,589 | \$ 454,226 | \$ 436,000 | \$ 576,043 | \$ 598,207 |
| | Turkeys (\$1,000) | \$ 15,593 | \$ 16,535 | \$ 19,542 | \$ 20,055 | \$ 18,774 | \$ 12,591 | \$ 16,868 | \$ 18,919 | \$ 17,136 | \$ 11,285 | \$ 18,894 |
| | Eggs (\$1,000) | \$ 35,511 | \$ 34,478 | \$ 33,642 | \$ 46,602 | \$ 42,815 | \$ 38,665 | \$ 43,922 | \$ 59,717 | \$ 55,816 | \$ 61,387 | \$ 67,997 |
| | Milk (\$1,000) | \$ 194,040 | \$ 176,320 | \$ 148,958 | \$ 202,797 | \$ 191,496 | \$ 128,169 | \$ 152,150 | \$ 175,770 | \$ 157,780 | \$ 164,475 | \$ 193,500 |
| | Other | \$ 2,078 | \$ 2,513 | \$ 2,817 | \$ 3,315 | \$ 3,835 | \$ 4,110 | \$ 5,123 | \$ 5,305 | \$ 5,782 | \$ 6,259 | \$ 6,735 |
| | Sheep and Lambs (\$1,000) | \$ 1,063 | \$ 1,227 | \$ 1,260 | \$ 1,487 | \$ 1,737 | \$ 1,741 | \$ 2,483 | \$ 2,395 | \$ 2,601 | \$ 2,807 | \$ 3,012 |
| | Aquaculture (\$1,000) | \$ 1,015 | \$ 1,286 | \$ 1,557 | \$ 1,828 | \$ 2,098 | \$ 2,369 | \$ 2,640 | \$ 2,911 | \$ 3,181 | \$ 3,452 | \$ 3,723 |
| | Total (\$1,000) | \$ 1,219,780 | \$ 1,239,871 | \$ 1,155,051 | \$ 1,288,685 | \$ 1,217,539 | \$ 1,103,263 | \$ 1,249,562 | \$ 1,342,169 | \$ 1,321,519 | \$ 1,427,386 | \$ 1,729,185 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 |
|--------------------------|--|------------------|------------------|------------------|------------------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 39,017 | 42,602 | 41,886 | 34,457 |
| | Cattle feedlots (112112) | 1,183 | 31 | 37 | 37 |
| | Dairy cattle and milk production (11212) | 1,183 | 947 | 893 | 472 |
| | Hog and pig farming (1122) | 751 | 400 | 504 | 251 |
| | Poultry and egg production (1123) | 875 | 1,320 | 1,694 | 1,480 |
| | Sheep and goat farming (1124) | 560 | 1,633 | 2,023 | 2,139 |
| | Animal aquaculture and other animal production (1125,1129) | 4,993 | 10,731 | 9,010 | 6,769 |
| Value of Sales (\$1,000) | Cattle and Calves | 444,707 | 499,143 | 633,303 | 735,511 |
| | Hogs and Pigs | 76,745 | 42,632 | 33,797 | 48,245 |
| | Poultry and Eggs | 321,790 | 359,286 | 572,866 | 552,015 |
| | Milk and Other Dairy Products | 207,296 | 173,410 | 180,503 | 145,445 |
| | Aquaculture | 3,901 | 4,799 | 4,893 | withheld |
| | Other (calculated) | 34,822 | 47,996 | 44,246 | 8,906 |
| | Total | 1,089,261 | 1,127,266 | 1,469,608 | 1,490,122 |
| Input Purchases | Livestock and poultry purchased | (Farms) 20,054 | 21,962 | 16,930 | 17,664 |
| | | \$1,000 148,848 | 175,145 | 213,700 | 283,304 |
| | Breeding livestock purchased | (Farms) n/a | 12,957 | 10,548 | 10,870 |
| | | \$1,000 n/a | 32,136 | 47,611 | 62,754 |
| | Other livestock and poultry purchased | (Farms) n/a | 11,274 | 8,552 | 9,202 |
| | | \$1,000 n/a | 143,009 | 166,089 | 220,551 |
| Feed purchased | (Farms) 42,712 | 57,492 | 49,442 | 48,003 | |
| | \$1,000 312,849 | 386,790 | 547,993 | 679,459 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,586,778 | \$ 264,863 | 7,841 | \$ 69,738 |
| | Hogs, Pigs, and Other | \$ 129,330 | \$ 22,552 | 665 | \$ 5,938 |
| | Poultry and Eggs | \$ 1,635,398 | \$ 283,151 | 7,419 | \$ 74,554 |
| | Dairy | \$ 369,740 | \$ 67,435 | 2,024 | \$ 17,756 |
| | Total | \$ 3,721,246 | \$ 638,001 | 17,950 | \$ 167,986 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 315,550 | \$ 52,671 | 1,559 | \$ 13,868 |
| | Hogs, Pigs, and Other | \$ 44,100 | \$ 7,690 | 227 | \$ 2,025 |
| | Poultry and Eggs | \$ 167,397 | \$ 28,983 | 759 | \$ 7,631 |
| | Dairy | \$ (94,924) | \$ (17,313) | (520) | \$ (4,558) |
| | Total | \$ 432,123 | \$ 72,031 | 2,026 | \$ 18,966 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.0507 | \$ 0.3423 | 10.1 | |
| | Hogs, Pigs, and Other | \$ 1.6837 | \$ 0.2936 | 8.7 | |
| | Poultry and Eggs | \$ 2.3871 | \$ 0.4133 | 10.8 | |
| | Dairy | \$ 1.9108 | \$ 0.3485 | 10.5 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 6.0% |
| | Total | | | | 26.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: TEXAS

Texas Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Texas's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Texas. The success of Texas animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Texas during 2014 animal agriculture contributed:

- \$43.2 billion in economic output
- 287,445 jobs
- \$7.9 billion in earnings
- \$1.6 billion in income taxes paid at local, state, and federal levels
- \$553.9 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Texas increased economic output by over \$9.4 billion, boosted household earnings by \$1.7 billion, contributed 63,914 additional jobs and paid \$354.6 million in additional tax revenues.

Texas's animal agriculture consumed about 1.3 million tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (842.5 thousand tons)
- Hogs (129.7 thousand tons)
- Beef Cows (119.4 thousand tons)

This report examines animal agriculture in Texas over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Texas, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Texas and beyond.

Texas Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Texas's economy. In 2014, Texas's animal agriculture contributed the following to the economy:

- About \$43.2 billion in economic output
- \$7.9 billion in household earnings
- 287,445 jobs
- \$1.6 billion in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Texas's animal agriculture has:

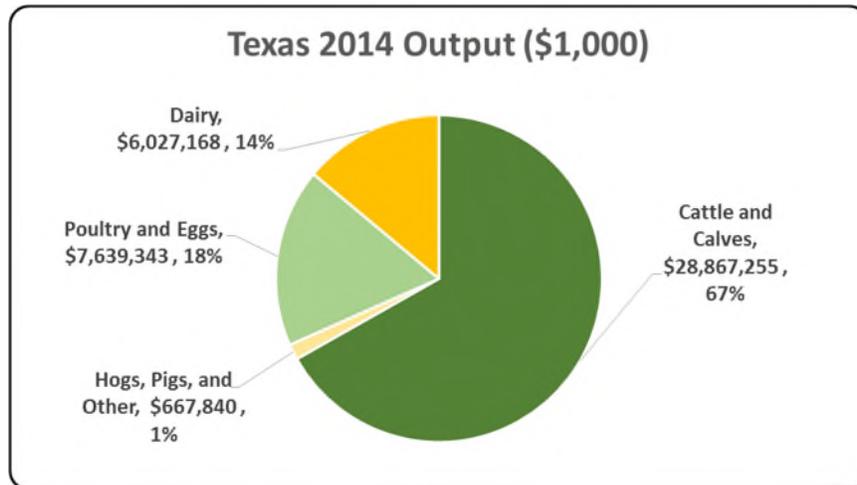
- Increased economic output by \$9.4 billion
- Boosted household earnings by \$1.7 billion
- Added 63,914 jobs
- Paid an additional \$354.6 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 43,201,606 | \$ 9,392,126 | 27.78% |
| Earnings (\$1,000) | \$ 7,922,110 | \$ 1,744,078 | 28.23% |
| Employment (Jobs) | 287,445 | 63,914 | 28.59% |
| Income Taxes Paid (\$1,000) | \$ 1,610,565 | \$ 354,571 | 28.23% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 553,870 | | |

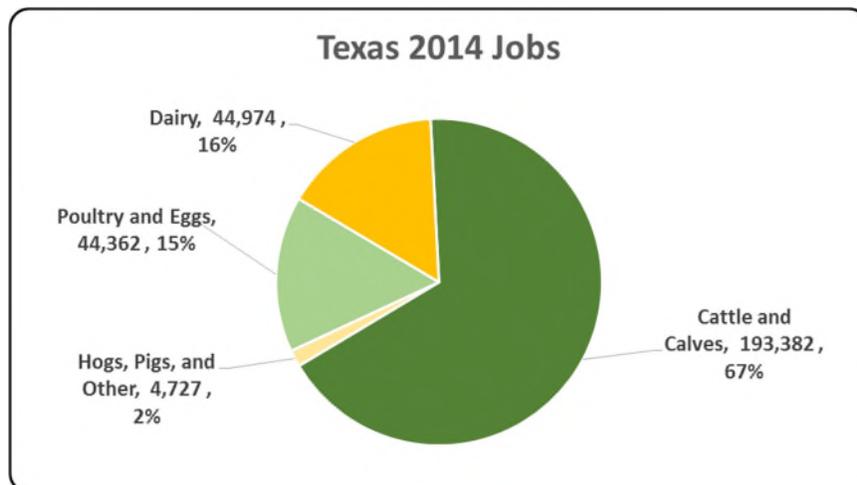
Texas Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Texas economy. Animal agriculture’s impact on Texas total economic output is about \$43.2 billion.



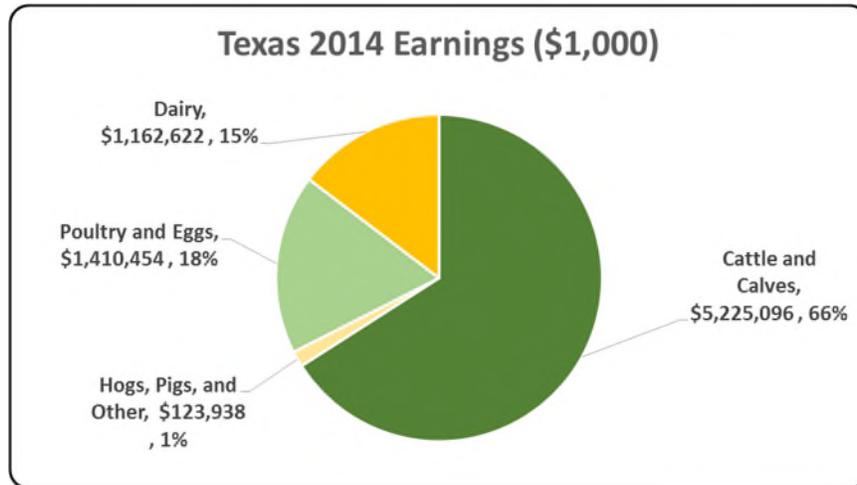
Texas Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Texas in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Texas total jobs, contributing 287,445 jobs within and outside of animal agriculture.



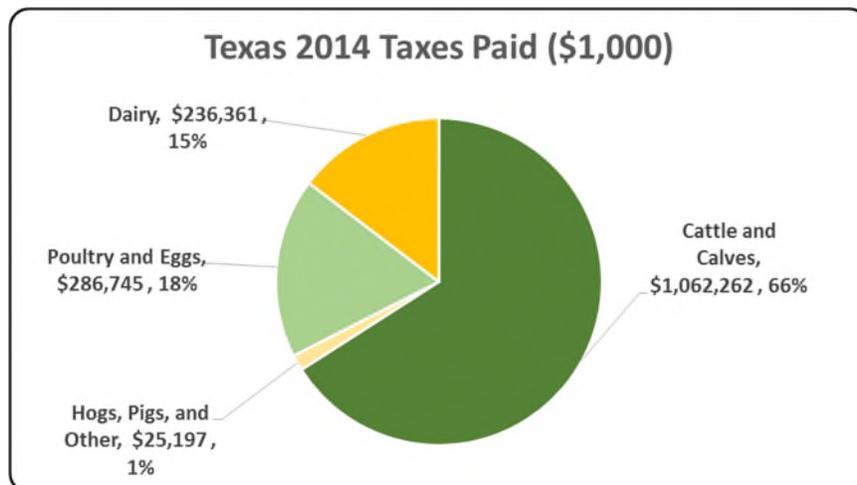
Texas Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Texas economy in terms of earnings. Texas’s animal agriculture contributed about \$7.9 billion to household earnings in 2014.



Texas Taxes Paid by Animal Agriculture

Texas’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$1.6 billion in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$553.9 million in property taxes paid by all of Texas agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



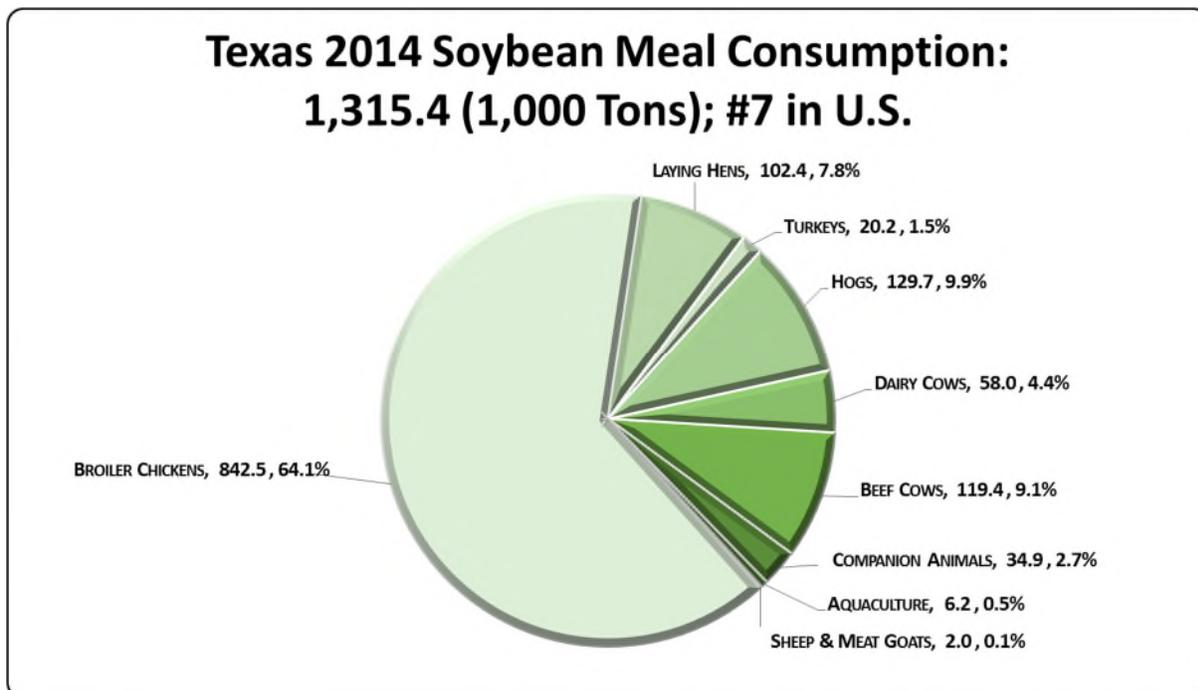
Texas Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Texas's animal agriculture consumed almost 1.3 million tons of soybean meal in 2014, placing the state as #7 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (842.5 thousand tons)
- Hogs (129.7 thousand tons)
- Beef Cows (119.4 thousand tons)

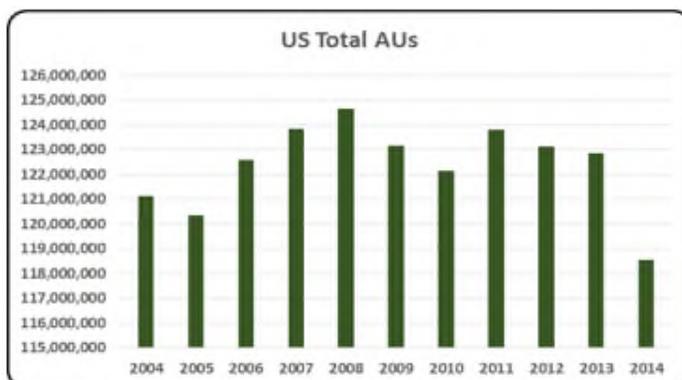


Texas Animal Unit (AU) Trends

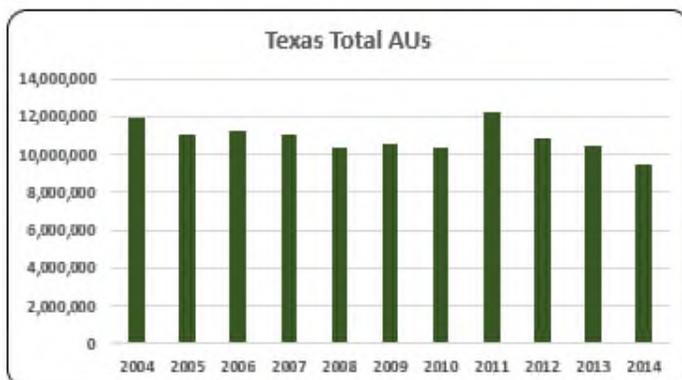
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Texas. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Texas and to give perspective on Texas's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

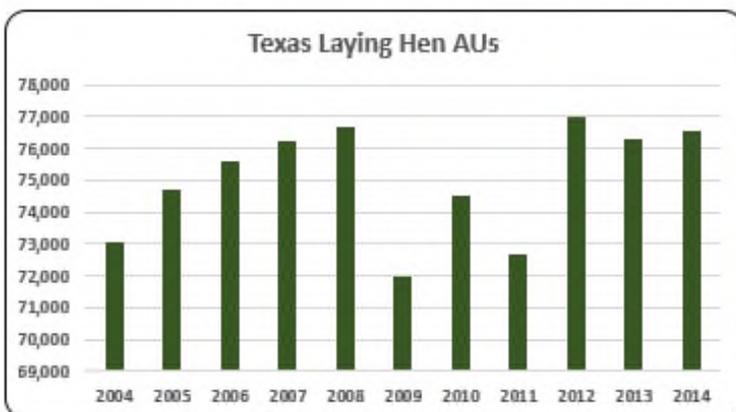
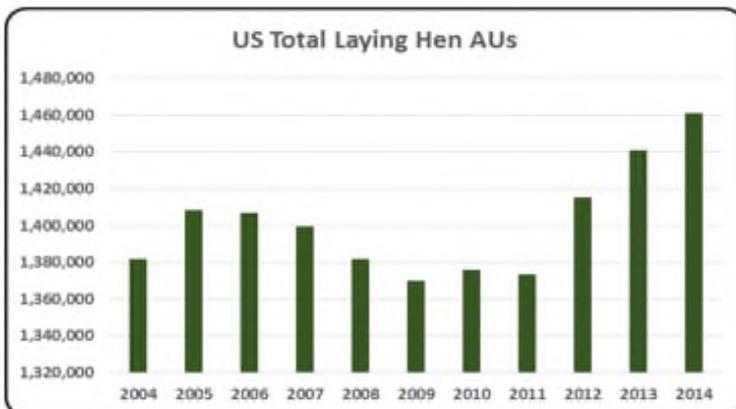
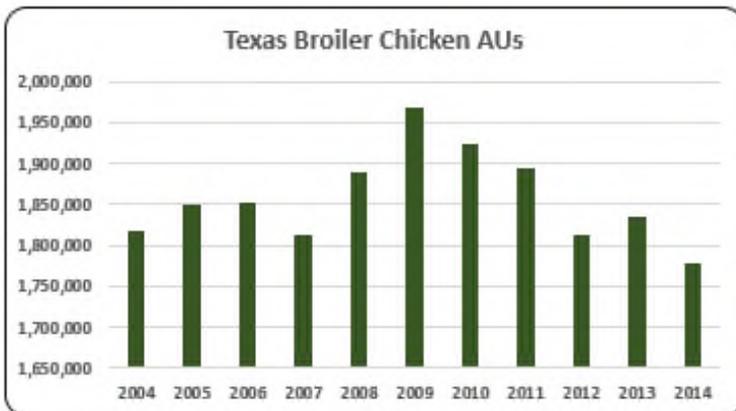
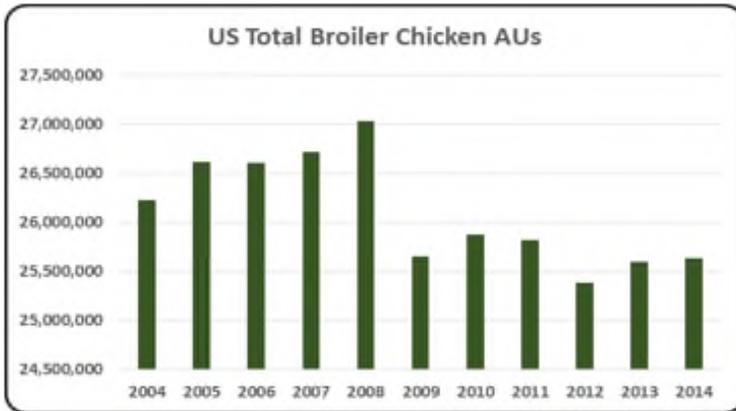
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Texas, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (6,629.4 thousand AUs), Broilers (1,778.7 thousand AUs), and Dairy Cows (616.0 thousand AUs). Total animal units in Texas during 2014 were 9,461.8 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- There were 9,461.8 thousand AUs in Texas in 2014. The number of AUs declined 10.0% in 2014 year-over-year. Eight percent of all AUs in the U.S. were in Texas in 2014.

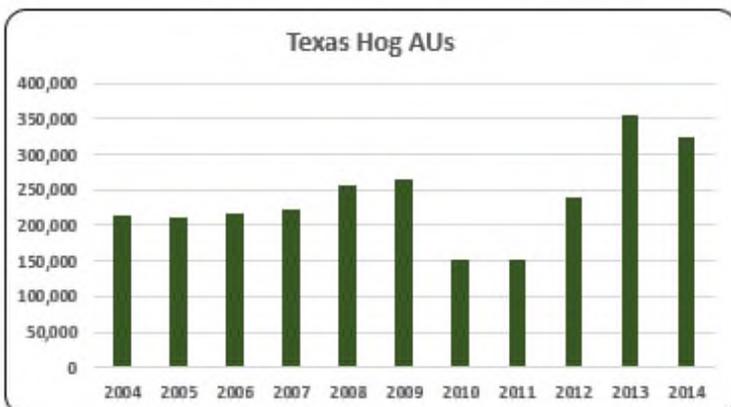
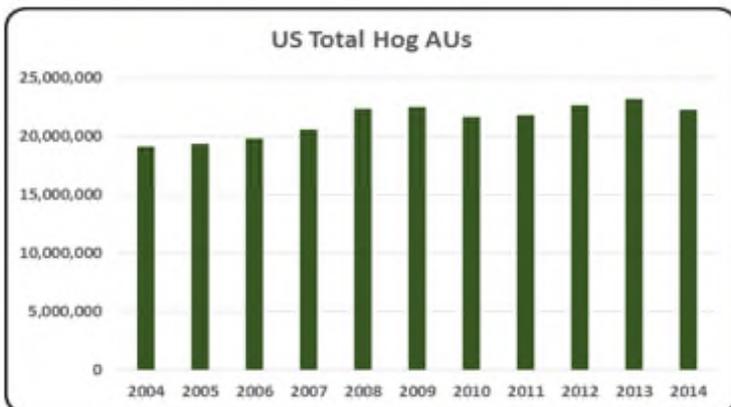
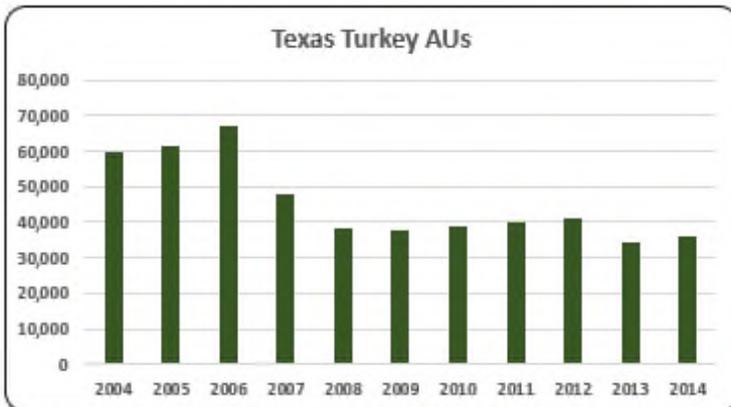
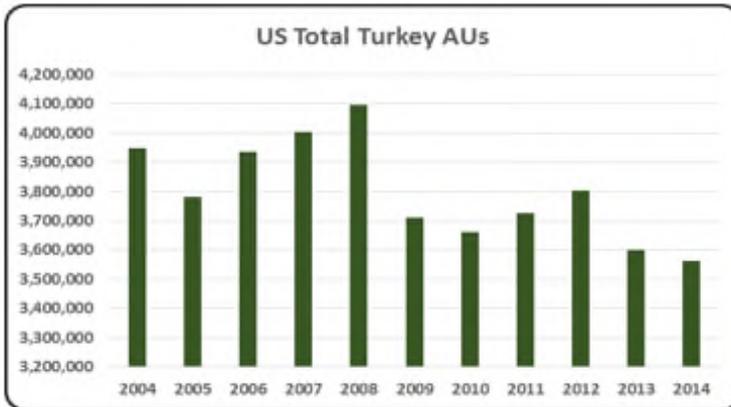


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

- Broiler production in Texas contributed 18.8% (1,778.7 broiler AUs) of all animal production in the state in 2014. There was a record broiler production in 2009 with 1,967.6 thousand broiler AUs. Since 2009 broiler production declined to the lowest level of the decade in 2014.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

- Less than 1% (76,554 layer AUs) of all animal production in 2014 was in layer production. 2014 production was almost 5% above the level of layer AUs in 2004 (73,028).

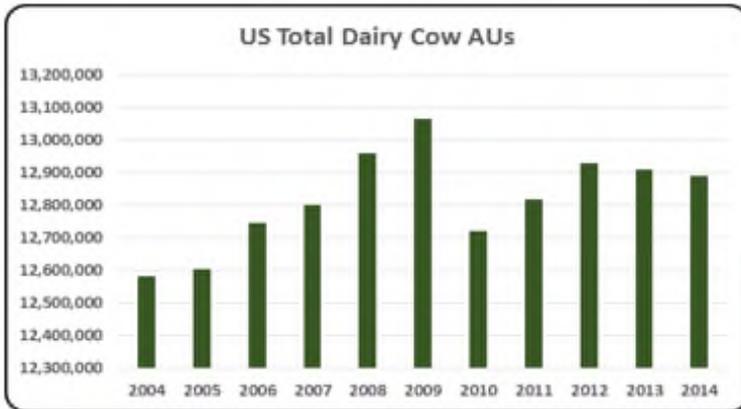


- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

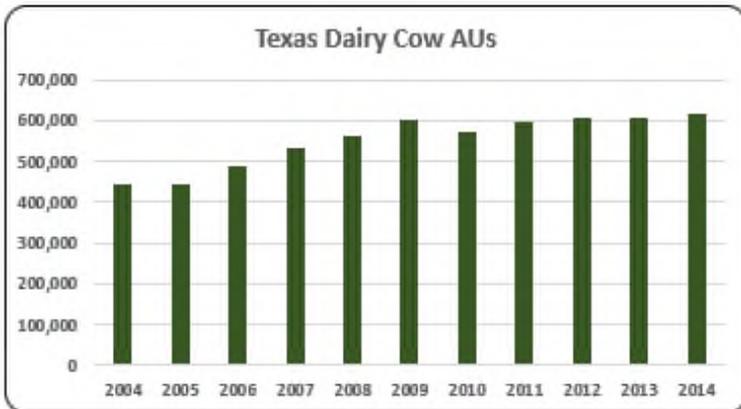
- Turkey production in Texas was the smallest of all animal production in the state, contributing only 0.38% to Texas animal production in 2014.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

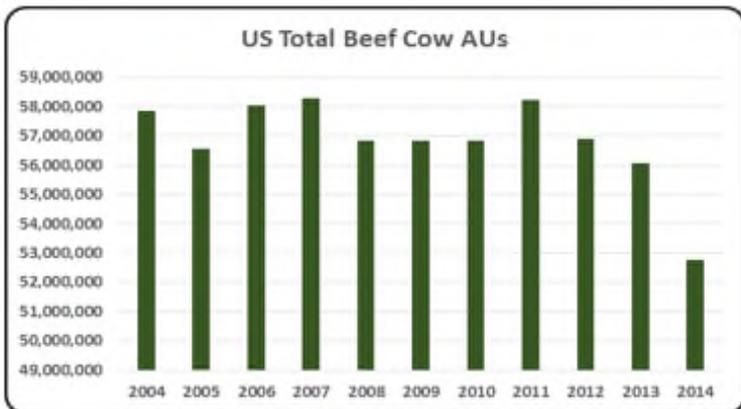
- On average, there were 236,895 hog AUs in Texas from 2004 to 2014. Hog production in 2014 (325,350 hog AUs) was 52.1% higher than production in 2004 (213,945 hog AUs).



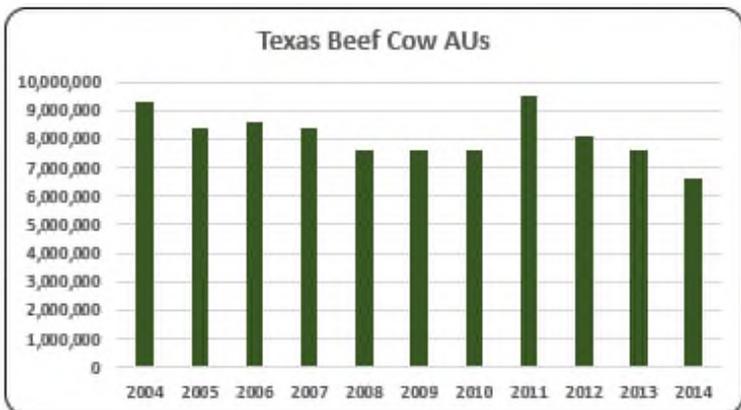
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production in 2014 (616,000 dairy cow AUs) was 38.8% above production in 2004 (443,800 dairy cow AUs).



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Seventy percent (6,629.4 thousand beef cow AUs) of all Texas AU were from beef cows. Beef cow production declined 12.7% year-over-year and in 2014 it was 28.7% below the level of production in 2004 (9,293.3 thousand beef cow AUs).

Texas Additional Information and Methodology

Animal agriculture is an important part of Texas's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Texas, of interest is the degree to which the industry impacts the Texas economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Texas animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Texas's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Texas which have occurred. As shown in this state report, Texas has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Texas. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Texas Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Texas's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Texas, \$2.006 to \$3.139 million in total economic activity, \$0.372 to \$0.568 in household wages and 14 to 21 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 3.1386 | \$ 0.5681 | 21.0 |
| | Hogs, Pigs, and Other | \$ 2.0056 | \$ 0.3722 | 14.2 |
| | Poultry and Eggs | \$ 2.6767 | \$ 0.4942 | 15.5 |
| | Dairy | \$ 2.3764 | \$ 0.4584 | 17.7 |

Appendix

| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|----------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| Animal Units (AUs) | Beef Cattle AUs | 9,293,250 | 8,405,250 | 8,565,000 | 8,393,250 | 7,581,750 | 7,581,750 | 7,581,750 | 9,523,500 | 8,115,900 | 7,593,150 | 6,629,400 |
| | Hog and Pig AUs | 213,945 | 209,850 | 218,100 | 221,550 | 255,150 | 264,300 | 151,050 | 151,800 | 239,850 | 354,900 | 325,350 |
| | Broiler AUs | 1,817,194 | 1,850,108 | 1,850,806 | 1,812,577 | 1,890,047 | 1,967,590 | 1,922,536 | 1,894,354 | 1,811,287 | 1,833,746 | 1,778,675 |
| | Turkey AUs | 59,969 | 61,504 | 66,830 | 47,940 | 38,319 | 37,535 | 39,097 | 39,794 | 41,083 | 34,271 | 35,792 |
| | Egg Layer AUs | 73,028 | 74,676 | 75,576 | 76,228 | 76,676 | 71,992 | 74,488 | 72,672 | 77,001 | 76,294 | 76,554 |
| | Dairy AUs | 443,800 | 445,200 | 490,000 | 532,000 | 560,000 | 602,000 | 574,000 | 595,000 | 609,000 | 609,000 | 616,000 |
| | Total Animal Units | 11,901,186 | 11,046,588 | 11,266,311 | 11,083,544 | 10,401,942 | 10,525,167 | 10,342,921 | 12,277,120 | 10,894,122 | 10,501,361 | 9,461,771 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 6,221,904 | \$ 6,045,767 | \$ 5,704,640 | \$ 6,025,583 | \$ 6,449,008 | \$ 5,481,429 | \$ 6,101,526 | \$ 8,076,312 | \$ 7,423,536 | \$ 7,536,504 | \$ 9,197,494 |
| | Hogs and Pigs (\$1,000) | \$ 90,809 | \$ 101,839 | \$ 104,926 | \$ 107,819 | \$ 131,583 | \$ 106,533 | \$ 75,023 | \$ 103,262 | \$ 266,045 | \$ 197,889 | \$ 241,847 |
| | Broilers (\$1,000) | \$ 1,424,520 | \$ 1,436,644 | \$ 1,198,800 | \$ 1,404,552 | \$ 1,592,244 | \$ 1,650,227 | \$ 1,757,083 | \$ 1,678,517 | \$ 1,747,550 | \$ 2,184,957 | \$ 2,261,860 |
| | Turkeys (\$1,000) | \$ 55,642 | \$ 59,001 | \$ 69,732 | \$ 55,287 | \$ 51,756 | \$ 34,710 | \$ 46,501 | \$ 52,154 | \$ 59,584 | \$ 39,237 | \$ 65,696 |
| | Eggs (\$1,000) | \$ 306,322 | \$ 238,798 | \$ 254,055 | \$ 373,500 | \$ 462,283 | \$ 347,480 | \$ 395,052 | \$ 421,982 | \$ 445,497 | \$ 471,264 | \$ 526,459 |
| | Milk (\$1,000) | \$ 979,467 | \$ 985,626 | \$ 950,285 | \$ 1,454,648 | \$ 1,573,792 | \$ 1,175,720 | \$ 1,509,588 | \$ 1,993,056 | \$ 1,794,452 | \$ 1,960,440 | \$ 2,536,260 |
| | Other | \$ 78,827 | \$ 82,889 | \$ 73,761 | \$ 75,786 | \$ 71,214 | \$ 84,557 | \$ 93,346 | \$ 86,389 | \$ 87,973 | \$ 89,557 | \$ 91,141 |
| | Sheep and Lambs (\$1,000) | \$ 47,769 | \$ 47,530 | \$ 34,101 | \$ 31,824 | \$ 22,951 | \$ 31,992 | \$ 36,480 | \$ 25,222 | \$ 22,504 | \$ 19,787 | \$ 17,069 |
| | Aquaculture (\$1,000) | \$ 31,058 | \$ 35,359 | \$ 39,660 | \$ 43,962 | \$ 48,263 | \$ 52,565 | \$ 56,866 | \$ 61,167 | \$ 65,469 | \$ 69,770 | \$ 74,071 |
| | Total (\$1,000) | \$ 9,157,490 | \$ 8,950,564 | \$ 8,356,199 | \$ 9,497,175 | \$ 10,331,880 | \$ 8,880,655 | \$ 9,978,119 | \$ 12,411,672 | \$ 11,824,637 | \$ 12,479,848 | \$ 14,920,757 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|------------------|-------------------|-------------------|-------------------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 123,248 | 127,974 | 124,992 | 127,726 | |
| | Cattle feedlots (112112) | 2,481 | 5,035 | 2,229 | 898 | |
| | Dairy cattle and milk production (11212) | 1,888 | 1,221 | 1,027 | 656 | |
| | Hog and pig farming (1122) | 1,785 | 1,760 | 1,732 | 1,184 | |
| | Poultry and egg production (1123) | 2,065 | 3,032 | 5,829 | 3,980 | |
| | Sheep and goat farming (1124) | 5,580 | 8,786 | 13,272 | 15,603 | |
| | Animal aquaculture and other animal production (1125,1129) | 9,703 | 23,378 | 28,622 | 26,587 | |
| Value of Sales (\$1,000) | Cattle and Calves | 7,271,061 | 8,083,024 | 10,503,774 | 13,013,127 | |
| | Hogs and Pigs | 116,079 | 128,231 | 237,504 | 239,358 | |
| | Poultry and Eggs | 1,164,596 | 1,260,951 | 2,113,086 | 2,624,759 | |
| | Milk and Other Dairy Products | 741,735 | 676,703 | 1,245,441 | 1,698,264 | |
| | Aquaculture | 20,403 | 31,058 | 46,102 | 82,033 | |
| | Other (calculated) | 226,460 | 223,026 | 289,592 | 201,944 | |
| | Total | 9,540,334 | 10,402,993 | 14,435,499 | 17,859,485 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 61,645 | 65,435 | 55,194 | 61,054 |
| | | \$1,000 | 3,221,969 | 4,524,369 | 6,017,794 | 6,860,573 |
| | Breeding livestock purchased | (Farms) | <i>n/a</i> | 43,559 | 36,667 | 39,929 |
| | | \$1,000 | <i>n/a</i> | 186,906 | 420,373 | 418,586 |
| | Other livestock and poultry purchased | (Farms) | <i>n/a</i> | 30,388 | 25,541 | 29,879 |
| | | \$1,000 | <i>n/a</i> | 4,337,463 | 5,597,421 | 6,441,987 |
| Feed purchased | (Farms) | 130,839 | 167,033 | 158,144 | 185,019 | |
| | \$1,000 | 2,868,805 | 2,700,281 | 4,226,444 | 7,272,692 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|----------------------|---------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 28,867,255 | \$ 5,225,096 | 193,382 | \$ 1,062,262 |
| | Hogs, Pigs, and Other | \$ 667,840 | \$ 123,938 | 4,727 | \$ 25,197 |
| | Poultry and Eggs | \$ 7,639,343 | \$ 1,410,454 | 44,362 | \$ 286,745 |
| | Dairy | \$ 6,027,168 | \$ 1,162,622 | 44,974 | \$ 236,361 |
| | Total | \$ 43,201,606 | \$ 7,922,110 | 287,445 | \$ 1,610,565 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 4,394,006 | \$ 795,334 | 29,435 | \$ 161,691 |
| | Hogs, Pigs, and Other | \$ 241,463 | \$ 44,811 | 1,709 | \$ 9,110 |
| | Poultry and Eggs | \$ 1,646,525 | \$ 303,998 | 9,561 | \$ 61,803 |
| | Dairy | \$ 3,110,133 | \$ 599,935 | 23,208 | \$ 121,967 |
| | Total | \$ 9,392,126 | \$ 1,744,078 | 63,914 | \$ 354,571 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 3.1386 | \$ 0.5681 | 21.0 | |
| | Hogs, Pigs, and Other | \$ 2.0056 | \$ 0.3722 | 14.2 | |
| | Poultry and Eggs | \$ 2.6767 | \$ 0.4942 | 15.5 | |
| | Dairy | \$ 2.3764 | \$ 0.4584 | 17.7 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 0.0% | |
| | Total | | | 20.3% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: UTAH

Utah Executive Summary

The use of soybean meal as a key feed ingredient is a modest part of Utah's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Utah. The success of Utah animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Utah during 2014 animal agriculture contributed:

- \$3.3 billion in economic output
- 19,682 jobs
- \$608.7 million in earnings
- \$154.2 million in income taxes paid at local, state, and federal levels
- \$34.0 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Utah increased economic output by over \$894.0 million, boosted household earnings by \$164.9 million, contributed 5,357 additional jobs and paid \$41.8 million in additional tax revenues.

Utah's animal agriculture consumed about 156.2 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (74.7 thousand tons)
- Turkeys (33.9 thousand tons)
- Egg-Laying Hens (25.2 thousand tons)

This report examines animal agriculture in Utah over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Utah, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Utah and beyond.

Utah Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Utah's economy. In 2014, Utah's animal agriculture contributed the following to the economy:

- About \$3.3 billion in economic output
- \$608.7 million in household earnings
- 19,682 jobs
- \$154.2 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Utah's animal agriculture has:

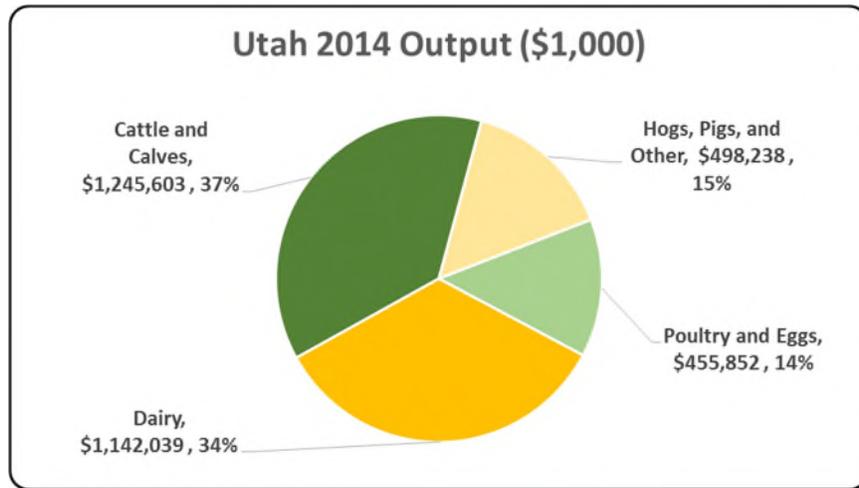
- Increased economic output by \$894.0 million
- Boosted household earnings by \$164.9 million
- Added 5,357 jobs
- Paid an additional \$41.8 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 3,341,731 | \$ 894,025 | 36.53% |
| Earnings (\$1,000) | \$ 608,658 | \$ 164,879 | 37.15% |
| Employment (Jobs) | 19,682 | 5,357 | 37.39% |
| Income Taxes Paid (\$1,000) | \$ 154,173 | \$ 41,764 | 37.15% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 33,965 | | |

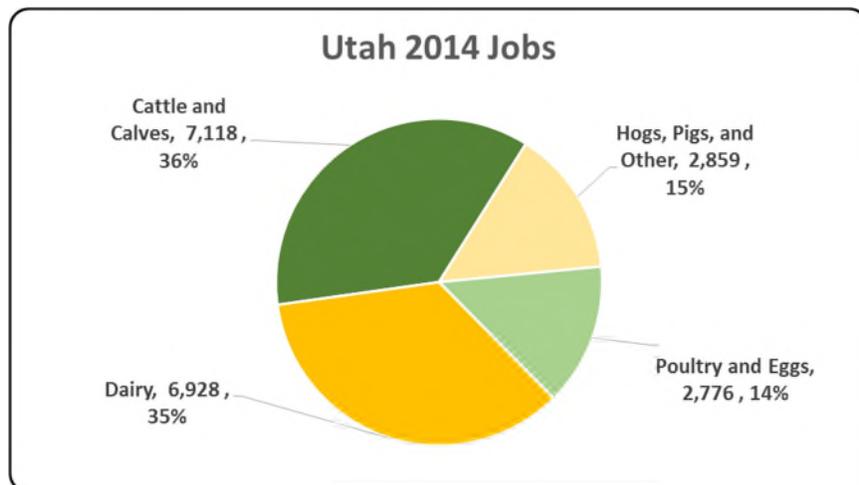
Utah Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Utah economy. Animal agriculture’s impact on Utah total economic output is about \$3.3 billion.



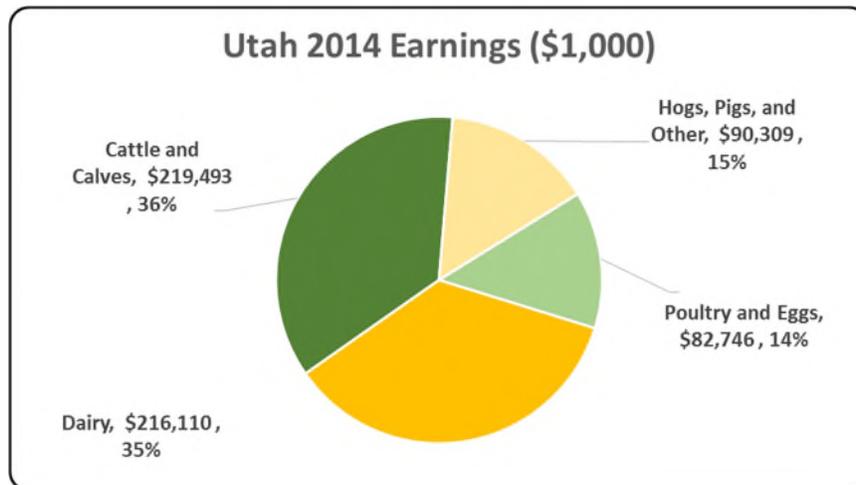
Utah Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Utah in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Utah total jobs, contributing 19,682 jobs within and outside of animal agriculture.



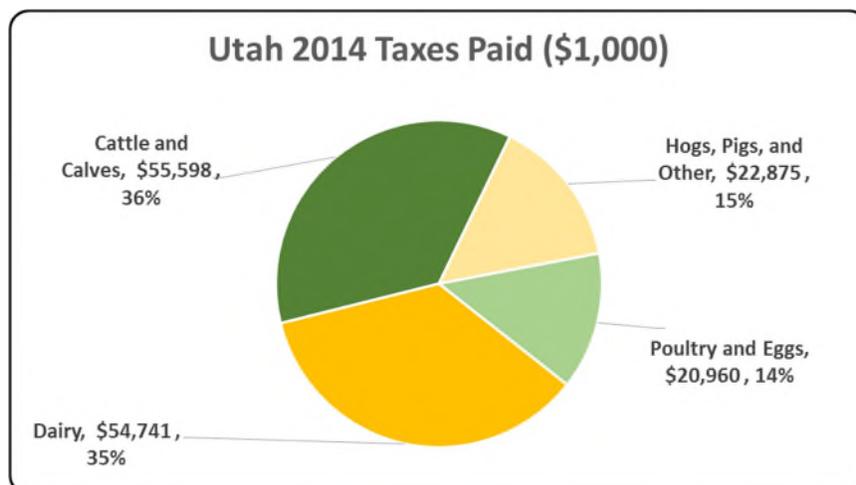
Utah Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Utah economy in terms of earnings. Utah’s animal agriculture contributed about \$608.7 million to household earnings in 2014.



Utah Taxes Paid by Animal Agriculture

Utah’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$154.2 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$34.0 million in property taxes paid by all of Utah agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



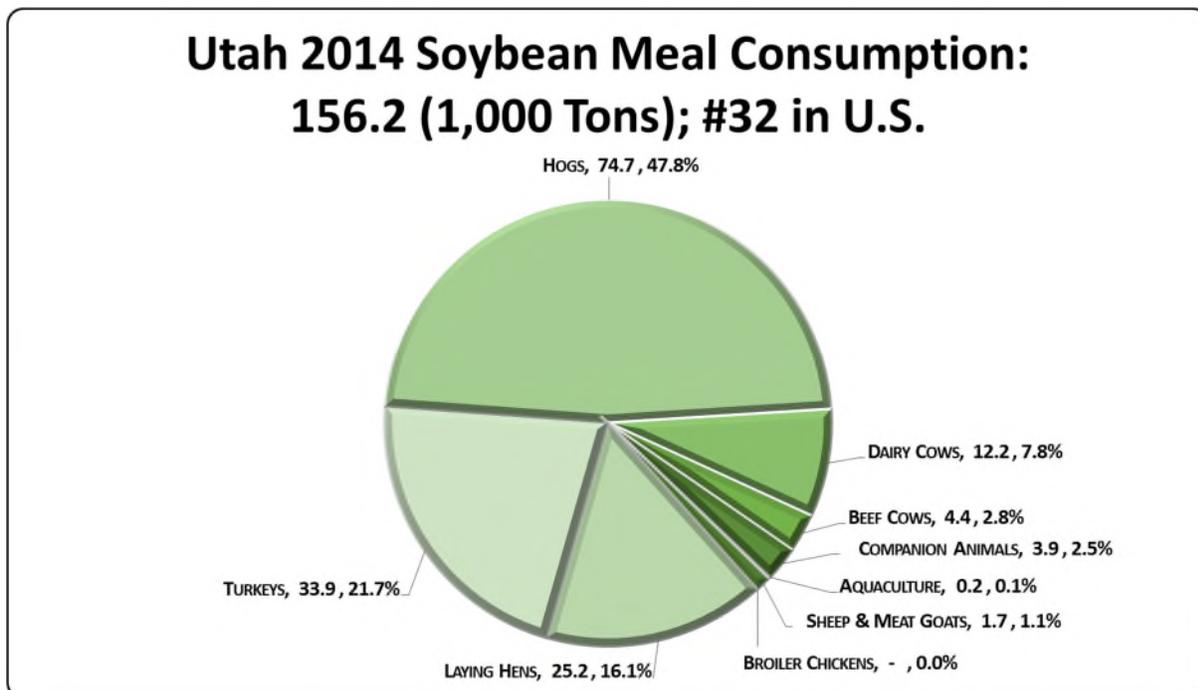
Utah Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Utah's animal agriculture consumed almost 156.2 thousand tons of soybean meal in 2014, placing the state as #32 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (74.7 thousand tons)
- Turkeys (33.9 thousand tons)
- Egg-Laying Hens (25.2 thousand tons)

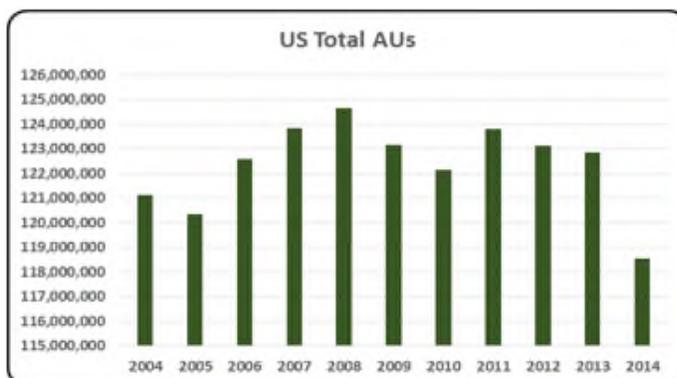


Utah Animal Unit (AU) Trends

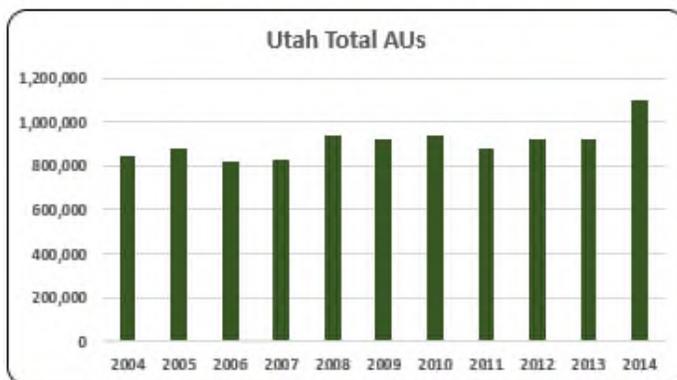
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Utah. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Utah and to give perspective on Utah's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

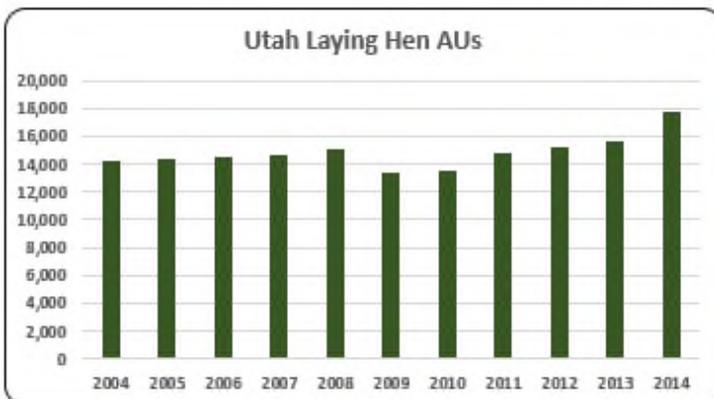
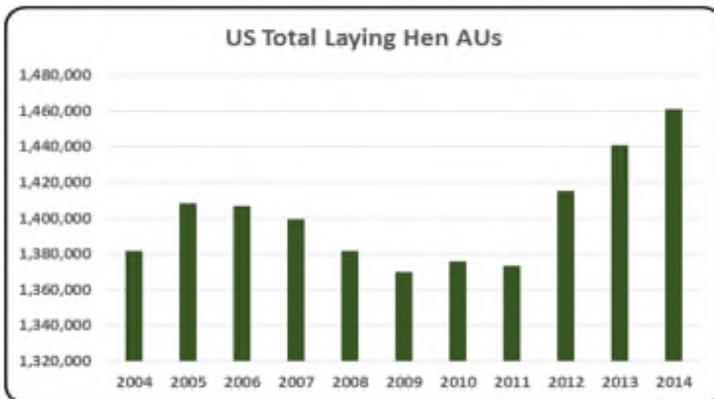
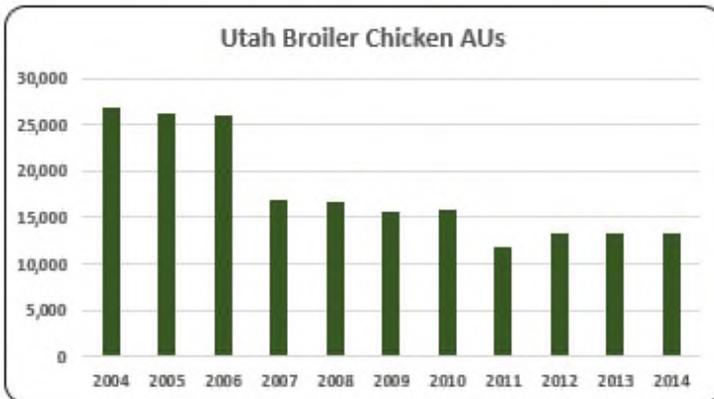
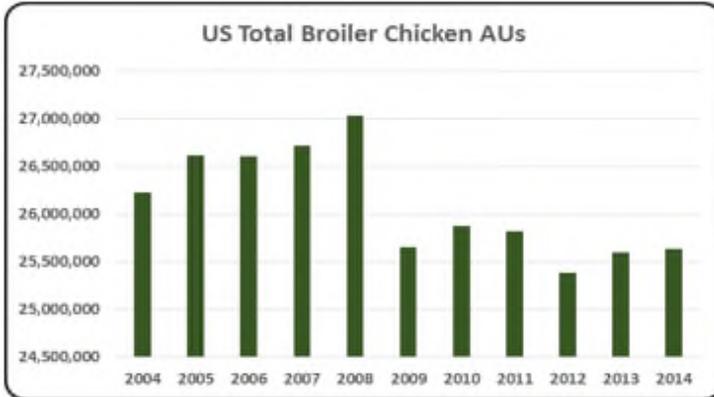
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Utah, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (651.0 thousand AUs), Hogs (221.9 thousand AUs), and Dairy Cows (133.0 thousand AUs). Total animal units in Utah during 2014 were 1,096.9 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- Less than 1% (0.93%, 1,096.9 thousand) of animal production in the U.S. was in Utah in 2014. Animal production in Utah in 2014 was 29.5% above animal production a decade earlier (847,118 AUs).

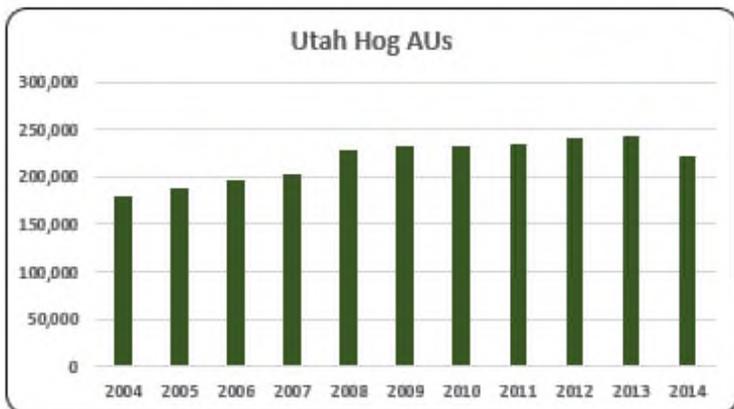
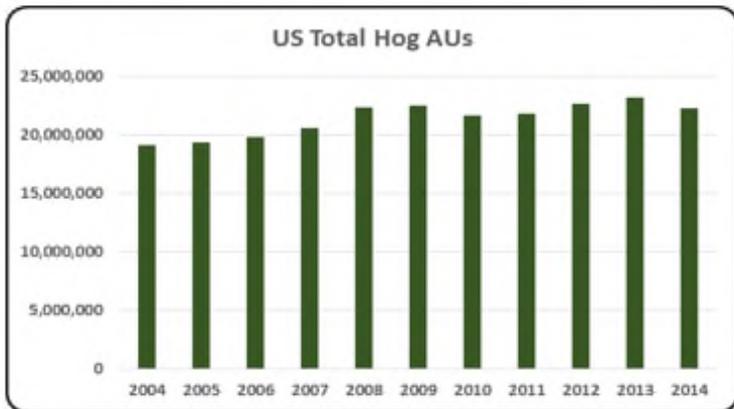
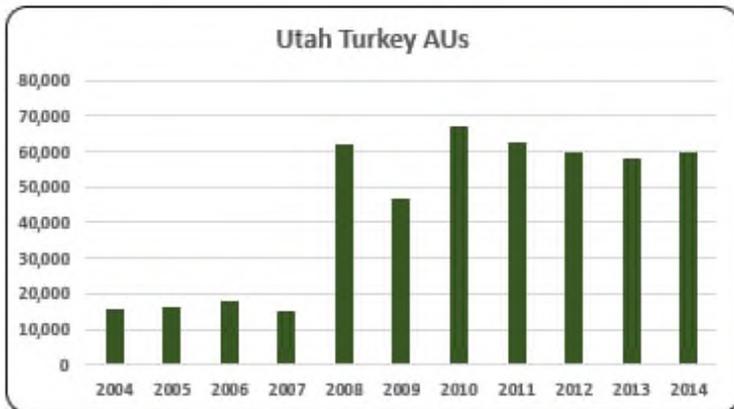
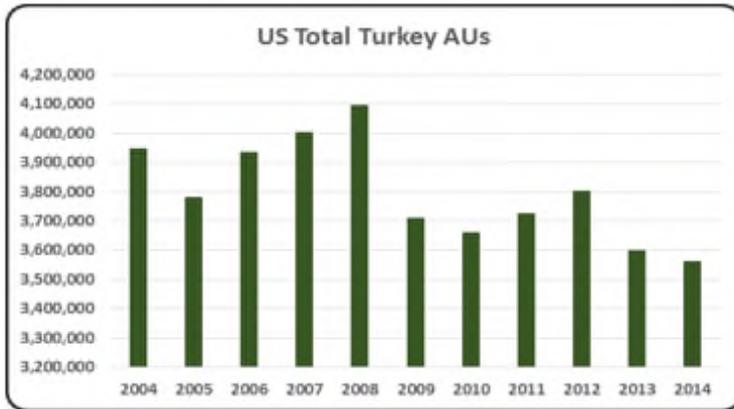


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

- Only 1.2% (13,195 broiler AUs) of all animal production in Utah in 2014 was concentrated in broiler production. Broiler production in 2004 (26,775 broiler AUs) was 50.7% above 2014 broiler production.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

- Utah layer production was only 1.62% (17,769 layer AUs) of all animal production in 2014. Layer production in 2014 was 24.8% higher than a decade earlier (14,234 layer AUs).

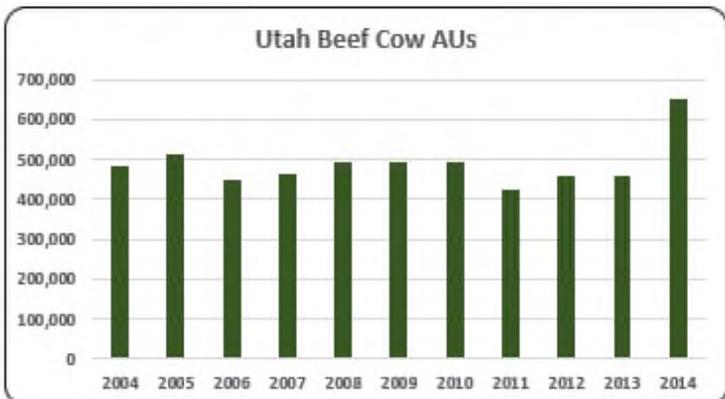
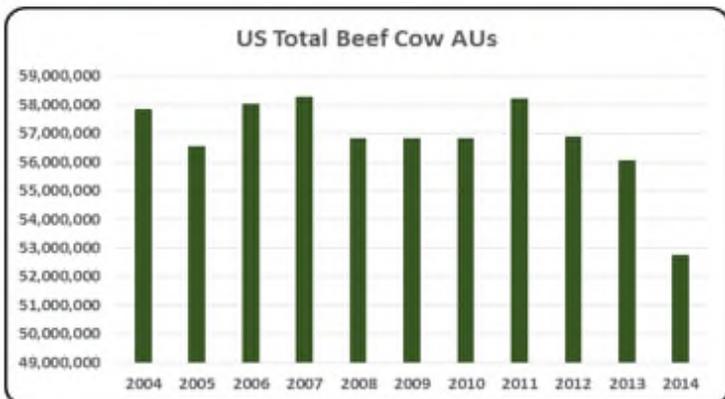
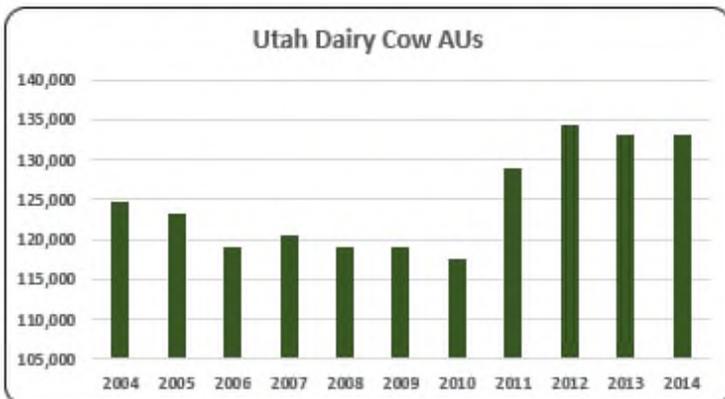
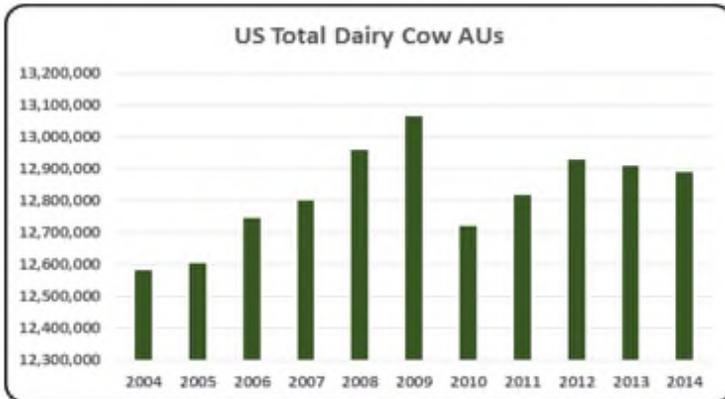


- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

- Turkey production in 2014 (59,981 turkey AUs) was 275.8% higher than production in 2007 (15,959 turkey AUs).

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

- There were 221,925 hog AUs in Utah in 2014. Hog AUs decreased 8.5% from 2013, however hog production in 2014 was 23.3% higher than ten years earlier (180,000 hog AUs).



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.

- There were, on average, 124,727 dairy cow AUs during the 2004- 2014 period. The level of dairy cow AUs in 2014 (133,000) was 6.7% above the level of dairy cow AUs in 2004 (124,600).

- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.

- About 59.35% of all animal production in Utah in 2014 was concentrated in beef cow production. Beef cow AUs in 2014 (651,000 beef cow AUs) were 34.1% larger than in 2014 (485,550 beef cow AUs).

Utah Additional Information and Methodology

Animal agriculture is an important part of Utah's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Utah, of interest is the degree to which the industry impacts the Utah economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Utah animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Utah's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Utah which have occurred. As shown in this state report, Utah has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Utah. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Utah Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Utah's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Utah, \$1.988 to \$2.549 million in total economic activity, \$0.360 to \$0.449 in household wages and 11 to 15 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.5486 | \$ 0.4491 | 14.6 |
| | Hogs, Pigs, and Other | \$ 1.9878 | \$ 0.3603 | 11.4 |
| | Poultry and Eggs | \$ 2.3408 | \$ 0.4249 | 14.3 |
| | Dairy | \$ 2.2084 | \$ 0.4179 | 13.4 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 485,550 | 510,750 | 449,850 | 461,850 | 492,450 | 492,450 | 492,450 | 425,700 | 459,825 | 456,150 | 651,000 |
| | Hog and Pig AUs | 180,000 | 188,250 | 195,450 | 202,200 | 229,050 | 233,100 | 232,350 | 233,850 | 240,450 | 242,475 | 221,925 |
| | Broiler AUs | 26,775 | 26,212 | 26,035 | 16,987 | 16,722 | 15,548 | 15,757 | 11,873 | 13,317 | 13,270 | 13,195 |
| | Turkey AUs | 15,959 | 16,368 | 17,785 | 15,197 | 61,898 | 46,890 | 67,292 | 62,809 | 59,892 | 57,932 | 59,981 |
| | Egg Layer AUs | 14,234 | 14,321 | 14,451 | 14,617 | 15,069 | 13,360 | 13,584 | 14,848 | 15,220 | 15,603 | 17,769 |
| | Dairy AUs | 124,600 | 123,200 | 119,000 | 120,400 | 119,000 | 119,000 | 117,600 | 128,800 | 134,400 | 133,000 | 133,000 |
| | Total Animal Units | 847,118 | 879,101 | 822,571 | 831,250 | 934,189 | 920,348 | 939,032 | 877,880 | 923,104 | 918,430 | 1,096,870 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 342,533 | \$ 351,595 | \$ 250,377 | \$ 222,428 | \$ 194,220 | \$ 185,264 | \$ 231,323 | \$ 272,474 | \$ 302,585 | \$ 374,285 | \$ 488,740 |
| | Hogs and Pigs (\$1,000) | \$ 157,128 | \$ 164,344 | \$ 139,583 | \$ 152,190 | \$ 163,240 | \$ 153,912 | \$ 184,623 | \$ 209,304 | \$ 192,252 | \$ 210,555 | \$ 230,964 |
| | Broilers (\$1,000) | \$ 22,520 | \$ 21,332 | \$ 16,485 | \$ 12,779 | \$ 13,152 | \$ 11,392 | \$ 11,991 | \$ 10,564 | \$ 13,266 | \$ 16,161 | \$ 16,954 |
| | Turkeys (\$1,000) | \$ 14,808 | \$ 15,702 | \$ 18,558 | \$ 17,526 | \$ 60,877 | \$ 40,800 | \$ 75,189 | \$ 71,849 | \$ 76,267 | \$ 72,352 | \$ 71,148 |
| | Eggs (\$1,000) | \$ 36,012 | \$ 23,248 | \$ 30,727 | \$ 52,618 | \$ 72,422 | \$ 52,470 | \$ 64,329 | \$ 70,840 | \$ 72,537 | \$ 81,139 | \$ 106,640 |
| | Milk (\$1,000) | \$ 252,613 | \$ 245,828 | \$ 221,869 | \$ 327,348 | \$ 321,456 | \$ 216,062 | \$ 312,174 | \$ 403,956 | \$ 382,272 | \$ 415,545 | \$ 517,134 |
| | Other | \$ 19,241 | \$ 21,817 | \$ 17,332 | \$ 16,712 | \$ 18,198 | \$ 18,003 | \$ 22,294 | \$ 19,427 | \$ 19,513 | \$ 19,599 | \$ 19,684 |
| | Sheep and Lambs (\$1,000) | \$ 18,694 | \$ 21,258 | \$ 16,761 | \$ 16,129 | \$ 17,603 | \$ 17,395 | \$ 21,674 | \$ 18,796 | \$ 18,869 | \$ 18,943 | \$ 19,016 |
| | Aquaculture (\$1,000) | \$ 547 | \$ 559 | \$ 571 | \$ 583 | \$ 595 | \$ 608 | \$ 620 | \$ 632 | \$ 644 | \$ 656 | \$ 668 |
| | Total (\$1,000) | \$ 844,855 | \$ 843,866 | \$ 694,931 | \$ 801,601 | \$ 843,565 | \$ 677,903 | \$ 901,922 | \$ 1,058,415 | \$ 1,058,692 | \$ 1,189,636 | \$ 1,451,264 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|----------------|----------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 5,309 | 4,202 | 5,183 | 5,231 | |
| | Cattle feedlots (112112) | 433 | 583 | 415 | 126 | |
| | Dairy cattle and milk production (11212) | 614 | 464 | 335 | 248 | |
| | Hog and pig farming (1122) | 114 | 179 | 205 | 199 | |
| | Poultry and egg production (1123) | 171 | 334 | 359 | 214 | |
| | Sheep and goat farming (1124) | 667 | 582 | 895 | 763 | |
| | Animal aquaculture and other animal production (1125,1129) | 1,878 | 3,482 | 2,813 | 3,760 | |
| Value of Sales (\$1,000) | Cattle and Calves | 260,758 | 371,418 | 347,299 | 364,214 | |
| | Hogs and Pigs | 40,758 | 153,112 | 196,595 | 290,632 | |
| | Poultry and Eggs | 68,129 | 84,178 | 140,359 | 140,131 | |
| | Milk and Other Dairy Products | 196,448 | 196,812 | 292,141 | 326,364 | |
| | Aquaculture | 1,931 | 5,746 | 4,074 | 6,709 | |
| | Other (calculated) | 65,219 | 46,835 | 62,813 | 93,368 | |
| | Total | 633,243 | 858,101 | 1,043,281 | 1,221,418 | |
| Input Purchases | Livestock and poultry purchased | (Farms) | 5,266 | 5,172 | 4,826 | 6,025 |
| | | \$1,000 | 82,463 | 158,687 | 132,323 | 114,862 |
| | Breeding livestock purchased | (Farms) | n/a | 2,702 | 2,864 | 3,353 |
| | | \$1,000 | n/a | 18,789 | 31,074 | 38,315 |
| | Other livestock and poultry purchased | (Farms) | n/a | 3,092 | 2,836 | 3,566 |
| | | \$1,000 | n/a | 139,898 | 101,250 | 76,547 |
| | Feed purchased | (Farms) | 7,655 | 9,479 | 9,214 | 11,921 |
| | | \$1,000 | 198,854 | 244,175 | 389,568 | 611,302 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,245,603 | \$ 219,493 | 7,118 | \$ 55,598 |
| | Hogs, Pigs, and Other | \$ 498,238 | \$ 90,309 | 2,859 | \$ 22,875 |
| | Poultry and Eggs | \$ 455,852 | \$ 82,746 | 2,776 | \$ 20,960 |
| | Dairy | \$ 1,142,039 | \$ 216,110 | 6,928 | \$ 54,741 |
| | Total | \$ 3,341,731 | \$ 608,658 | 19,682 | \$ 154,173 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 151,555 | \$ 26,706 | 866 | \$ 6,765 |
| | Hogs, Pigs, and Other | \$ 58,872 | \$ 10,671 | 338 | \$ 2,703 |
| | Poultry and Eggs | \$ 240,703 | \$ 43,692 | 1,466 | \$ 11,067 |
| | Dairy | \$ 442,896 | \$ 83,810 | 2,687 | \$ 21,229 |
| | Total | \$ 894,025 | \$ 164,879 | 5,357 | \$ 41,764 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.5486 | \$ 0.4491 | 14.6 | |
| | Hogs, Pigs, and Other | \$ 1.9878 | \$ 0.3603 | 11.4 | |
| | Poultry and Eggs | \$ 2.3408 | \$ 0.4249 | 14.3 | |
| | Dairy | \$ 2.2084 | \$ 0.4179 | 13.4 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 5.0% |
| | Total | | | | 25.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: VERMONT

Vermont Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Vermont's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Vermont. The success of Vermont animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Vermont during 2014 animal agriculture contributed:

- \$1.6 billion in economic output
- 11,233 jobs
- \$279.6 million in earnings
- \$75.8 million in income taxes paid at local, state, and federal levels
- \$34.0 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Vermont increased economic output by over \$396.8 million, boosted household earnings by \$67.0 million, contributed 2,656 additional jobs and paid \$18.2 million in additional tax revenues.

Vermont's animal agriculture consumed about 39.3 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (22.4 thousand tons)
- Turkeys (11.7 thousand tons)
- Egg-Laying Hens (2.9 thousand tons)

This report examines animal agriculture in Vermont over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Vermont, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Vermont and beyond.

Vermont Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Vermont's economy. In 2014, Vermont's animal agriculture contributed the following to the economy:

- About \$1,636.0 million in economic output
- \$279.6 million in household earnings
- 11,233 jobs
- \$75.8 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Vermont's animal agriculture has:

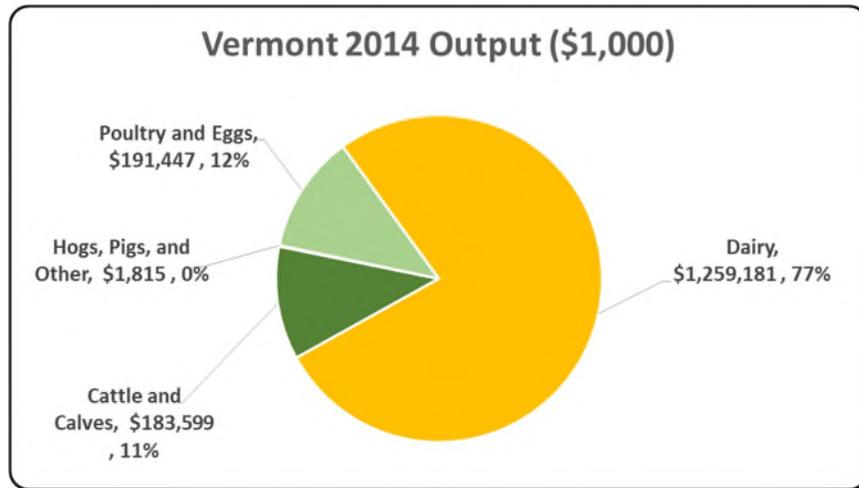
- Increased economic output by \$396.8 million
- Boosted household earnings by \$67.0 million
- Added 2,656 jobs
- Paid an additional \$18.2 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 1,636,043 | \$ 396,815 | 32.02% |
| Earnings (\$1,000) | \$ 279,551 | \$ 67,023 | 31.54% |
| Employment (Jobs) | 11,233 | 2,656 | 30.97% |
| Income Taxes Paid (\$1,000) | \$ 75,842 | \$ 18,183 | 31.54% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 34,005 | | |

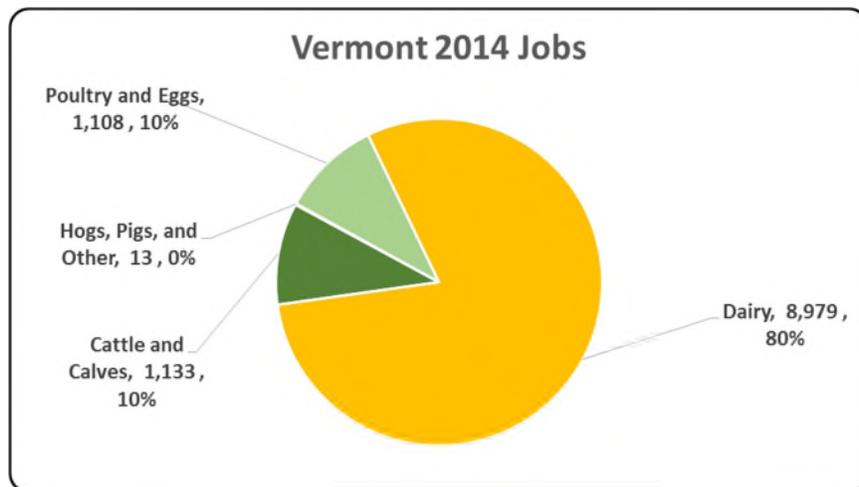
Vermont Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Vermont economy. Animal agriculture’s impact on Vermont total economic output is about \$1.6 billion.



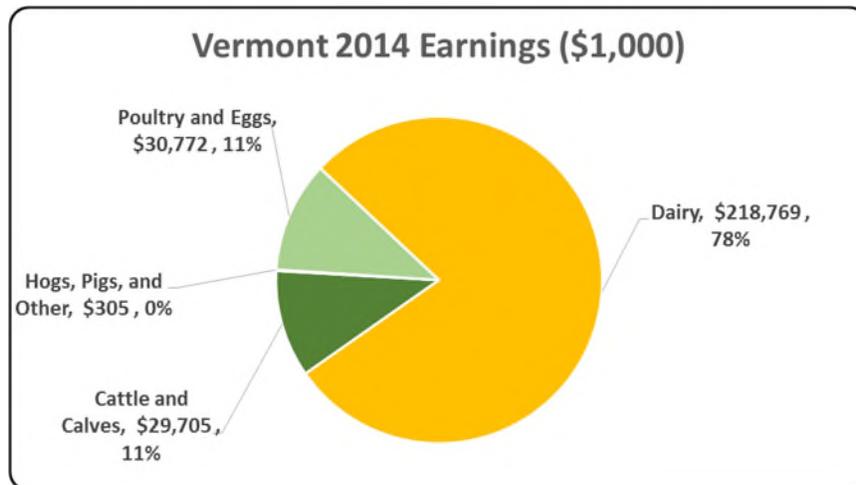
Vermont Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Vermont in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Vermont total jobs, contributing 11,233 jobs within and outside of animal agriculture.



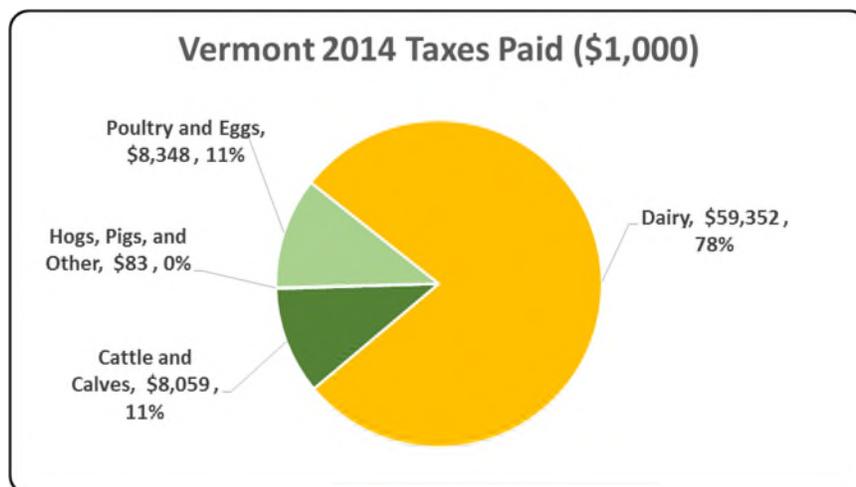
Vermont Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Vermont economy in terms of earnings. Vermont’s animal agriculture contributed about \$279.6 million to household earnings in 2014.



Vermont Taxes Paid by Animal Agriculture

Vermont’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$75.8 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$34.0 million in property taxes paid by all of Vermont agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



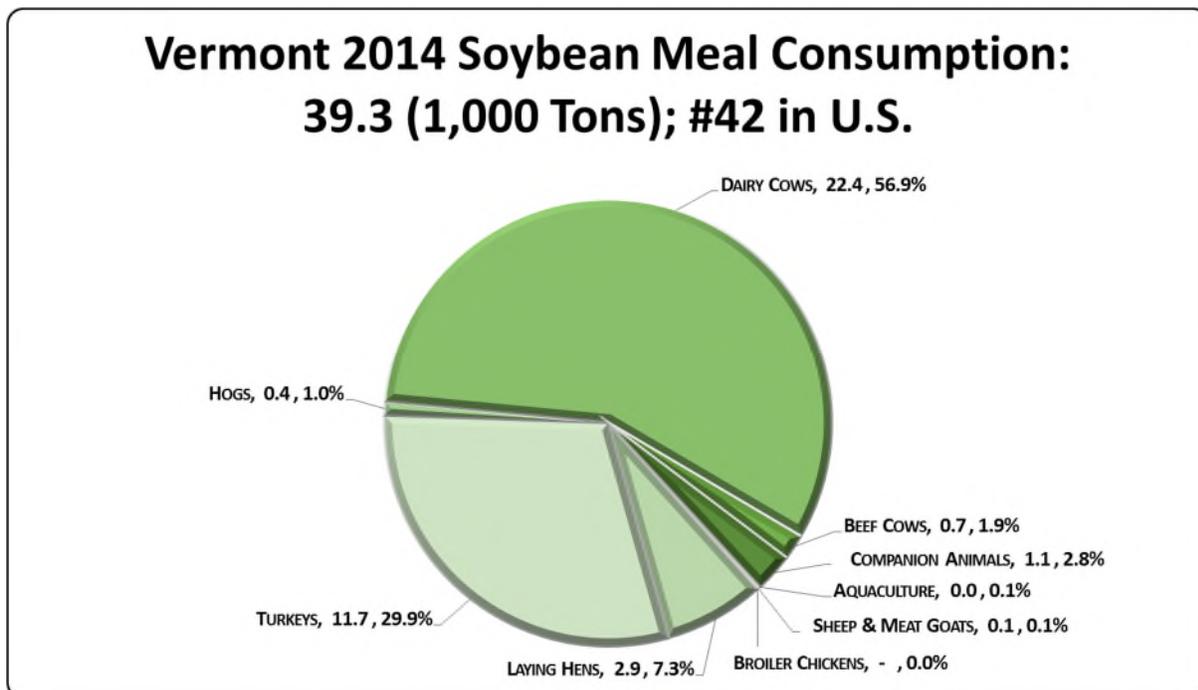
Vermont Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Vermont's animal agriculture consumed almost 39.3 thousand tons of soybean meal in 2014, placing the state as #42 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (22.4 thousand tons)
- Turkeys (11.7 thousand tons)
- Egg-Laying Hens (2.9 thousand tons)

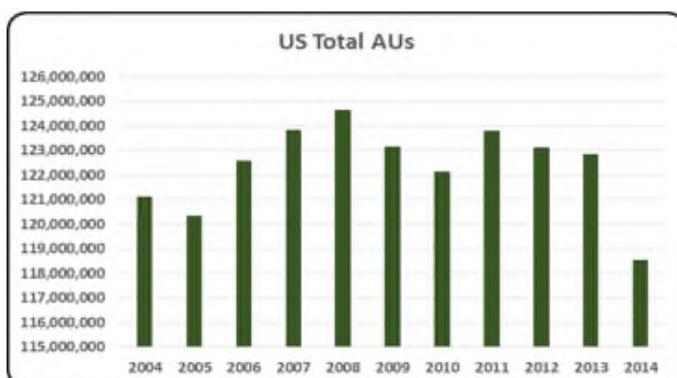


Vermont Animal Unit (AU) Trends

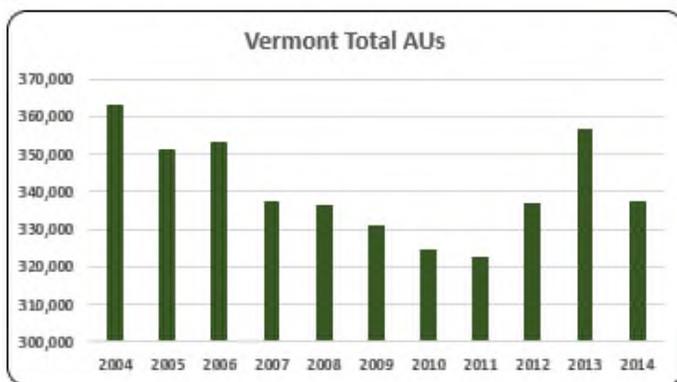
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Vermont. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Vermont and to give perspective on Vermont's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

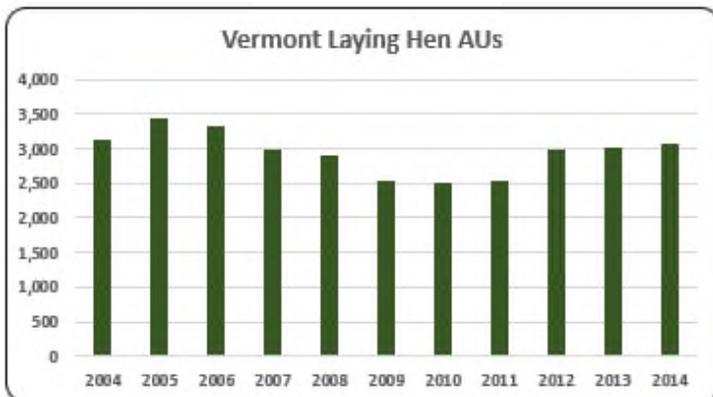
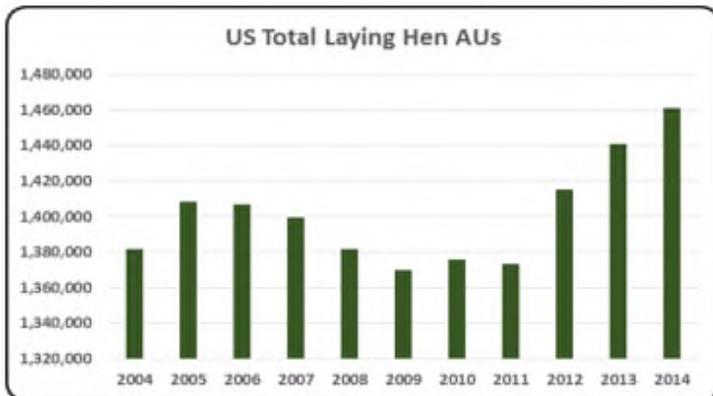
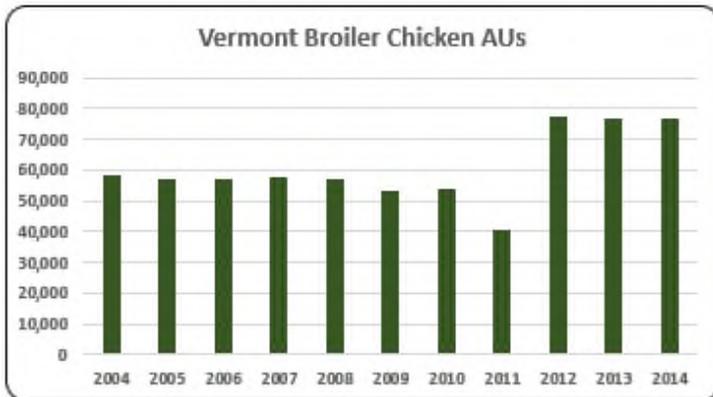
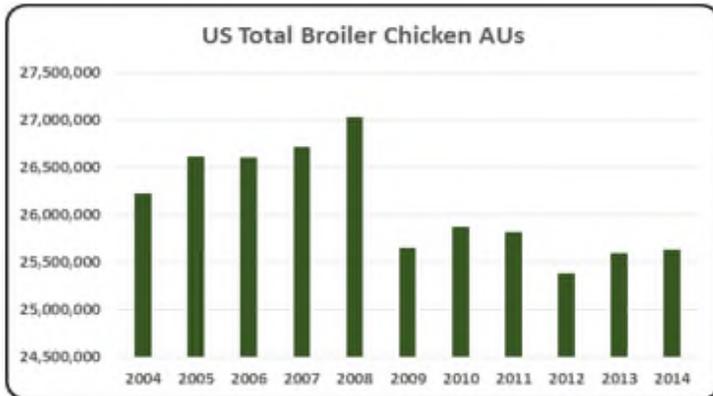
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Vermont, the largest three segments of animal agriculture in terms of AUs during 2014 were: Dairy Cows (184.8 thousand AUs), Broilers (76.5 thousand AUs), and Beef Cows (71.6 thousand AUs). Total animal units in Vermont during 2014 were 337.4 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- Animal production in Vermont during the last decade was very small. In 2014 of all animal production in the U.S. only 0.28% (337,395 AUs) was located in Vermont.

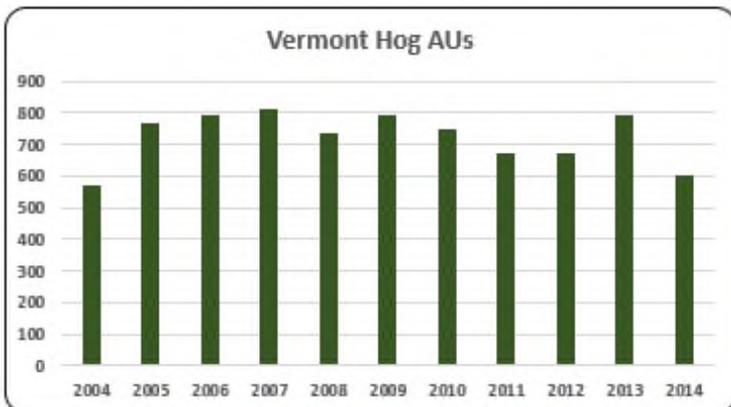
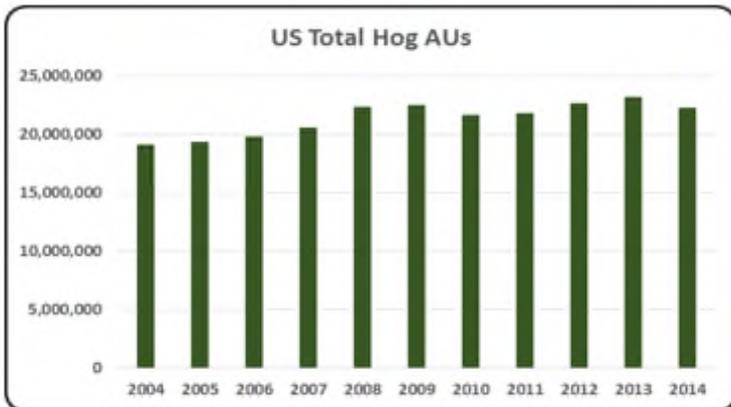
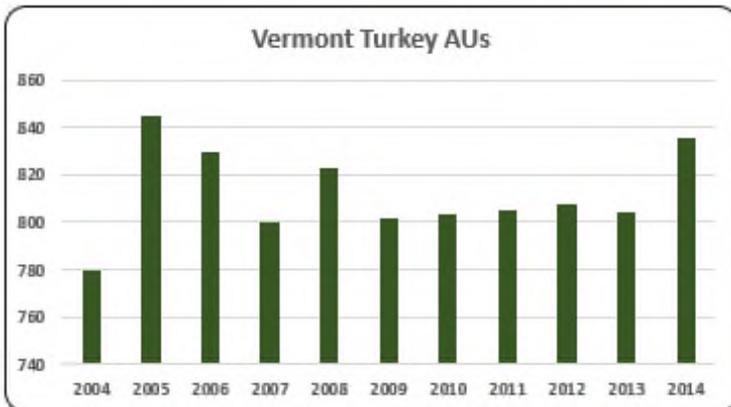
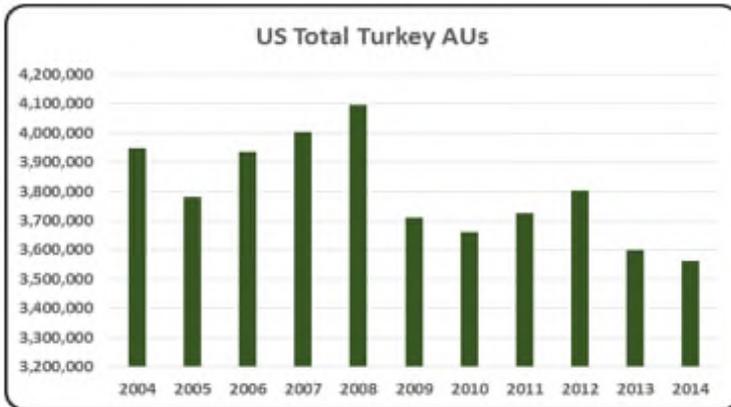


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

- There were 76,460 broiler AUs in Vermont in 2014. This represented 22.7% of all AUs in the state. Broiler production increased from 2012-2014 to an average of 76,840 per year in contrast to the average production between the 2004-2011 (54,300 broiler AUs) years.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

- There were 3,075 layer AUs in 2014. 2005 was a high year for layer production in Vermont with 3,445 layer AUs.

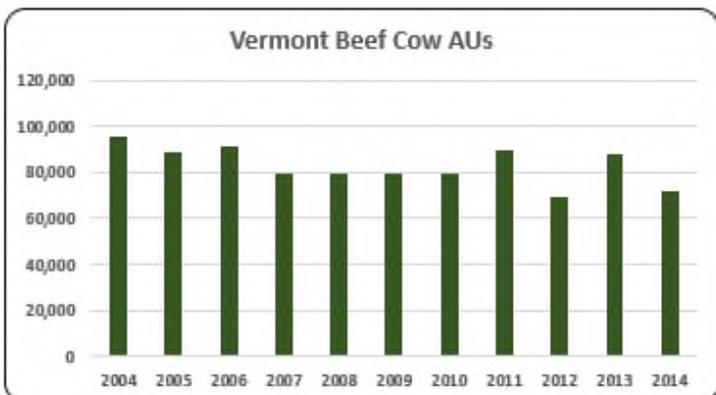
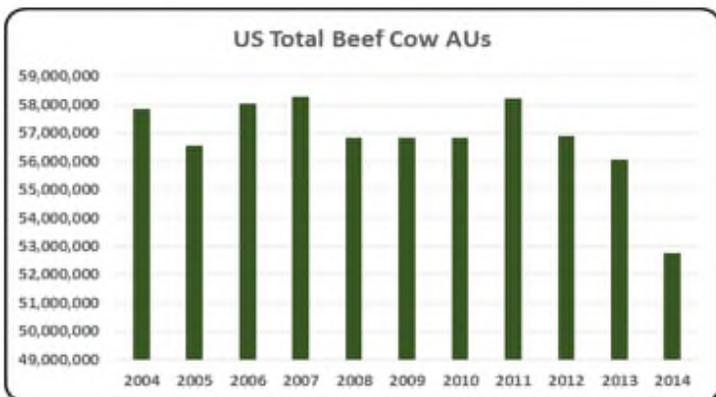
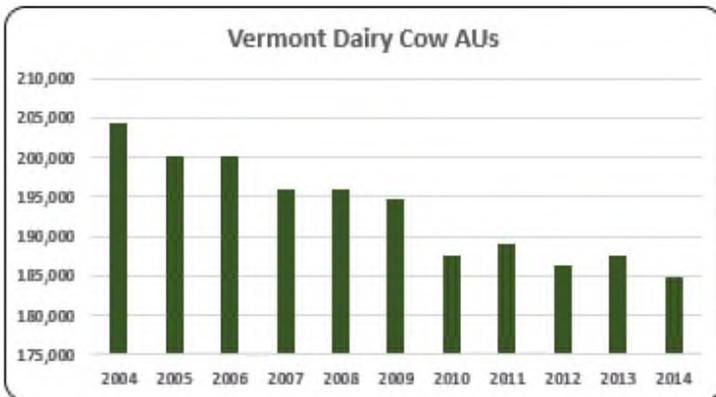
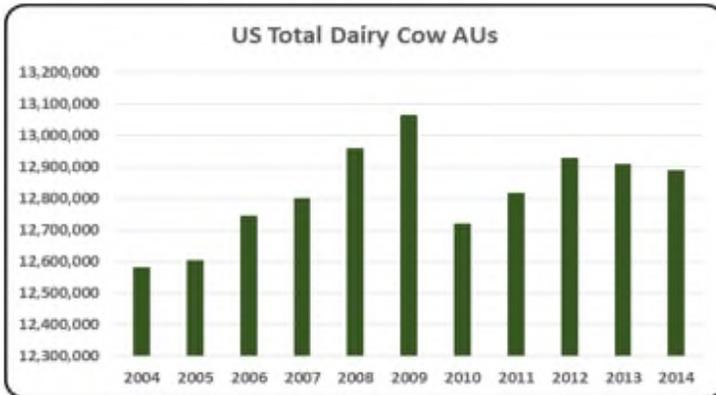


- From 2004 to 2014, the U.S. accounted for 50% of the world's turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

- Only 0.25% (835 turkey AUs) of all AUs in Vermont were in turkey production in 2014.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

- Vermont hog AUs had an average of 724 from 2004 to 2014.



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.

- In 2014 dairy cow production accounted for 54.77% (184,800 dairy cow AUs) of all animal production in the state. Dairy cow AUs in 2014 were 9.6% below 2004 (204,400 dairy cow AUs).

- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.

- About 21.23% (71,625 beef cow AUs) of AUs in Vermont came from beef cow production in 2014. The beef cow AUs in 2014 were 25.3% less than 2004 (95,850 beef cow AUs).

Vermont Additional Information and Methodology

Animal agriculture is an important part of Vermont's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Vermont, of interest is the degree to which the industry impacts the Vermont economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Vermont animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Vermont's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Vermont which have occurred. As shown in this state report, Vermont has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Vermont. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Vermont Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Vermont's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Vermont, \$1.610 to \$1.979 million in total economic activity, \$0.271 to \$0.322 in household wages and 11 to 13 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.9791 | \$ 0.3202 | 12.2 |
| | Hogs, Pigs, and Other | \$ 1.6098 | \$ 0.2706 | 11.2 |
| | Poultry and Eggs | \$ 1.8310 | \$ 0.2943 | 10.6 |
| | Dairy | \$ 1.8522 | \$ 0.3218 | 13.2 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Animal Units (AUs) | Beef Cattle AUs | 95,850 | 88,950 | 91,200 | 79,125 | 79,050 | 79,050 | 79,050 | 89,175 | 69,045 | 87,525 | 71,625 |
| | Hog and Pig AUs | 570 | 765 | 795 | 810 | 735 | 795 | 750 | 675 | 675 | 795 | 600 |
| | Broiler AUs | 58,346 | 57,118 | 56,732 | 57,930 | 57,026 | 53,021 | 53,734 | 40,489 | 77,166 | 76,896 | 76,460 |
| | Turkey AUs | 780 | 844 | 830 | 800 | 823 | 802 | 803 | 805 | 808 | 804 | 835 |
| | Egg Layer AUs | 3,128 | 3,445 | 3,324 | 2,974 | 2,889 | 2,527 | 2,510 | 2,525 | 2,981 | 3,027 | 3,075 |
| | Dairy AUs | 204,400 | 200,200 | 200,200 | 196,000 | 196,000 | 194,600 | 187,600 | 189,000 | 186,200 | 187,600 | 184,800 |
| | Total Animal Units | 363,074 | 351,322 | 353,081 | 337,638 | 336,523 | 330,794 | 324,447 | 322,669 | 336,874 | 356,647 | 337,395 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 38,751 | \$ 43,886 | \$ 41,118 | \$ 45,503 | \$ 43,469 | \$ 39,438 | \$ 40,186 | \$ 57,745 | \$ 72,300 | \$ 68,087 | \$ 92,769 |
| | Hogs and Pigs (\$1,000) | \$ 342 | \$ 315 | \$ 360 | \$ 384 | \$ 390 | \$ 501 | \$ 581 | \$ 814 | \$ 871 | \$ 883 | \$ 989 |
| | Broilers (\$1,000) | \$ 49,074 | \$ 46,485 | \$ 35,923 | \$ 43,579 | \$ 44,851 | \$ 38,850 | \$ 40,891 | \$ 36,027 | \$ 76,870 | \$ 93,647 | \$ 98,239 |
| | Turkeys (\$1,000) | \$ 1,841 | \$ 1,792 | \$ 1,857 | \$ 1,897 | \$ 1,905 | \$ 1,928 | \$ 1,952 | \$ 1,975 | \$ 1,998 | \$ 2,022 | \$ 2,045 |
| | Eggs (\$1,000) | \$ 3,418 | \$ 2,434 | \$ 2,427 | \$ 4,271 | \$ 5,252 | \$ 3,782 | \$ 3,769 | \$ 4,384 | \$ 4,855 | \$ 3,701 | \$ 4,275 |
| | Milk (\$1,000) | \$ 438,386 | \$ 422,560 | \$ 355,104 | \$ 521,386 | \$ 502,320 | \$ 340,722 | \$ 446,217 | \$ 548,208 | \$ 503,524 | \$ 555,078 | \$ 679,830 |
| | Other | \$ 74 | \$ 80 | \$ 87 | \$ 93 | \$ 100 | \$ 106 | \$ 113 | \$ 119 | \$ 126 | \$ 132 | \$ 139 |
| | Sheep and Lambs (\$1,000) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| | Aquaculture (\$1,000) | \$ 74 | \$ 80 | \$ 87 | \$ 93 | \$ 100 | \$ 106 | \$ 113 | \$ 119 | \$ 126 | \$ 132 | \$ 139 |
| | Total (\$1,000) | \$ 531,886 | \$ 517,552 | \$ 436,875 | \$ 617,113 | \$ 598,286 | \$ 425,327 | \$ 533,708 | \$ 649,272 | \$ 660,544 | \$ 723,550 | \$ 878,285 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|---------|---------|---------|---------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 858 | 647 | 668 | 862 | |
| | Cattle feedlots (112112) | 62 | 92 | 61 | 18 | |
| | Dairy cattle and milk production (11212) | 1,767 | 1,367 | 1,141 | 904 | |
| | Hog and pig farming (1122) | 42 | 45 | 26 | 57 | |
| | Poultry and egg production (1123) | 59 | 102 | 235 | 203 | |
| | Sheep and goat farming (1124) | 220 | 248 | 371 | 390 | |
| | Animal aquaculture and other animal production (1125,1129) | 392 | 763 | 855 | 1,035 | |
| Value of Sales (\$1,000) | Cattle and Calves | 36,551 | 45,106 | 57,581 | 61,905 | |
| | Hogs and Pigs | 757 | 374 | 697 | 1,345 | |
| | Poultry and Eggs | 5,707 | 5,875 | 10,996 | 13,136 | |
| | Milk and Other Dairy Products | 349,163 | 342,440 | 330,344 | 504,884 | |
| | Aquaculture | n/a | 1,325 | 1,989 | 1,890 | |
| | Other (calculated) | 22,829 | 6,362 | 172,844 | 8,688 | |
| | Total | | 415,007 | 401,482 | 574,451 | 591,848 |
| Input Purchases | Livestock and poultry purchased | (Farms) | 1,911 | 1,660 | 1,541 | 2,205 |
| | | \$1,000 | 24,005 | 23,993 | 25,230 | 21,865 |
| | Breeding livestock purchased | (Farms) | n/a | 1,042 | 789 | 1,021 |
| | | \$1,000 | n/a | 14,949 | 16,178 | 13,916 |
| | Other livestock and poultry purchased | (Farms) | n/a | 803 | 970 | 1,536 |
| | | \$1,000 | n/a | 9,045 | 9,052 | 7,950 |
| | Feed purchased | (Farms) | 3,498 | 3,978 | 3,637 | 4,535 |
| | | \$1,000 | 119,251 | 108,693 | 144,129 | 210,804 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 183,599 | \$ 29,705 | 1,133 | \$ 8,059 |
| | Hogs, Pigs, and Other | \$ 1,815 | \$ 305 | 13 | \$ 83 |
| | Poultry and Eggs | \$ 191,447 | \$ 30,772 | 1,108 | \$ 8,348 |
| | Dairy | \$ 1,259,181 | \$ 218,769 | 8,979 | \$ 59,352 |
| | Total | \$ 1,636,043 | \$ 279,551 | 11,233 | \$ 75,842 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 87,486 | \$ 14,154 | 540 | \$ 3,840 |
| | Hogs, Pigs, and Other | \$ 977 | \$ 164 | 7 | \$ 45 |
| | Poultry and Eggs | \$ 66,771 | \$ 10,732 | 386 | \$ 2,912 |
| | Dairy | \$ 241,582 | \$ 41,972 | 1,723 | \$ 11,387 |
| | Total | \$ 396,815 | \$ 67,023 | 2,656 | \$ 18,183 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.9791 | \$ 0.3202 | 12.2 | |
| | Hogs, Pigs, and Other | \$ 1.6098 | \$ 0.2706 | 11.2 | |
| | Poultry and Eggs | \$ 1.8310 | \$ 0.2943 | 10.6 | |
| | Dairy | \$ 1.8522 | \$ 0.3218 | 13.2 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 6.8% | |
| | Total | | | 27.1% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: VIRGINIA

Virginia Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Virginia's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Virginia. The success of Virginia animal agriculture in turn has an impact on the rest of the state and regional economies. For example, in the state of Virginia during 2014 animal agriculture contributed:

- \$5.1 billion in economic output
- 23,748 jobs
- \$847.3 million in earnings
- \$221.0 million in income taxes paid at local, state, and federal levels
- \$110.2 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Virginia increased economic output by over \$1.1 billion, boosted household earnings by \$184.2 million, contributed 5,154 additional jobs and paid \$48.0 million in additional tax revenues.

Virginia's animal agriculture consumed about 515.7 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (303.9 thousand tons)
- Turkeys (142.4 thousand tons)
- Dairy Cows (25.8 thousand tons)

This report examines animal agriculture in Virginia over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Virginia, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a contributor to the economic well-being of the people of Virginia and beyond.

Virginia Economic Impact of Animal Agriculture

Animal agriculture is an important part of Virginia's economy. In 2014, Virginia's animal agriculture contributed the following to the economy:

- About \$5.1 billion in economic output
- \$847.3 million in household earnings
- 23,748 jobs
- \$221.0 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Virginia's animal agriculture has:

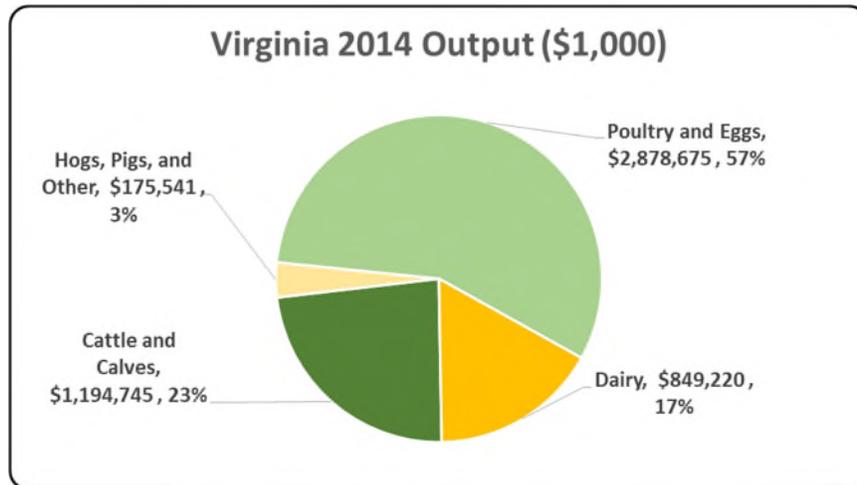
- Increased economic output by \$1.1 billion
- Boosted household earnings by \$184.2 million
- Added 5,154 jobs
- Paid an additional \$48.0 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 5,098,181 | \$ 1,113,841 | 27.96% |
| Earnings (\$1,000) | \$ 847,279 | \$ 184,169 | 27.77% |
| Employment (Jobs) | 23,748 | 5,154 | 27.72% |
| Income Taxes Paid (\$1,000) | \$ 220,970 | \$ 48,031 | 27.77% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 110,161 | | |

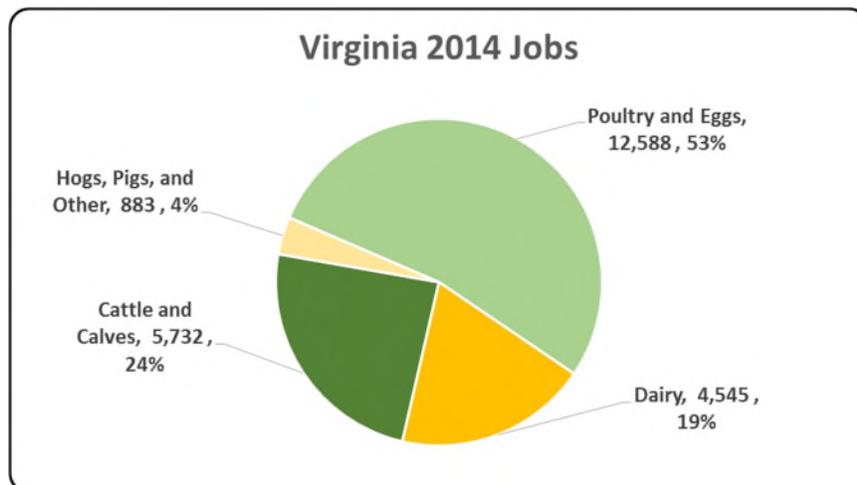
Virginia Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Virginia economy. Animal agriculture’s impact on Virginia total economic output is about \$5.1 billion.



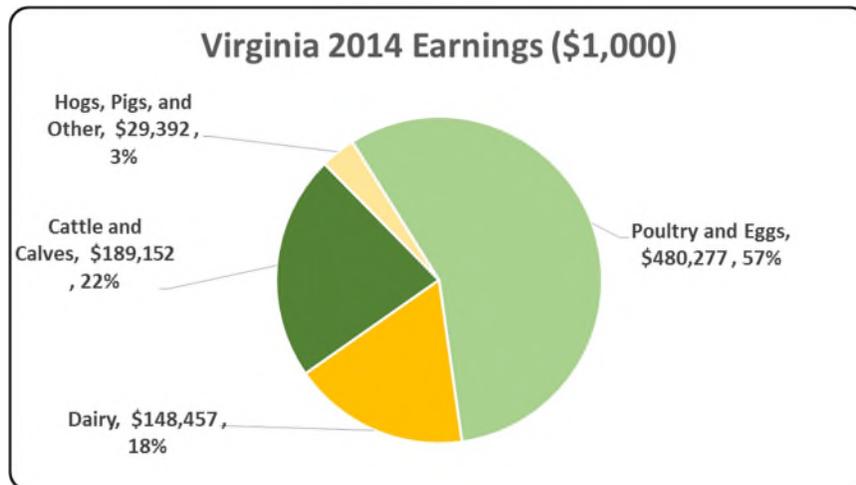
Virginia Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Virginia in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Virginia total jobs, contributing 23,748 jobs within and outside of animal agriculture.



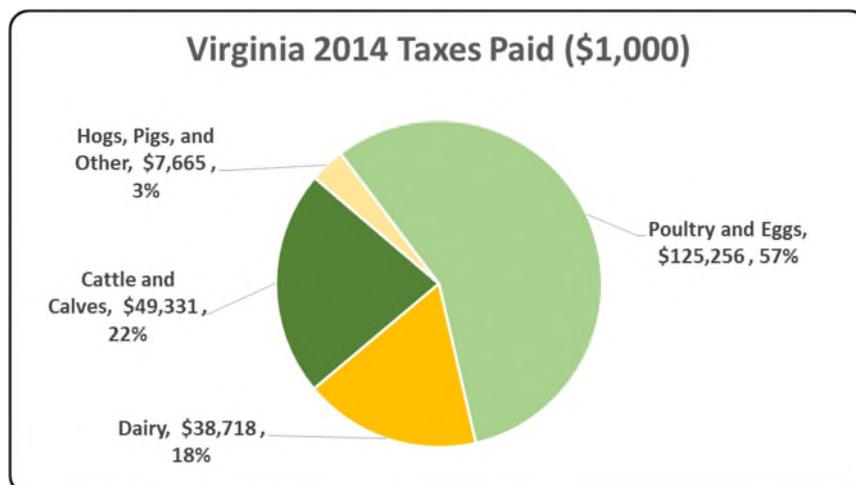
Virginia Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Virginia economy in terms of earnings. Virginia's animal agriculture contributed about \$847.3 million to household earnings in 2014.



Virginia Taxes Paid by Animal Agriculture

Virginia's animal agriculture is also a source of tax revenue. In 2014, the state's animal agriculture industry paid about \$221.0 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$110.2 million in property taxes paid by all of Virginia agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



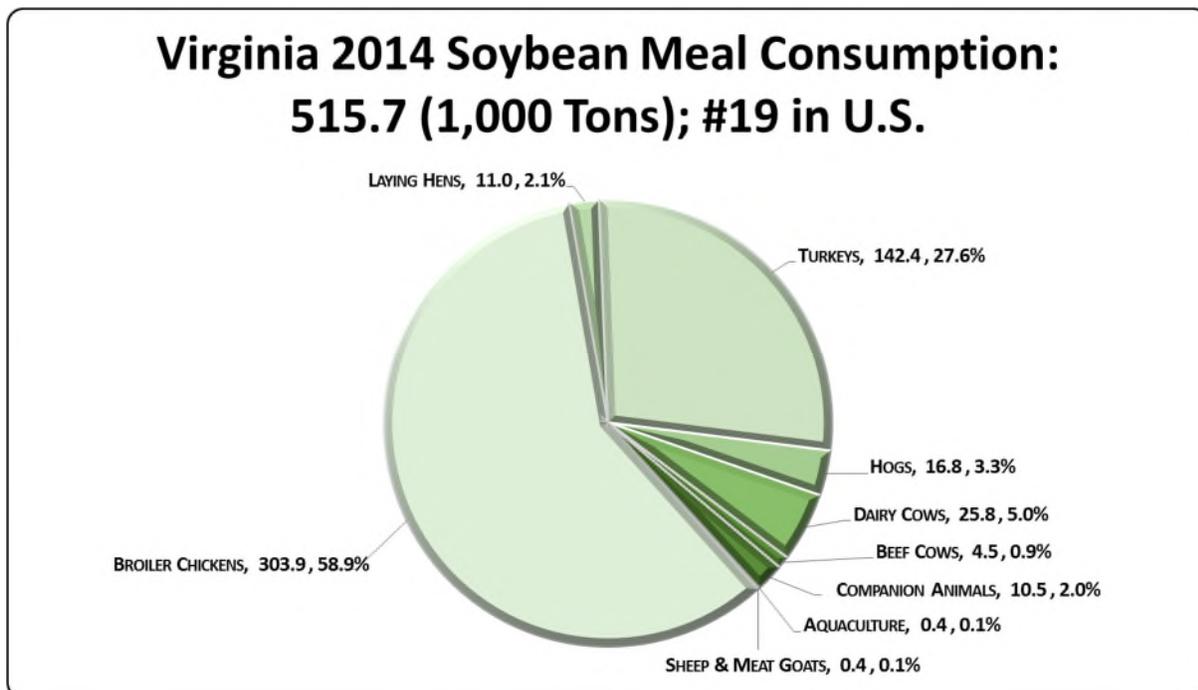
Virginia Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Virginia's animal agriculture consumed almost 515.7 thousand tons of soybean meal in 2014, placing the state as #19 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (303.9 thousand tons)
- Turkeys (142.4 thousand tons)
- Dairy Cows (25.8 thousand tons)

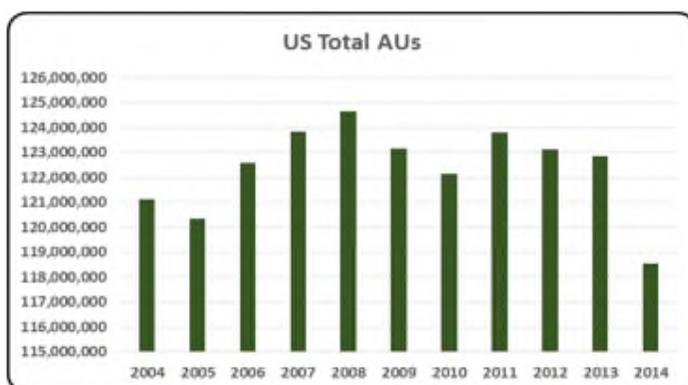


Virginia Animal Unit (AU) Trends

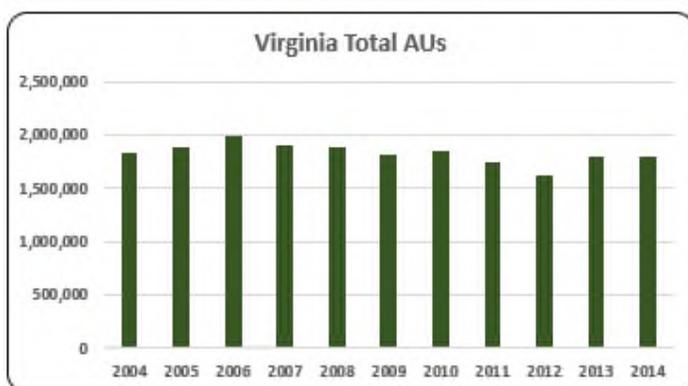
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Virginia. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Virginia and to give perspective on Virginia's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

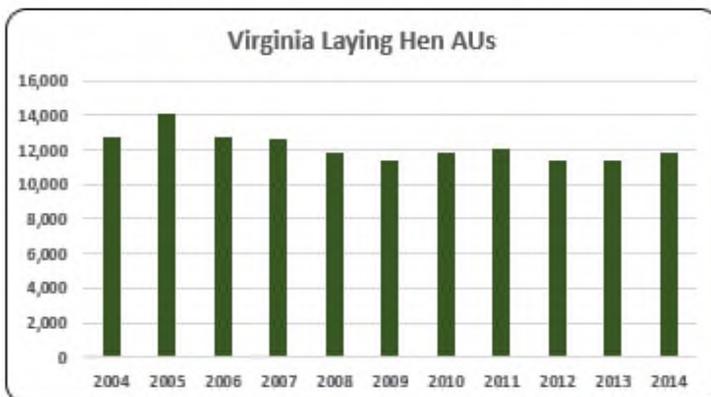
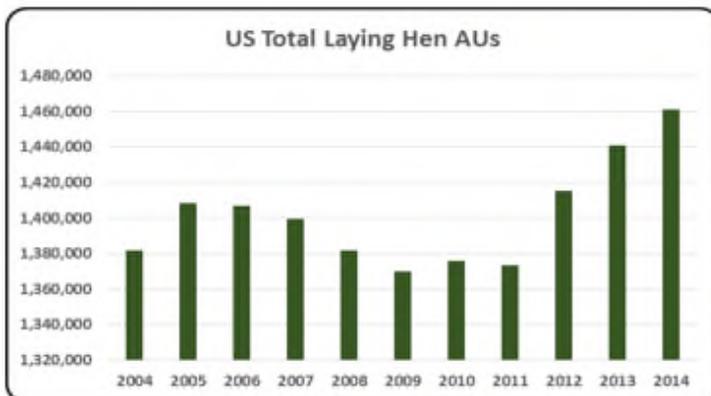
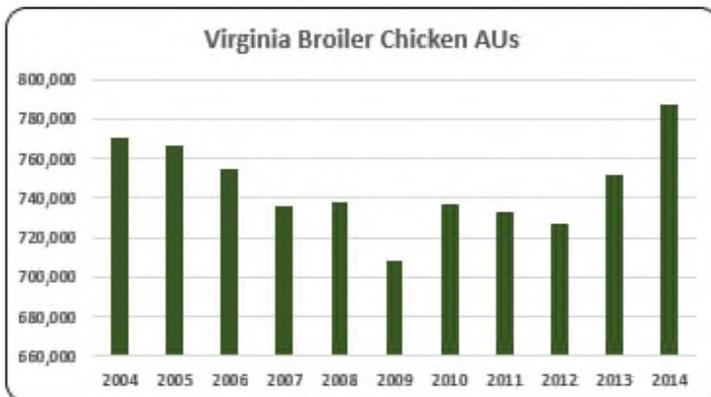
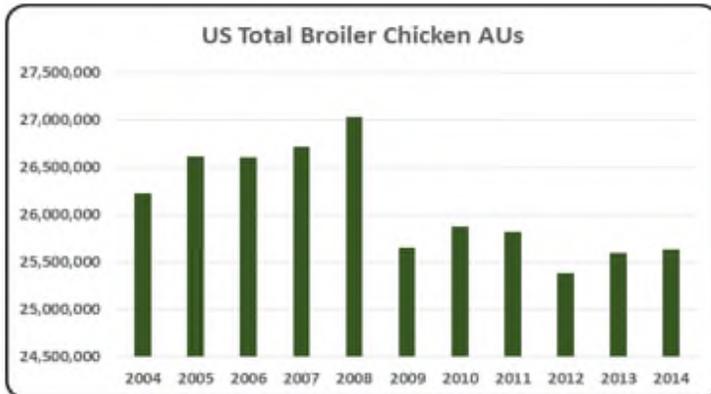
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Virginia, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (787.4 thousand AUs), Beef Cows (559.2 thousand AUs), and Turkeys (251.9 thousand AUs). Total animal units in Virginia during 2014 were 1,789.1 thousand AUs.



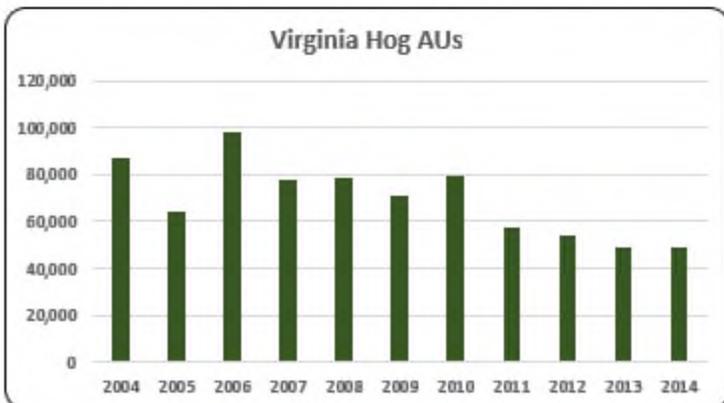
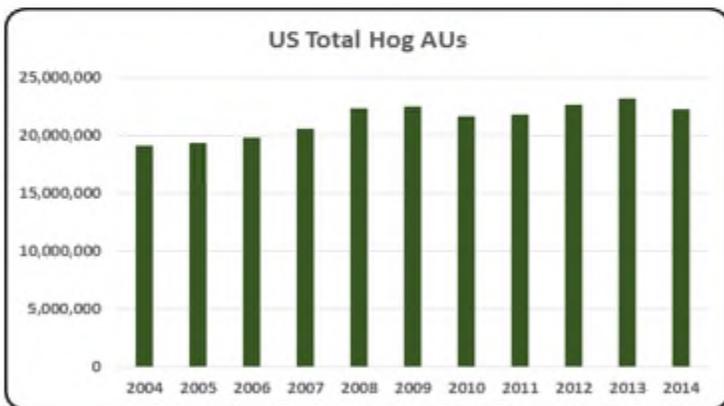
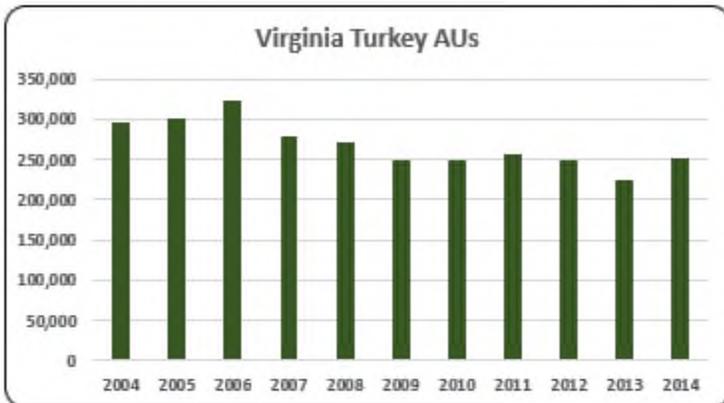
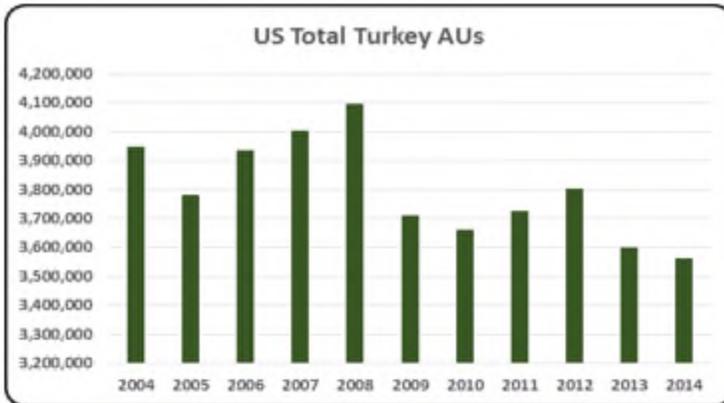
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



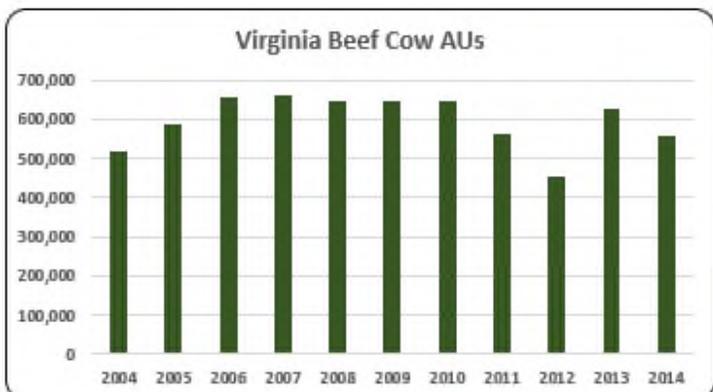
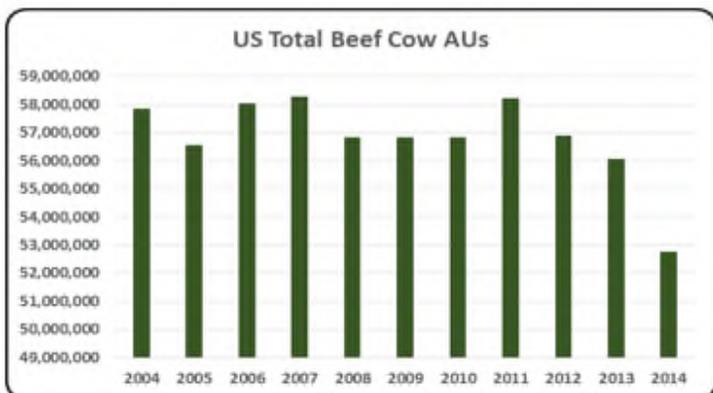
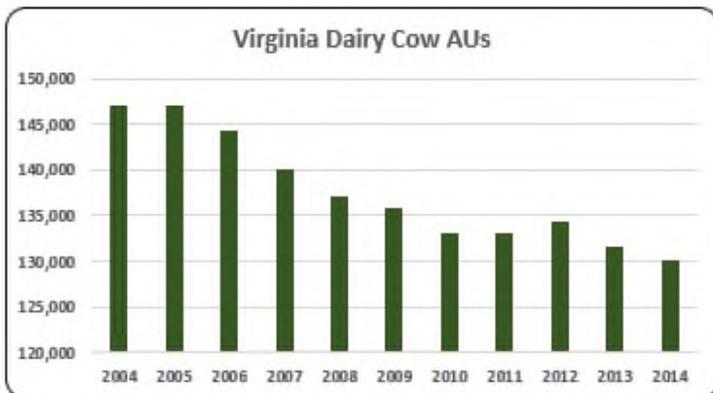
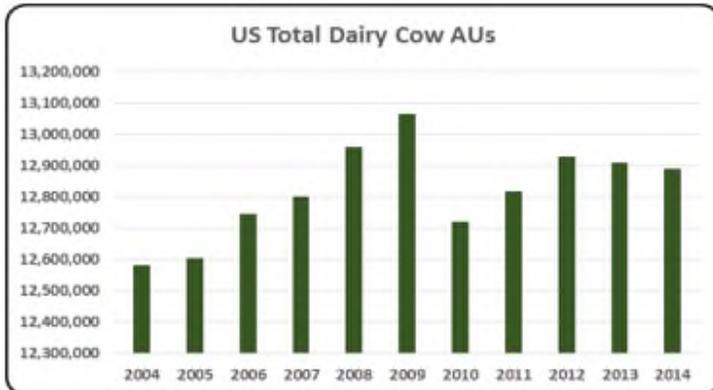
- Virginia animal production in 2014 was 1,789.1 thousand AUs which was 2.3% less than in 2004 (1,830.5 thousand AUs).



- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- Broiler production was the largest animal production in Virginia. In 2014, 44% (787,450 broiler AUs) of all AUs were concentrated in broiler production. Broiler production in 2014 was record high increasing 4.8% year-over-year.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Less than 1% (0.66%, 11,785 layer AUs) of all AUs in Virginia were in layer production in 2014. Layer production in 2014 dropped 7.5% relative to 2004 (12,740 layer AUs).



- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- There were 268,235 turkey AUs, on average, between 2004 and 2014. 2014 turkey production (251,919 turkey AUs) shrank 14.7% compared to 2004 turkey production (295,500 turkey AUs).
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production decreased 44.1% between 2004 (86,850 hog AUs) and 2014 (48,525 hog AUs).



- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.
- There were 137,582 dairy cow AUs, on average, from 2004 to 2014. Dairy cow production dropped 11.4% from 2004 to 2014.
- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.
- Beef cow production was the largest animal production in Virginia between 2004 and 2014. Thirty one percent of all animal production was concentrated in beef cows in 2014 (559,200 beef cow AUs).

Virginia Additional Information and Methodology

Animal agriculture is an important part of Virginia's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Virginia, of interest is the degree to which the industry impacts the Virginia economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Virginia animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Virginia's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Virginia which have occurred. As shown in this state report, Virginia has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Virginia. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Virginia Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Virginia's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Virginia, \$1.578 to \$2.119 million in total economic activity, \$0.264 to \$0.354 in household wages and 8 to 9 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.7572 | \$ 0.2782 | 8.4 |
| | Hogs, Pigs, and Other | \$ 1.5779 | \$ 0.2642 | 7.9 |
| | Poultry and Eggs | \$ 2.1194 | \$ 0.3536 | 9.3 |
| | Dairy | \$ 1.7670 | \$ 0.3089 | 9.5 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 518,400 | 585,300 | 655,500 | 661,350 | 644,400 | 644,400 | 644,400 | 561,000 | 451,200 | 625,950 | 559,200 |
| | Hog and Pig AUs | 86,850 | 64,350 | 98,400 | 77,550 | 78,300 | 71,250 | 79,500 | 57,300 | 54,450 | 48,900 | 48,525 |
| | Broiler AUs | 769,973 | 766,974 | 754,697 | 735,854 | 738,032 | 708,532 | 736,879 | 732,504 | 727,400 | 751,713 | 787,450 |
| | Turkey AUs | 295,500 | 301,584 | 324,277 | 279,336 | 271,748 | 249,104 | 248,687 | 255,619 | 248,332 | 224,485 | 251,919 |
| | Egg Layer AUs | 12,740 | 14,120 | 12,736 | 12,652 | 11,832 | 11,428 | 11,804 | 12,088 | 11,346 | 11,398 | 11,785 |
| | Dairy AUs | 147,000 | 147,000 | 144,200 | 140,000 | 137,200 | 135,800 | 133,000 | 133,000 | 134,400 | 131,600 | 130,200 |
| | Total Animal Units | 1,830,463 | 1,879,328 | 1,989,810 | 1,906,741 | 1,881,512 | 1,820,514 | 1,854,270 | 1,751,511 | 1,627,128 | 1,794,045 | 1,789,079 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 385,641 | \$ 432,434 | \$ 394,723 | \$ 405,442 | \$ 340,907 | \$ 343,919 | \$ 364,945 | \$ 432,521 | \$ 515,665 | \$ 483,683 | \$ 679,914 |
| | Hogs and Pigs (\$1,000) | \$ 63,792 | \$ 55,390 | \$ 62,215 | \$ 58,155 | \$ 57,464 | \$ 48,814 | \$ 60,325 | \$ 48,919 | \$ 40,495 | \$ 44,822 | \$ 46,300 |
| | Broilers (\$1,000) | \$ 590,172 | \$ 570,825 | \$ 479,592 | \$ 559,430 | \$ 575,690 | \$ 550,228 | \$ 622,792 | \$ 593,074 | \$ 653,400 | \$ 819,754 | \$ 917,917 |
| | Turkeys (\$1,000) | \$ 182,855 | \$ 230,920 | \$ 260,709 | \$ 251,082 | \$ 271,152 | \$ 215,424 | \$ 278,256 | \$ 313,891 | \$ 318,682 | \$ 267,995 | \$ 325,987 |
| | Eggs (\$1,000) | \$ 69,703 | \$ 67,421 | \$ 66,769 | \$ 78,991 | \$ 77,103 | \$ 66,223 | \$ 77,640 | \$ 88,362 | \$ 91,531 | \$ 99,390 | \$ 114,346 |
| | Milk (\$1,000) | \$ 309,849 | \$ 294,360 | \$ 267,421 | \$ 373,389 | \$ 372,816 | \$ 265,608 | \$ 333,486 | \$ 397,089 | \$ 359,216 | \$ 398,918 | \$ 480,600 |
| | Other | \$ 42,686 | \$ 44,541 | \$ 46,425 | \$ 48,771 | \$ 51,196 | \$ 53,699 | \$ 56,165 | \$ 58,144 | \$ 60,412 | \$ 62,681 | \$ 64,950 |
| | Sheep and Lambs (\$1,000) | \$ 3,587 | \$ 3,602 | \$ 3,646 | \$ 4,152 | \$ 4,737 | \$ 5,400 | \$ 6,027 | \$ 6,165 | \$ 6,594 | \$ 7,023 | \$ 7,452 |
| | Aquaculture (\$1,000) | \$ 39,099 | \$ 40,939 | \$ 42,779 | \$ 44,619 | \$ 46,459 | \$ 48,299 | \$ 50,138 | \$ 51,978 | \$ 53,818 | \$ 55,658 | \$ 57,498 |
| | Total (\$1,000) | \$ 1,644,698 | \$ 1,695,891 | \$ 1,577,854 | \$ 1,775,260 | \$ 1,746,328 | \$ 1,543,915 | \$ 1,793,609 | \$ 1,932,000 | \$ 2,039,401 | \$ 2,177,243 | \$ 2,630,014 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|---------|-----------|-----------|-----------|-----------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 20,369 | 20,967 | 20,923 | 18,149 | |
| | Cattle feedlots (112112) | 788 | 1,618 | 778 | 373 | |
| | Dairy cattle and milk production (11212) | 1,152 | 1,109 | 934 | 691 | |
| | Hog and pig farming (1122) | 254 | 202 | 375 | 323 | |
| | Poultry and egg production (1123) | 1,252 | 1,392 | 1,798 | 1,668 | |
| | Sheep and goat farming (1124) | 588 | 912 | 1,512 | 1,564 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,513 | 5,391 | 5,973 | 6,217 | |
| Value of Sales (\$1,000) | Cattle and Calves | 412,012 | 471,703 | 574,506 | 707,976 | |
| | Hogs and Pigs | 78,077 | 72,213 | 56,960 | 67,702 | |
| | Poultry and Eggs | 761,380 | 750,035 | 971,851 | 1,161,564 | |
| | Milk and Other Dairy Products | 277,119 | 275,402 | 330,344 | 347,204 | |
| | Aquaculture | 24,629 | 19,945 | 53,032 | 54,665 | |
| | Other (calculated) | n/a | 6,782 | 61,194 | 22,023 | |
| | Total | | 1,553,217 | 1,596,080 | 2,047,887 | 2,361,134 |
| Input Purchases | Livestock and poultry purchased | (Farms) | 12,700 | 13,434 | 11,487 | 13,722 |
| | | \$1,000 | 208,871 | 277,272 | 323,214 | 424,722 |
| | Breeding livestock purchased | (Farms) | n/a | 6,974 | 6,167 | 7,395 |
| | | \$1,000 | n/a | 27,806 | 38,777 | 57,220 |
| | Other livestock and poultry purchased | (Farms) | n/a | 8,182 | 6,815 | 8,369 |
| | | \$1,000 | n/a | 249,466 | 284,437 | 367,502 |
| Feed purchased | (Farms) | 23,331 | 31,374 | 29,233 | 32,768 | |
| | \$1,000 | 649,741 | 507,692 | 727,195 | 1,067,299 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,194,745 | \$ 189,152 | 5,732 | \$ 49,331 |
| | Hogs, Pigs, and Other | \$ 175,541 | \$ 29,392 | 883 | \$ 7,665 |
| | Poultry and Eggs | \$ 2,878,675 | \$ 480,277 | 12,588 | \$ 125,256 |
| | Dairy | \$ 849,220 | \$ 148,457 | 4,545 | \$ 38,718 |
| | Total | \$ 5,098,181 | \$ 847,279 | 23,748 | \$ 220,970 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 345,493 | \$ 54,698 | 1,658 | \$ 14,265 |
| | Hogs, Pigs, and Other | \$ (35,017) | \$ (5,863) | (176) | \$ (1,529) |
| | Poultry and Eggs | \$ 640,295 | \$ 106,827 | 2,800 | \$ 27,860 |
| | Dairy | \$ 163,070 | \$ 28,507 | 873 | \$ 7,435 |
| | Total | \$ 1,113,841 | \$ 184,169 | 5,154 | \$ 48,031 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 1.7572 | \$ 0.2782 | 8.4 | |
| | Hogs, Pigs, and Other | \$ 1.5779 | \$ 0.2642 | 7.9 | |
| | Poultry and Eggs | \$ 2.1194 | \$ 0.3536 | 9.3 | |
| | Dairy | \$ 1.7670 | \$ 0.3089 | 9.5 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 5.8% |
| | Total | | | | 26.1% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: WASHINGTON

Washington Executive Summary

The use of soybean meal as a key feed ingredient is a modest part of Washington's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in Washington. The success of Washington animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Washington during 2014 animal agriculture contributed:

- \$6.7 billion in economic output
- 32,469 jobs
- \$1.2 billion in earnings
- \$245.8 million in income taxes paid at local, state, and federal levels
- \$175.1 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Washington increased economic output by over \$2.2 billion, boosted household earnings by \$401.0 million, contributed 10,757 additional jobs and paid \$81.5 million in additional tax revenues.

Washington's animal agriculture consumed about 222.6 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (108.9 thousand tons)
- Egg-Laying Hens (44.1 thousand tons)
- Dairy Cows (34.5 thousand tons)

This report examines animal agriculture in Washington over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Washington, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Washington and beyond.

Washington Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Washington's economy. In 2014, Washington's animal agriculture contributed the following to the economy:

- About \$6.7 billion in economic output
- \$1.2 billion in household earnings
- 32,469 jobs
- \$245.8 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Washington's animal agriculture has:

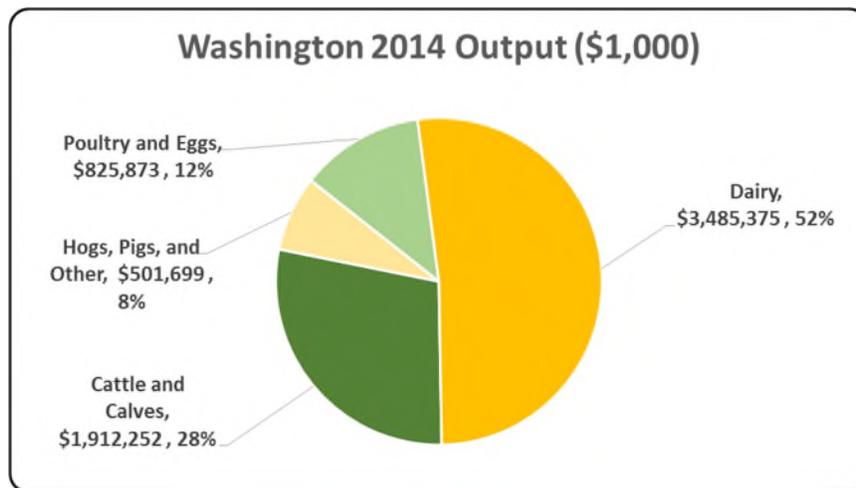
- Increased economic output by \$2.2 billion
- Boosted household earnings by \$401.0 million
- Added 10,757 jobs
- Paid an additional \$81.5 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 6,725,199 | \$ 2,225,287 | 49.45% |
| Earnings (\$1,000) | \$ 1,208,927 | \$ 400,953 | 49.62% |
| Employment (Jobs) | 32,469 | 10,757 | 49.54% |
| Income Taxes Paid (\$1,000) | \$ 245,775 | \$ 81,514 | 49.62% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 175,113 | | |

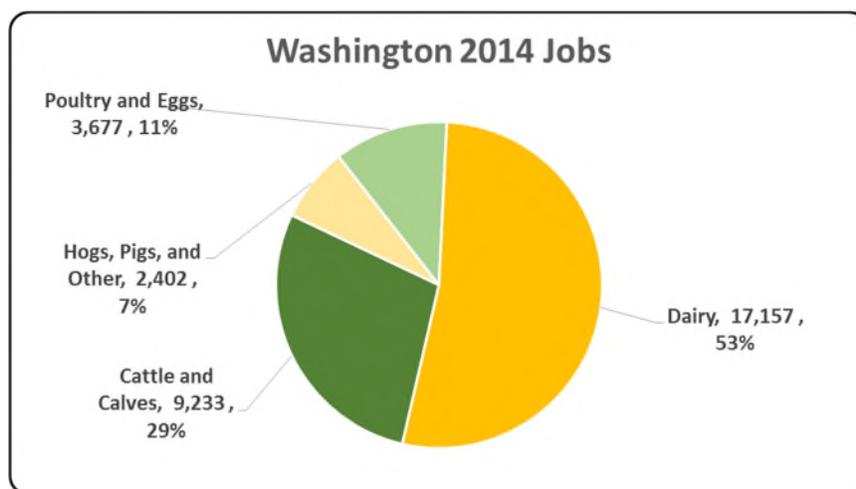
Washington Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Washington economy. Animal agriculture’s impact on Washington total economic output is about \$6.7 billion.



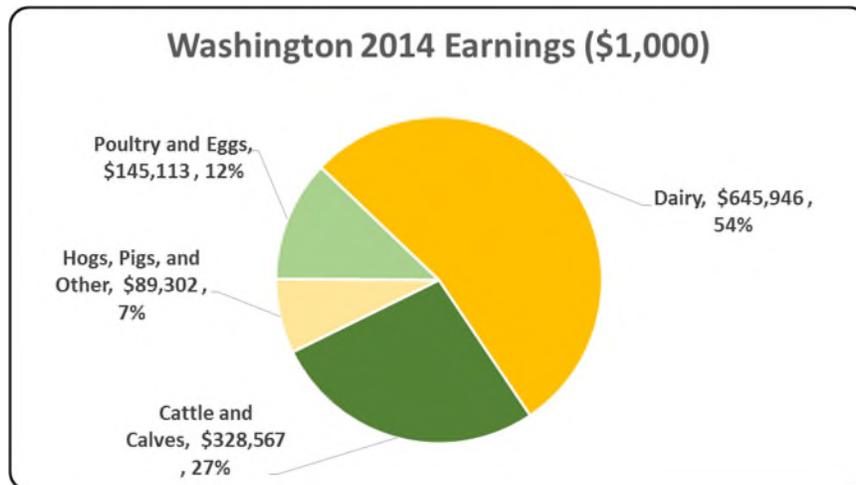
Washington Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Washington in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Washington total jobs, contributing 32,469 jobs within and outside of animal agriculture.



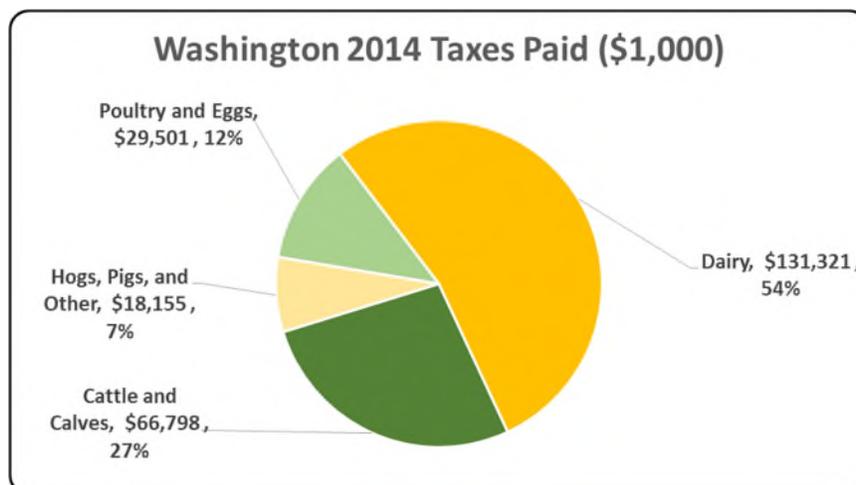
Washington Earnings

Earnings includes wages and salaries plus proprietors’ income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Washington economy in terms of earnings. Washington’s animal agriculture contributed about \$1.2 billion to household earnings in 2014.



Washington Taxes Paid by Animal Agriculture

Washington’s animal agriculture is also a significant source of tax revenue. In 2014, the state’s animal agriculture industry paid about \$245.8 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$175.1 million in property taxes paid by all of Washington agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



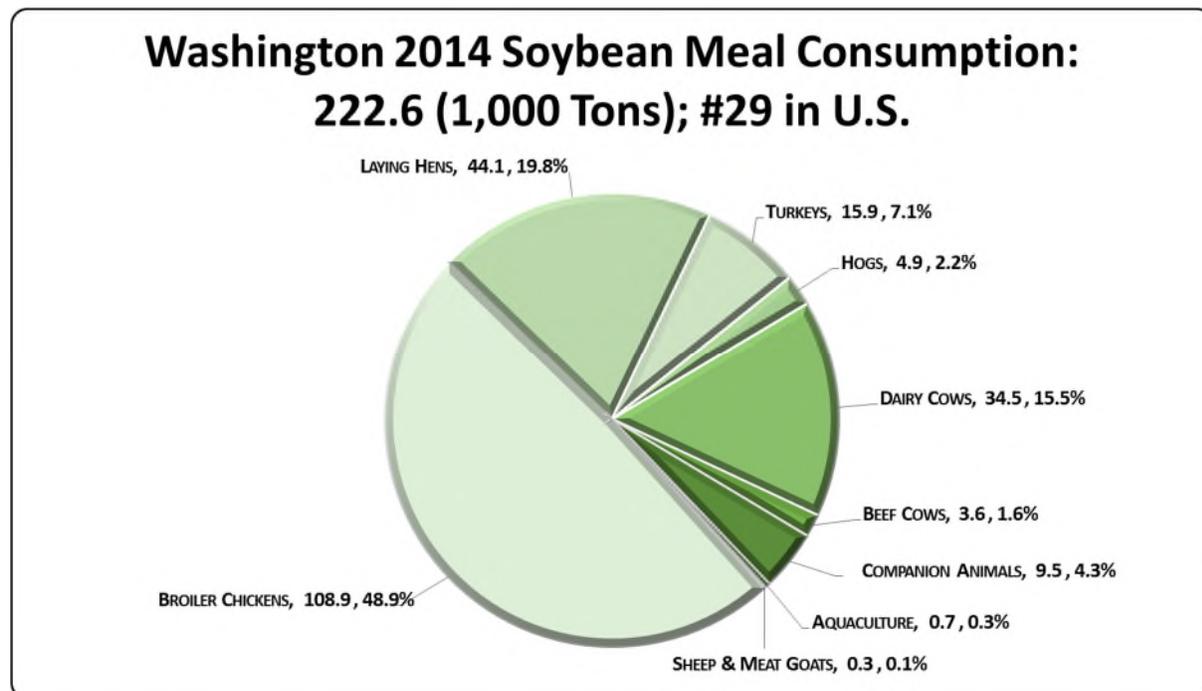
Washington Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Washington's animal agriculture consumed almost 222.6 thousand tons of soybean meal in 2014, placing the state as #29 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (108.9 thousand tons)
- Egg-Laying Hens (44.1 thousand tons)
- Dairy Cows (34.5 thousand tons)

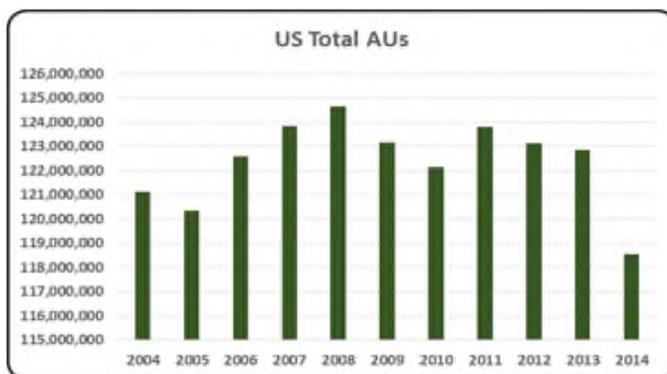


Washington Animal Unit (AU) Trends

Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Washington. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Washington and to give perspective on Washington's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

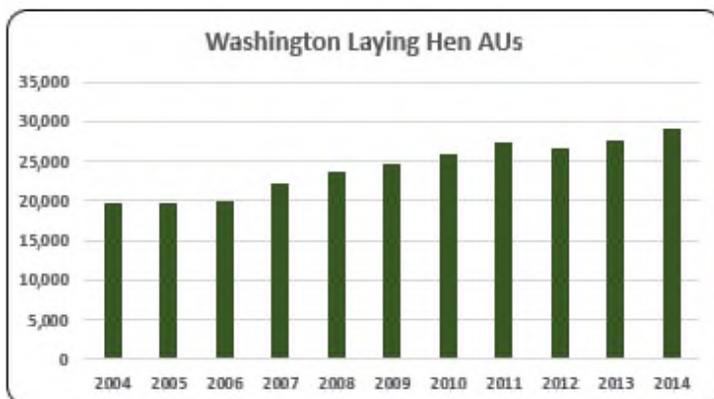
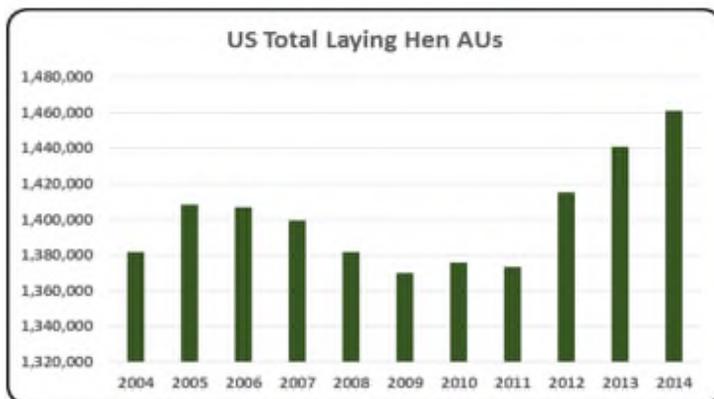
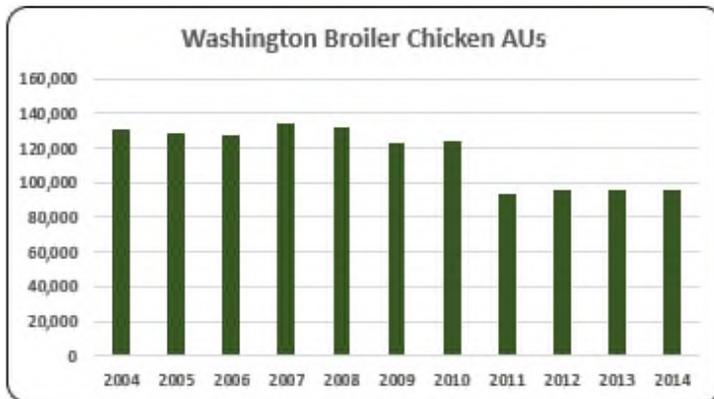
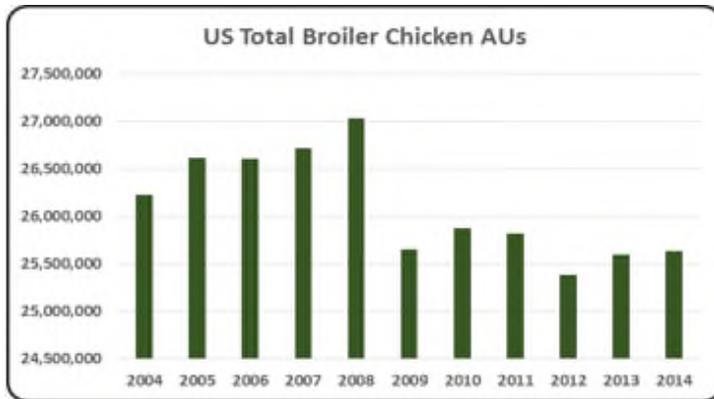
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Washington, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (586.5 thousand AUs), Dairy Cows (372.4 thousand AUs), and Broilers (95.3 thousand AUs). Total animal units in Washington during 2014 were 1,121.7 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- The state of Washington held less than 1.0% (1,121.7 thousand AUs) of all AUs in the country. Animal production in 2014 declined 5.4% compared to the previous year.

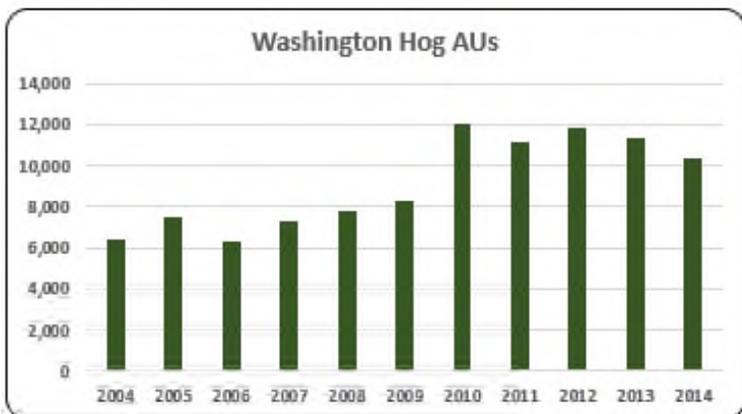
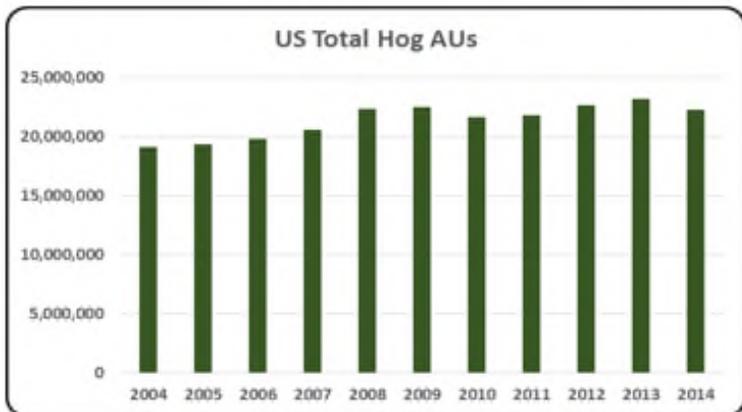
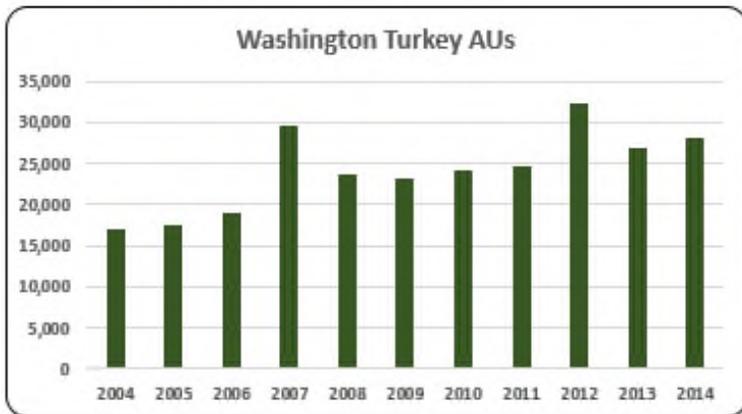
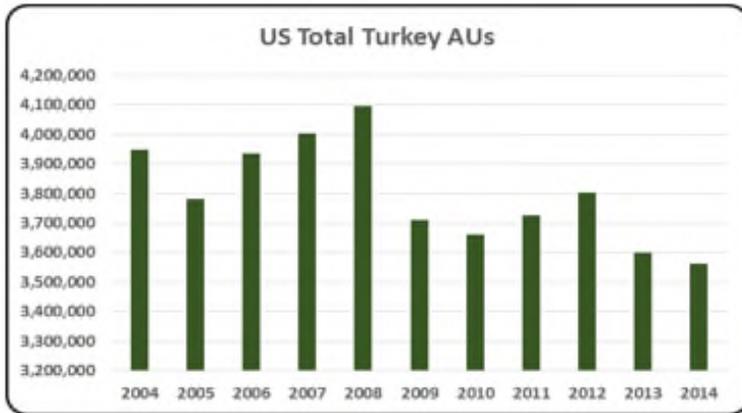


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

- Broiler production in 2014 (95,258 broiler AUs) went 27.1% below 2004 levels (130,679 broiler AUs). Broiler production from 2011 to 2014 averaged 95,164 broiler AUs compared to 128,206 broiler AUs between 2004-2010 years.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

- Washington’s layer production in 2014 was 29,094 layer AUs, expanding 48.5% compared to the layer production in 2004 (19,588 layer AUs).

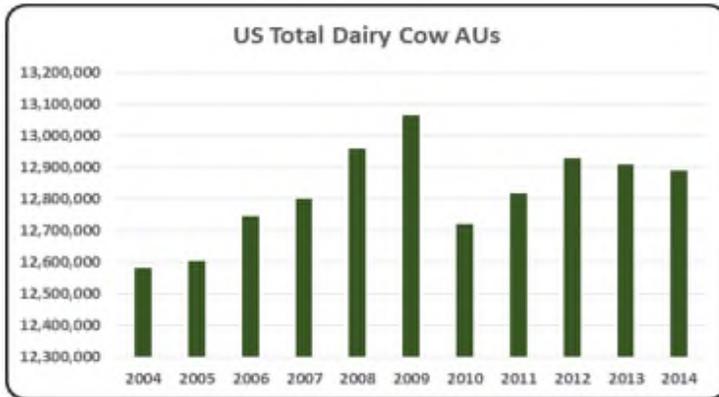


- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

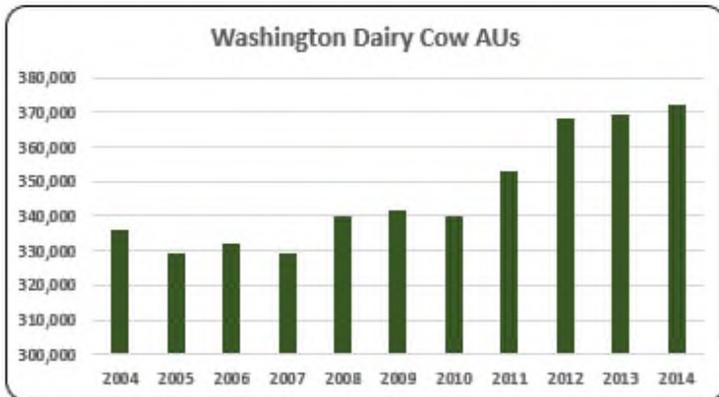
- Turkey AUs made up only 2.51% (28,143 turkey AUs) of the Washington total in 2014. There has been, on average, 24,192 during last decade.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

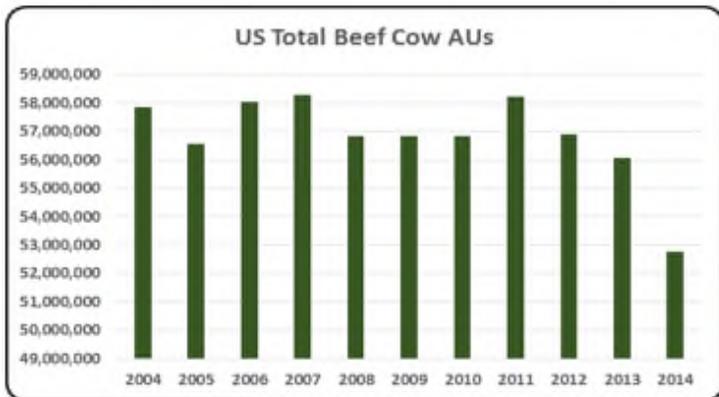
- Less than 1.0% (10,353 hog AUs) of animal production was from hog production in Washington in 2014. Hog production in 2014 was 60.5% higher than production in 2004 (6,450 hog AUs).



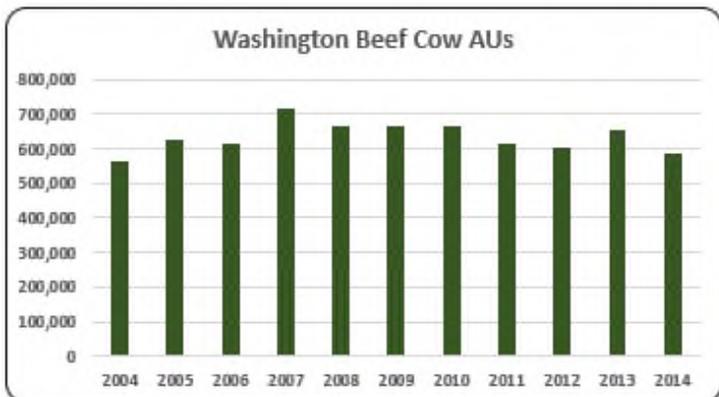
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Dairy cow production was the second largest animal production in Washington during last decade. There were 372,400 dairy cow AUs in 2014 representing about 33.20% of all animal production in Washington.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production was the number one animal production in the state of Washington from 2004 to 2014. In 2014, 52.3% (586,500 beef cow AUs) of all AUs were concentrated in beef cow production.

Washington Additional Information and Methodology

Animal agriculture is an important part of Washington's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Washington, of interest is the degree to which the industry impacts the Washington economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Washington animal agriculture are presented in this report.

Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Washington's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Washington which have occurred. As shown in this state report, Washington has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Washington. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Washington Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Washington's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Washington, \$1.852 to \$2.354 million in total economic activity, \$0.330 to \$0.414 in household wages and 9 to 11 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.3309 | \$ 0.4005 | 11.3 |
| | Hogs, Pigs, and Other | \$ 1.8517 | \$ 0.3296 | 8.9 |
| | Poultry and Eggs | \$ 2.3539 | \$ 0.4136 | 10.5 |
| | Dairy | \$ 2.1432 | \$ 0.3972 | 10.6 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 564,300 | 623,850 | 613,800 | 716,250 | 663,900 | 663,900 | 663,900 | 612,300 | 601,200 | 653,100 | 586,500 |
| | Hog and Pig AUs | 6,450 | 7,485 | 6,300 | 7,275 | 7,770 | 8,325 | 12,021 | 11,170 | 11,837 | 11,374 | 10,353 |
| | Broiler AUs | 130,679 | 127,929 | 127,065 | 133,717 | 131,632 | 122,387 | 124,033 | 93,460 | 96,138 | 95,802 | 95,258 |
| | Turkey AUs | 17,048 | 17,484 | 18,998 | 29,610 | 23,668 | 23,183 | 24,148 | 24,579 | 32,303 | 26,946 | 28,143 |
| | Egg Layer AUs | 19,588 | 19,728 | 19,892 | 22,240 | 23,728 | 24,692 | 25,972 | 27,312 | 26,591 | 27,665 | 29,094 |
| | Dairy AUs | 336,000 | 329,000 | 331,800 | 329,000 | 340,200 | 341,600 | 340,200 | 352,800 | 368,200 | 369,600 | 372,400 |
| | Total Animal Units | 1,074,065 | 1,125,476 | 1,117,855 | 1,238,092 | 1,190,898 | 1,184,087 | 1,190,274 | 1,121,620 | 1,136,268 | 1,184,487 | 1,121,748 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 476,099 | \$ 600,698 | \$ 583,955 | \$ 574,073 | \$ 494,443 | \$ 467,592 | \$ 566,958 | \$ 587,179 | \$ 658,787 | \$ 715,458 | \$ 820,392 |
| | Hogs and Pigs (\$1,000) | \$ 4,984 | \$ 6,198 | \$ 5,123 | \$ 5,329 | \$ 4,526 | \$ 4,377 | \$ 10,645 | \$ 13,390 | \$ 14,777 | \$ 13,526 | \$ 14,073 |
| | Broilers (\$1,000) | \$ 109,913 | \$ 104,114 | \$ 80,457 | \$ 100,593 | \$ 103,527 | \$ 89,676 | \$ 94,388 | \$ 83,161 | \$ 95,770 | \$ 116,672 | \$ 122,392 |
| | Turkeys (\$1,000) | \$ 15,818 | \$ 16,773 | \$ 19,823 | \$ 34,148 | \$ 31,967 | \$ 21,438 | \$ 28,721 | \$ 32,213 | \$ 46,849 | \$ 30,852 | \$ 51,656 |
| | Eggs (\$1,000) | \$ 77,348 | \$ 44,791 | \$ 56,661 | \$ 105,372 | \$ 136,448 | \$ 106,499 | \$ 120,732 | \$ 140,429 | \$ 137,149 | \$ 147,396 | \$ 176,805 |
| | Milk (\$1,000) | \$ 861,144 | \$ 835,592 | \$ 688,464 | \$ 1,061,952 | \$ 1,002,496 | \$ 684,003 | \$ 950,222 | \$ 1,276,983 | \$ 1,159,524 | \$ 1,298,880 | \$ 1,626,248 |
| | Other | \$ 79,949 | \$ 97,749 | \$ 114,519 | \$ 132,613 | \$ 149,880 | \$ 167,907 | \$ 186,840 | \$ 203,687 | \$ 221,413 | \$ 239,140 | \$ 256,867 |
| | Sheep and Lambs (\$1,000) | \$ 4,216 | \$ 4,546 | \$ 3,846 | \$ 4,469 | \$ 4,266 | \$ 4,822 | \$ 6,285 | \$ 5,661 | \$ 5,918 | \$ 6,174 | \$ 6,430 |
| | Aquaculture (\$1,000) | \$ 75,733 | \$ 93,203 | \$ 110,673 | \$ 128,144 | \$ 145,614 | \$ 163,085 | \$ 180,555 | \$ 198,025 | \$ 215,496 | \$ 232,966 | \$ 250,436 |
| | Total (\$1,000) | \$ 1,625,254 | \$ 1,705,914 | \$ 1,549,003 | \$ 2,014,080 | \$ 1,923,287 | \$ 1,541,492 | \$ 1,958,505 | \$ 2,337,041 | \$ 2,334,270 | \$ 2,561,924 | \$ 3,068,433 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 7,436 | 7,393 | 8,200 | 9,008 | |
| | Cattle feedlots (112112) | 656 | 1,004 | 498 | 116 | |
| | Dairy cattle and milk production (11212) | 893 | 845 | 626 | 471 | |
| | Hog and pig farming (1122) | 299 | 348 | 567 | 485 | |
| | Poultry and egg production (1123) | 287 | 455 | 1,231 | 1,016 | |
| | Sheep and goat farming (1124) | 588 | 1,060 | 1,556 | 1,407 | |
| | Animal aquaculture and other animal production (1125,1129) | 3,233 | 6,421 | 8,211 | 5,698 | |
| Value of Sales (\$1,000) | Cattle and Calves | 654,124 | 709,585 | 716,720 | 994,835 | |
| | Hogs and Pigs | 8,215 | 6,803 | 5,921 | 4,542 | |
| | Poultry and Eggs | 170,965 | 143,962 | 228,825 | 261,992 | |
| | Milk and Other Dairy Products | 624,839 | 634,908 | 873,365 | 1,136,856 | |
| | Aquaculture | n/a | 215,130 | 162,867 | 187,222 | |
| | Other (calculated) | 86,219 | 37,534 | 50,260 | 25,363 | |
| | Total | 1,544,362 | 1,747,922 | 2,037,958 | 2,610,810 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 6,743 | 7,365 | 8,589 | 9,641 | |
| | | \$1,000 | 353,157 | 394,109 | 326,256 | 424,941 |
| | Breeding livestock purchased | (Farms) n/a | 3,765 | 4,247 | 4,250 | |
| | | \$1,000 | n/a | 26,454 | 37,873 | 36,085 |
| | Other livestock and poultry purchased | (Farms) n/a | 4,690 | 5,553 | 6,686 | |
| | | \$1,000 | n/a | 367,655 | 288,383 | 388,856 |
| Feed purchased | (Farms) | 13,102 | 18,421 | 19,927 | 20,375 | |
| | \$1,000 | 495,975 | 471,553 | 663,387 | 1,106,416 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 1,912,252 | \$ 328,567 | 9,233 | \$ 66,798 |
| | Hogs, Pigs, and Other | \$ 501,699 | \$ 89,302 | 2,402 | \$ 18,155 |
| | Poultry and Eggs | \$ 825,873 | \$ 145,113 | 3,677 | \$ 29,501 |
| | Dairy | \$ 3,485,375 | \$ 645,946 | 17,157 | \$ 131,321 |
| | Total | \$ 6,725,199 | \$ 1,208,927 | 32,469 | \$ 245,775 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 521,488 | \$ 89,603 | 2,518 | \$ 18,216 |
| | Hogs, Pigs, and Other | \$ 304,603 | \$ 54,219 | 1,458 | \$ 11,023 |
| | Poultry and Eggs | \$ 226,795 | \$ 39,850 | 1,010 | \$ 8,101 |
| | Dairy | \$ 1,172,400 | \$ 217,281 | 5,771 | \$ 44,173 |
| | Total | \$ 2,225,287 | \$ 400,953 | 10,757 | \$ 81,514 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 2.3309 | \$ 0.4005 | 11.3 | |
| | Hogs, Pigs, and Other | \$ 1.8517 | \$ 0.3296 | 8.9 | |
| | Poultry and Eggs | \$ 2.3539 | \$ 0.4136 | 10.5 | |
| | Dairy | \$ 2.1432 | \$ 0.3972 | 10.6 | |
| Tax Rates | Federal effective income tax rate | | | 12.7% | |
| | Federal Social Security tax rate | | | 7.7% | |
| | State Effective Rate | | | 0.0% | |
| | Total | | | 20.3% | |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: WEST VIRGINIA

West Virginia Executive Summary

The use of soybean meal as a key feed ingredient is a modest part of West Virginia's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a driver of animal agriculture's success in West Virginia. The success of West Virginia animal agriculture in turn has an impact on the rest of the state and regional economies. For example, in the state of West Virginia during 2014 animal agriculture contributed:

- \$1.1 billion in economic output
- 4,939 jobs
- \$165.3 million in earnings
- \$43.5 million in income taxes paid at local, state, and federal levels
- \$21.0 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in West Virginia increased economic output by over \$337.3 million, boosted household earnings by \$52.0 million, contributed 1,571 additional jobs and paid \$13.7 million in additional tax revenues.

West Virginia's animal agriculture consumed about 154.1 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Broilers (112.5 thousand tons)
- Turkeys (26.3 thousand tons)
- Egg-Laying Hens (6.4 thousand tons)

This report examines animal agriculture in West Virginia over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in West Virginia, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a contributor to the economic well-being of the people of West Virginia and beyond.

West Virginia Economic Impact of Animal Agriculture

Animal agriculture is a modest part of West Virginia's economy. In 2014, West Virginia's animal agriculture contributed the following to the economy:

- About \$1.1 billion in economic output
- \$165.3 million in household earnings
- 4,939 jobs
- \$43.5 million in income taxes

And the animal agriculture sector has shown growth during challenging economic times. During the last decade West Virginia's animal agriculture has:

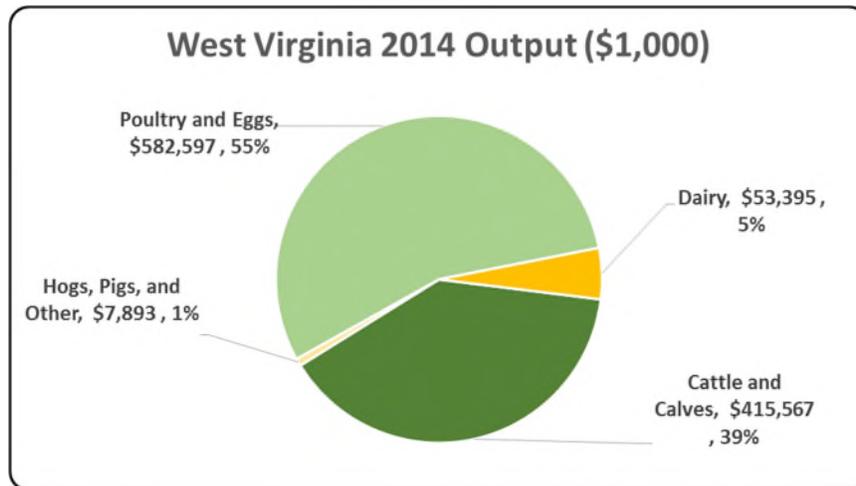
- Increased economic output by \$337.3 million
- Boosted household earnings by \$52.0 million
- Added 1,571 jobs
- Paid an additional \$13.7 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 1,059,452 | \$ 337,267 | 46.70% |
| Earnings (\$1,000) | \$ 165,329 | \$ 51,952 | 45.82% |
| Employment (Jobs) | 4,939 | 1,571 | 46.66% |
| Income Taxes Paid (\$1,000) | \$ 43,531 | \$ 13,679 | 45.82% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 21,036 | | |

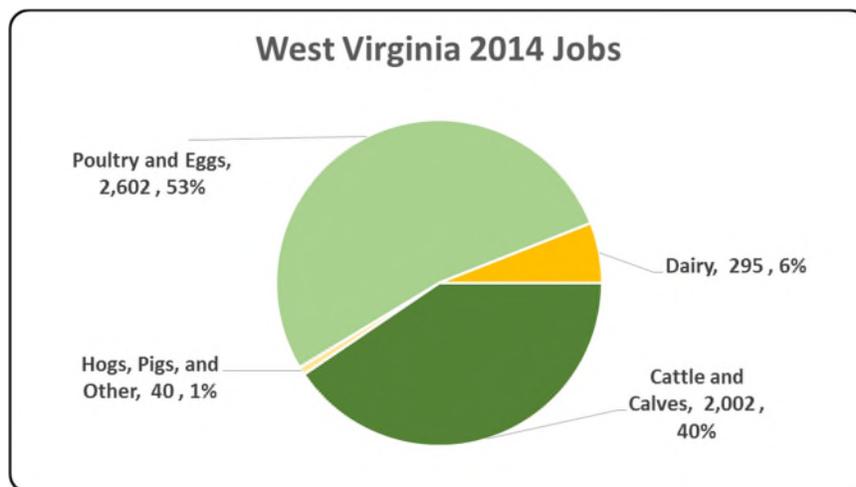
West Virginia Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the West Virginia economy. Animal agriculture’s impact on West Virginia total economic output is about \$1.1 billion.



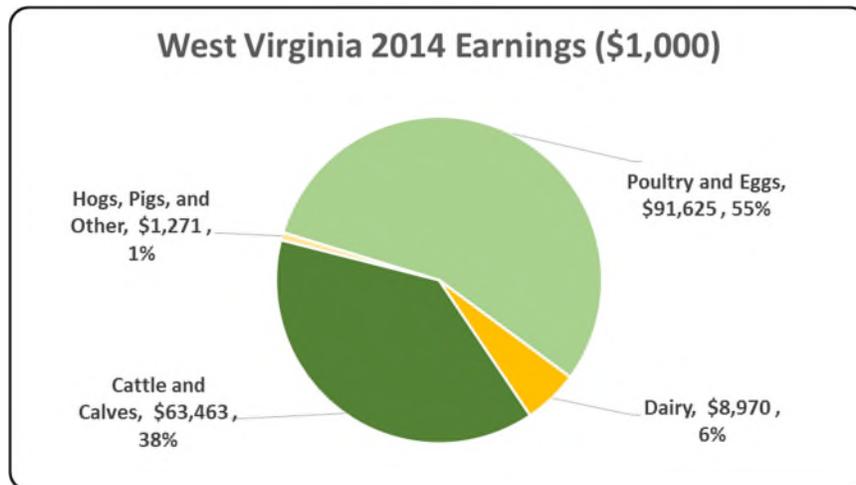
West Virginia Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to West Virginia in terms of animal agriculture jobs. As shown, animal agriculture contributes about 4,939 jobs within and outside of animal agriculture.



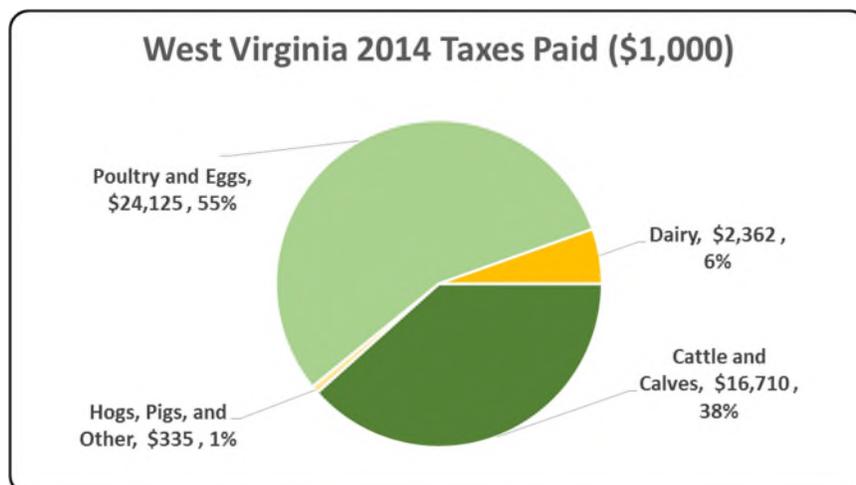
West Virginia Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the West Virginia economy in terms of earnings. West Virginia's animal agriculture contributed about \$165.3 million to household earnings in 2014.



West Virginia Taxes Paid by Animal Agriculture

West Virginia's animal agriculture is also a source of tax revenue. In 2014, the state's animal agriculture industry paid about \$43.5 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$21.0 million in property taxes paid by all of West Virginia agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



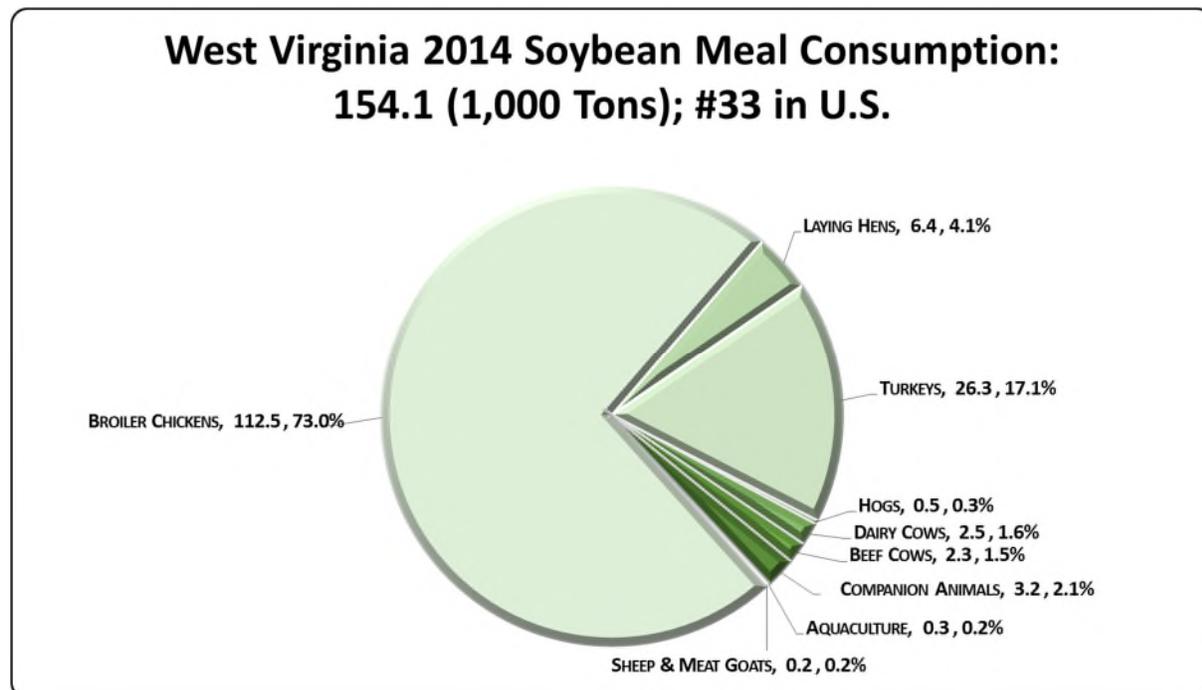
West Virginia Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

West Virginia's animal agriculture consumed almost 154.1 thousand tons of soybean meal in 2014, placing the state as #33 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Broilers (112.5 thousand tons)
- Turkeys (26.3 thousand tons)
- Egg-Laying Hens (6.4 thousand tons)

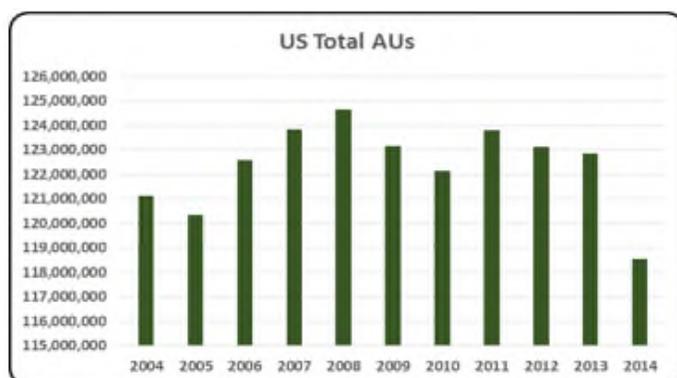


West Virginia Animal Unit (AU) Trends

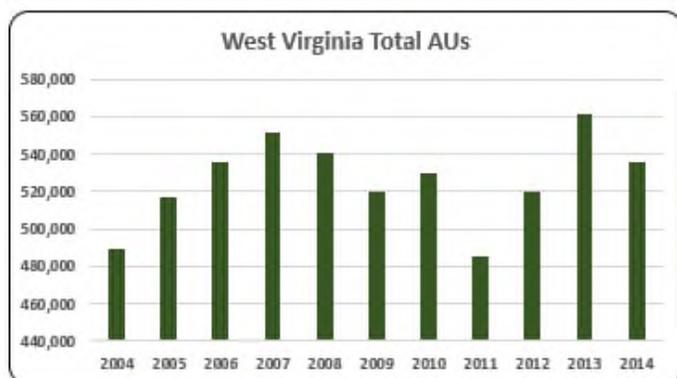
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of West Virginia. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to West Virginia and to give perspective on West Virginia's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

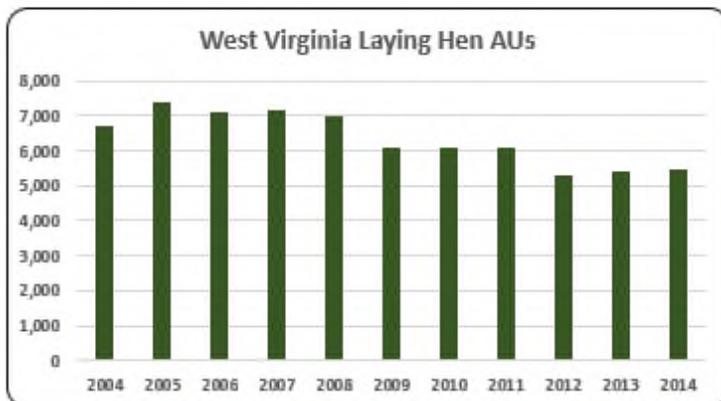
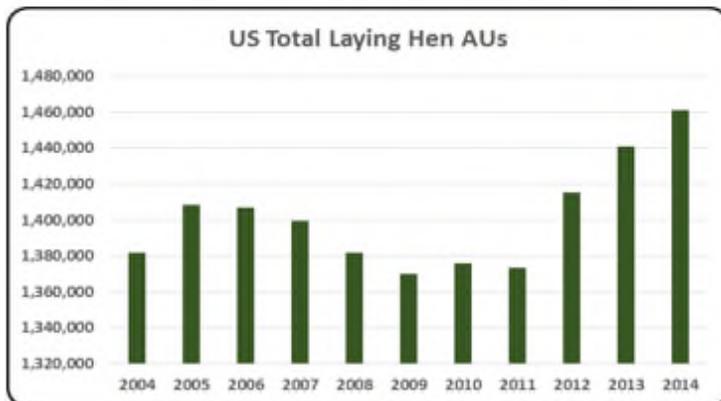
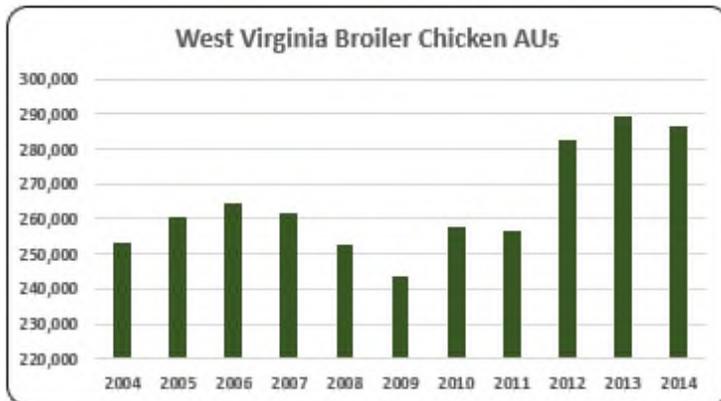
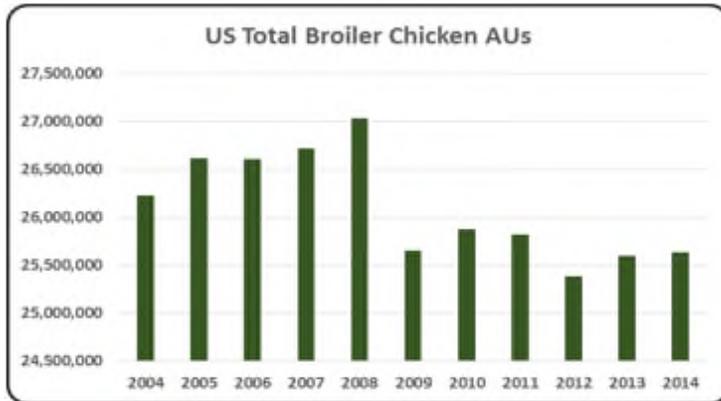
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In West Virginia, the largest three segments of animal agriculture in terms of AUs during 2014 were: Broilers (286.4 thousand AUs), Beef Cows (183.8 thousand AUs), and Turkeys (46.5 thousand AUs). Total animal units in West Virginia during 2014 were 535.4 thousand AUs.



- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- There were 535,435 AUs in West Virginia in 2014 representing only 0.45% of the U.S. total.

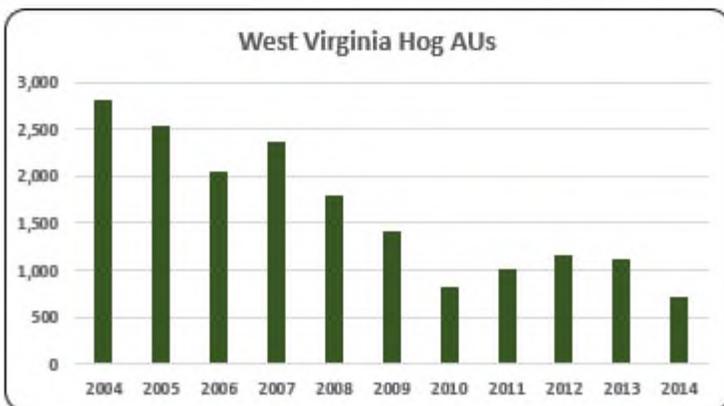
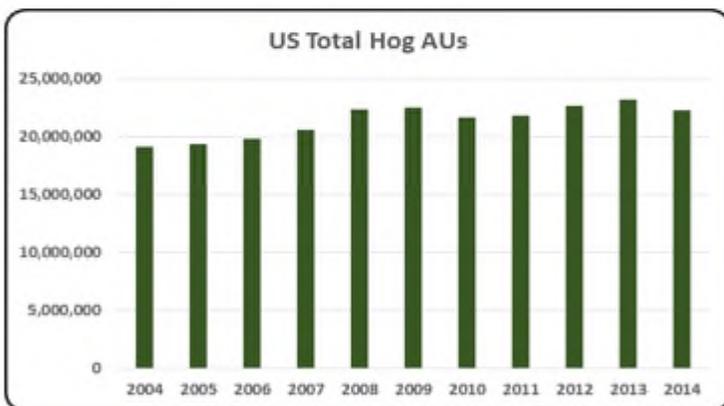
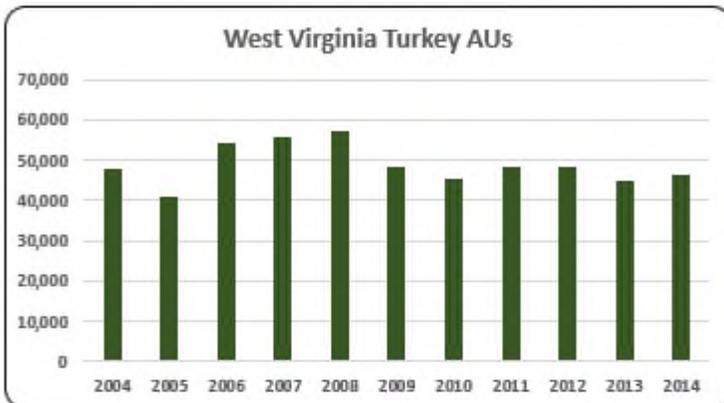
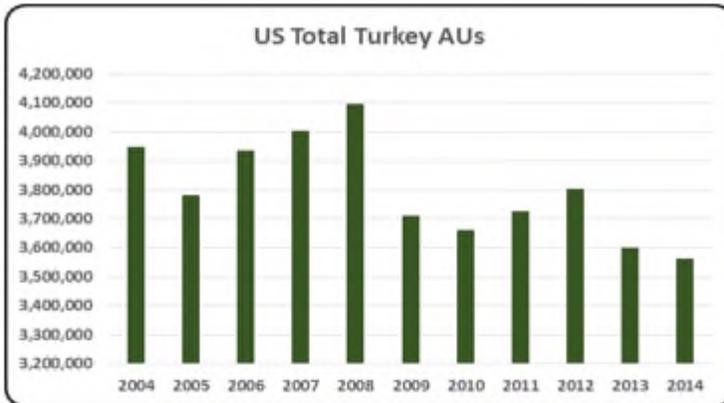


- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).

- On average, there were 188,770 broiler AUs in 2014. Broiler production fell 11.0% in 2014 compared to the previous year.

- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).

- Layer production declined 18.5% from 6,707 layer AUs in 2004 to 5,468 layer AUs in 2014.

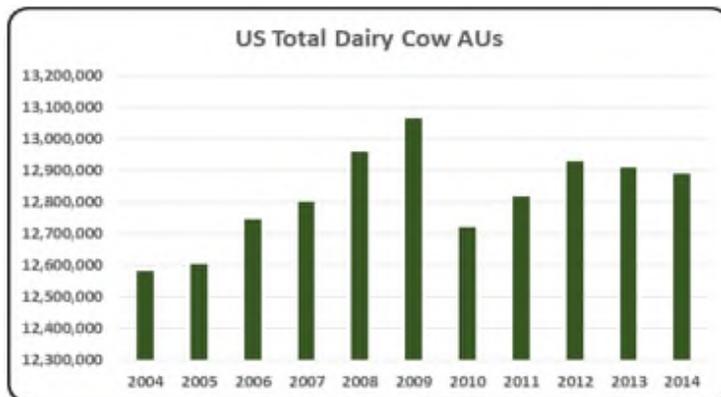


- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

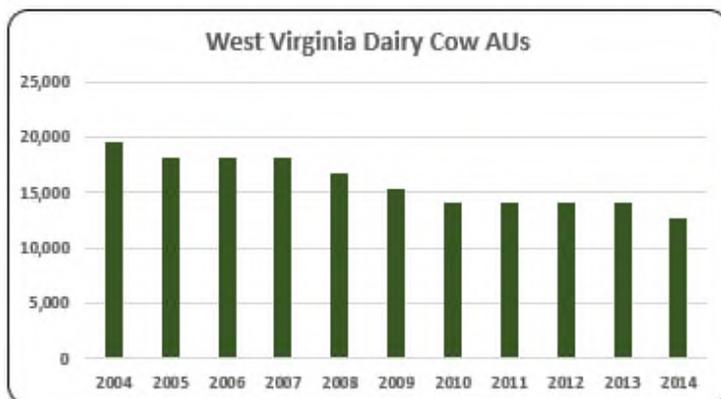
- Turkey production varied from a low in 2005 of 40,714 turkey AUs to high of 57,369 turkey AUs in 2008. There were 46,485 turkey AUs in 2014.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

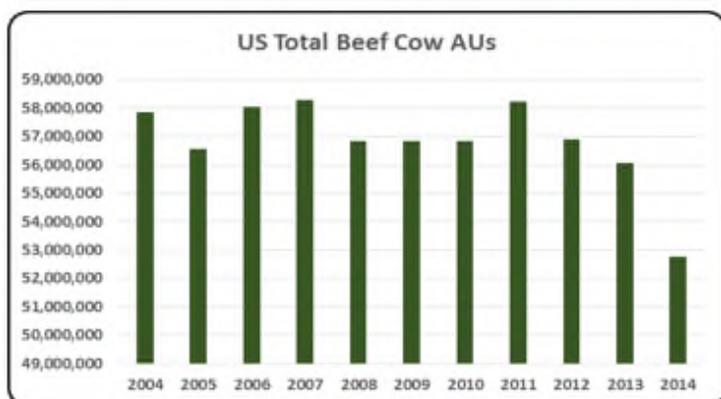
- Hog production declined 74.9% from the high level of hog production at the beginning of the decade (2,805 hog AUs) to the lowest level of production in 2014 (705 hog AUs).



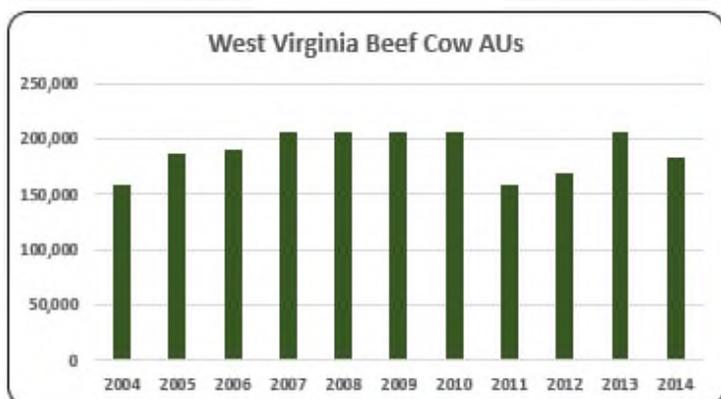
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- There were 12,600 dairy cow AUs in West Virginia in 2014. Dairy cow AUs in 2014 were 31% below 2004 (19,600 dairy cow AUs).



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Thirty four percent (183,750 beef cow AUs) of all animal production in West Virginia in 2014 was concentrated in beef cow production. Beef cow production decreased 11.0% in 2014 compared to 2013.

West Virginia Additional Information and Methodology

Animal agriculture is a modest part of West Virginia's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in West Virginia, of interest is the degree to which the industry impacts the West Virginia economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for West Virginia animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted West Virginia's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in West Virginia which have occurred. As shown in this state report, West Virginia has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in West Virginia. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

West Virginia Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on West Virginia's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in West Virginia, \$1.451 to \$1.894 million in total economic activity, \$0.234 to \$0.289 in household wages and 7 to 9 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 1.8944 | \$ 0.2893 | 9.1 |
| | Hogs, Pigs, and Other | \$ 1.4507 | \$ 0.2337 | 7.4 |
| | Poultry and Eggs | \$ 1.6513 | \$ 0.2597 | 7.4 |
| | Dairy | \$ 1.5631 | \$ 0.2626 | 8.6 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | | |
|--------------------------------------|------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------|
| Animal Units (AUs) | Beef Cattle AUs | 159,300 | 187,350 | 189,750 | 206,700 | 205,350 | 205,350 | 205,350 | 158,850 | 168,330 | 206,385 | 183,750 | |
| | Hog and Pig AUs | 2,805 | 2,535 | 2,055 | 2,370 | 1,785 | 1,410 | 825 | 1,020 | 1,170 | 1,125 | 705 | |
| | Broiler AUs | 252,949 | 260,765 | 264,232 | 261,460 | 252,694 | 243,337 | 257,790 | 256,587 | 282,544 | 289,444 | 286,427 | |
| | Turkey AUs | 48,000 | 40,714 | 54,298 | 55,867 | 57,369 | 48,356 | 45,349 | 48,202 | 48,206 | 44,897 | 46,485 | |
| | Egg Layer AUs | 6,707 | 7,387 | 7,128 | 7,183 | 6,978 | 6,104 | 6,063 | 6,099 | 5,300 | 5,382 | 5,468 | |
| | Dairy AUs | 19,600 | 18,200 | 18,200 | 18,200 | 16,800 | 15,400 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 12,600 |
| | Total Animal Units | 489,361 | 516,951 | 535,663 | 551,781 | 540,977 | 519,956 | 529,377 | 484,758 | 519,550 | 561,233 | 535,435 | |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 83,990 | \$ 99,889 | \$ 103,729 | \$ 97,904 | \$ 103,023 | \$ 100,171 | \$ 106,340 | \$ 141,611 | \$ 170,343 | \$ 170,384 | \$ 219,366 | |
| | Hogs and Pigs (\$1,000) | \$ 2,287 | \$ 1,750 | \$ 1,679 | \$ 1,630 | \$ 1,193 | \$ 1,117 | \$ 699 | \$ 1,298 | \$ 1,497 | \$ 1,184 | \$ 961 | |
| | Broilers (\$1,000) | \$ 155,848 | \$ 163,305 | \$ 132,756 | \$ 160,020 | \$ 161,644 | \$ 151,176 | \$ 166,772 | \$ 156,794 | \$ 188,000 | \$ 233,816 | \$ 236,773 | |
| | Turkeys (\$1,000) | \$ 29,702 | \$ 31,174 | \$ 43,654 | \$ 50,216 | \$ 57,243 | \$ 46,411 | \$ 52,638 | \$ 63,017 | \$ 64,241 | \$ 53,599 | \$ 60,152 | |
| | Eggs (\$1,000) | \$ 32,325 | \$ 30,473 | \$ 32,210 | \$ 32,723 | \$ 30,275 | \$ 28,183 | \$ 38,911 | \$ 39,398 | \$ 40,760 | \$ 46,209 | \$ 55,886 | |
| | Milk (\$1,000) | \$ 32,010 | \$ 30,264 | \$ 26,800 | \$ 38,610 | \$ 34,028 | \$ 20,898 | \$ 26,533 | \$ 32,656 | \$ 29,260 | \$ 30,856 | \$ 34,160 | |
| | Other | \$ 2,769 | \$ 2,968 | \$ 3,046 | \$ 3,449 | \$ 3,361 | \$ 3,227 | \$ 4,099 | \$ 3,963 | \$ 4,135 | \$ 4,307 | \$ 4,480 | |
| | Sheep and Lambs (\$1,000) | \$ 1,681 | \$ 1,823 | \$ 1,844 | \$ 2,189 | \$ 2,044 | \$ 1,852 | \$ 2,667 | \$ 2,474 | \$ 2,589 | \$ 2,703 | \$ 2,818 | |
| | Aquaculture (\$1,000) | \$ 1,088 | \$ 1,145 | \$ 1,202 | \$ 1,260 | \$ 1,317 | \$ 1,375 | \$ 1,432 | \$ 1,489 | \$ 1,547 | \$ 1,604 | \$ 1,661 | |
| | Total (\$1,000) | \$ 338,931 | \$ 359,823 | \$ 343,874 | \$ 384,552 | \$ 390,767 | \$ 351,183 | \$ 395,992 | \$ 438,737 | \$ 498,236 | \$ 540,355 | \$ 611,778 | |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 |
|--------------------------|--|-----------------|----------------|----------------|----------------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 10,276 | 9,878 | 10,481 | 9,430 |
| | Cattle feedlots (112112) | 467 | 379 | 297 | 153 |
| | Dairy cattle and milk production (11212) | 249 | 278 | 165 | 155 |
| | Hog and pig farming (1122) | 124 | 217 | 335 | 170 |
| | Poultry and egg production (1123) | 428 | 520 | 1,113 | 680 |
| | Sheep and goat farming (1124) | 364 | 631 | 968 | 693 |
| | Animal aquaculture and other animal production (1125,1129) | 1,036 | 2,328 | 2,635 | 1,848 |
| Value of Sales (\$1,000) | Cattle and Calves | 117,505 | 117,967 | 164,962 | 217,411 |
| | Hogs and Pigs | 2,719 | 1,992 | 2,089 | withheld |
| | Poultry and Eggs | 226,607 | 250,922 | 301,708 | 401,439 |
| | Milk and Other Dairy Products | 35,534 | 32,202 | 31,386 | 32,654 |
| | Aquaculture | n/a | 2,712 | 3,478 | withheld |
| | Other (calculated) | 8,058 | 7,326 | 9,734 | 6,410 |
| | Total | 390,423 | 413,121 | 513,357 | 657,914 |
| Input Purchases | Livestock and poultry purchased | (Farms) 5,481 | 5,911 | 5,845 | 6,198 |
| | | \$1,000 63,068 | 63,817 | 96,910 | 128,271 |
| | Breeding livestock purchased | (Farms) n/a | 3,255 | 2,800 | 3,343 |
| | | \$1,000 n/a | 8,075 | 8,821 | 22,374 |
| | Other livestock and poultry purchased | (Farms) n/a | 3,393 | 3,814 | 3,820 |
| | | \$1,000 n/a | 55,742 | 88,089 | 105,897 |
| | Feed purchased | (Farms) 10,508 | 14,291 | 14,027 | 15,066 |
| | | \$1,000 154,556 | 130,696 | 177,847 | 327,286 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 415,567 | \$ 63,463 | 2,002 | \$ 16,710 |
| | Hogs, Pigs, and Other | \$ 7,893 | \$ 1,271 | 40 | \$ 335 |
| | Poultry and Eggs | \$ 582,597 | \$ 91,625 | 2,602 | \$ 24,125 |
| | Dairy | \$ 53,395 | \$ 8,970 | 295 | \$ 2,362 |
| | Total | \$ 1,059,452 | \$ 165,329 | 4,939 | \$ 43,531 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 216,164 | \$ 33,011 | 1,041 | \$ 8,692 |
| | Hogs, Pigs, and Other | \$ (1,299) | \$ (209) | (7) | \$ (55) |
| | Poultry and Eggs | \$ 131,712 | \$ 20,714 | 588 | \$ 5,454 |
| | Dairy | \$ (9,310) | \$ (1,564) | (51) | \$ (412) |
| | Total | \$ 337,267 | \$ 51,952 | 1,571 | \$ 13,679 |
| RIMS II Multipliers | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| | Cattle and Calves | \$ 1.8944 | \$ 0.2893 | 9.1 | |
| | Hogs, Pigs, and Other | \$ 1.4507 | \$ 0.2337 | 7.4 | |
| | Poultry and Eggs | \$ 1.6513 | \$ 0.2597 | 7.4 | |
| | Dairy | \$ 1.5631 | \$ 0.2626 | 8.6 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 6.0% |
| | Total | | | | 26.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: WISCONSIN

Wisconsin Executive Summary

The use of soybean meal as a key feed ingredient is an important part of Wisconsin's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a key driver of animal agriculture's success in Wisconsin. The success of Wisconsin animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Wisconsin during 2014 animal agriculture contributed:

- \$20.5 billion in economic output
- 145,500 jobs
- \$3.7 billion in earnings
- \$1.0 billion in income taxes paid at local, state, and federal levels
- \$311.2 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Wisconsin increased economic output by over \$7.2 billion, boosted household earnings by \$1.3 billion, contributed 50,300 additional jobs and paid \$347.7 million in additional tax revenues.

Wisconsin's animal agriculture consumed about 719.0 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Dairy Cows (485.5 thousand tons)
- Beef Cows (69.3 thousand tons)
- Broilers (62.1 thousand tons)

This report examines animal agriculture in Wisconsin over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Wisconsin, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Wisconsin and beyond.

Wisconsin Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Wisconsin's economy. In 2014, Wisconsin's animal agriculture contributed the following to the economy:

- About \$20.5 billion in economic output
- \$3.7 billion in household earnings
- 145,500 jobs
- \$1.0 billion in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Wisconsin's animal agriculture has:

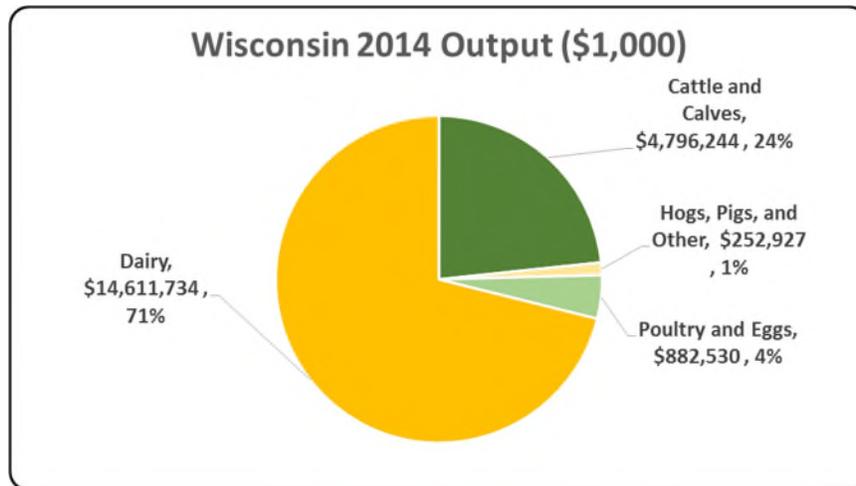
- Increased economic output by \$7.2 billion
- Boosted household earnings by \$1.3 billion
- Added 50,300 jobs
- Paid an additional \$347.7 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|---------------|------------------|--------------------|
| Output (\$1,000) | \$ 20,543,435 | \$ 7,164,928 | 53.56% |
| Earnings (\$1,000) | \$ 3,738,214 | \$ 1,295,820 | 53.06% |
| Employment (Jobs) | 145,500 | 50,300 | 52.84% |
| Income Taxes Paid (\$1,000) | \$ 1,002,963 | \$ 347,669 | 53.06% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 311,228 | | |

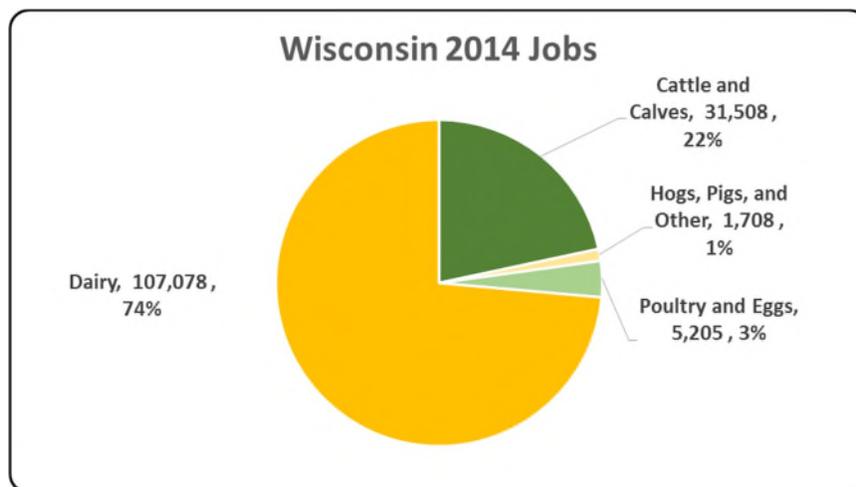
Wisconsin Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Wisconsin economy. Animal agriculture’s impact on Wisconsin total economic output is about \$20.5 billion.



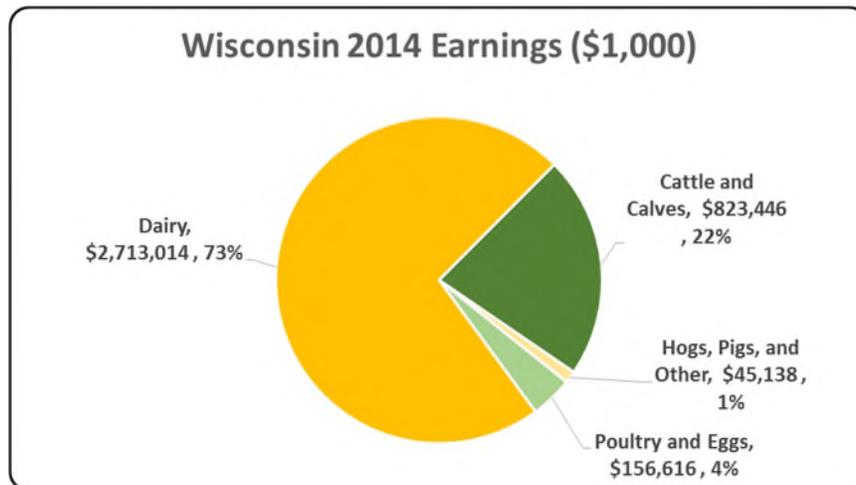
Wisconsin Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Wisconsin in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Wisconsin total jobs, contributing 145,500 jobs within and outside of animal agriculture.



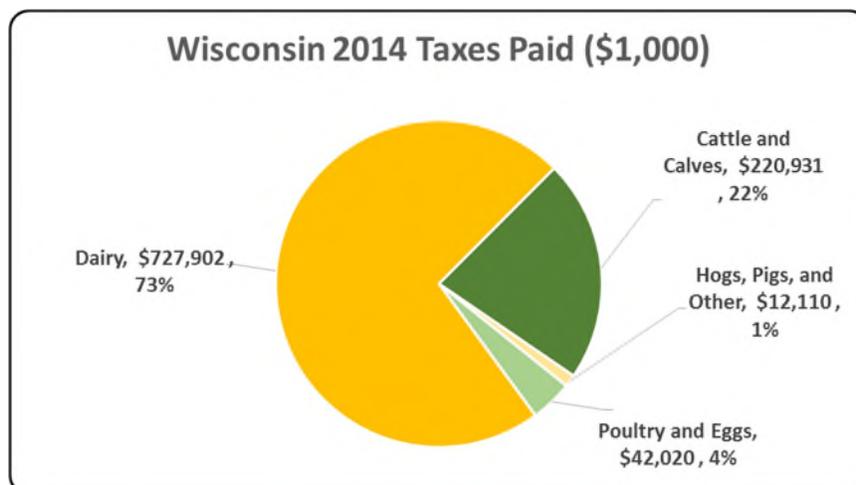
Wisconsin Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Wisconsin economy in terms of earnings. Wisconsin's animal agriculture contributed about \$3.7 billion to household earnings in 2014.



Wisconsin Taxes Paid by Animal Agriculture

Wisconsin's animal agriculture is also a significant source of tax revenue. In 2014, the state's animal agriculture industry paid about \$1,003.0 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$311.2 million in property taxes paid by all of Wisconsin agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



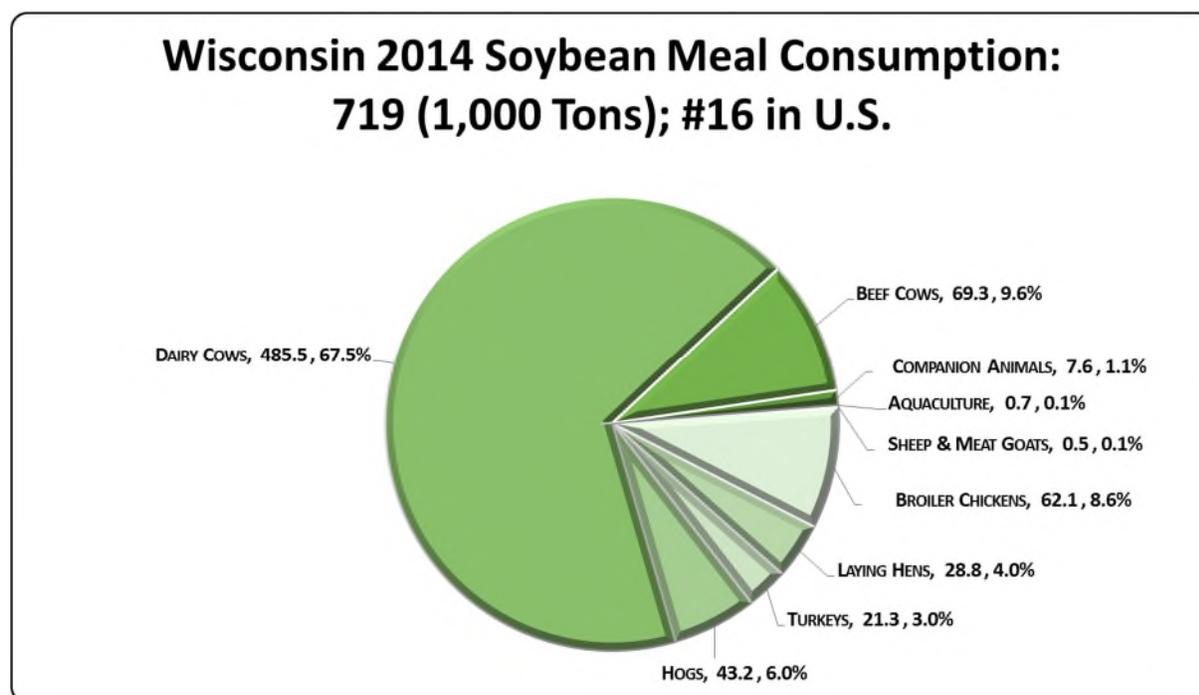
Wisconsin Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Wisconsin's animal agriculture consumed almost 719.0 thousand tons of soybean meal in 2014, placing the state as #16 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Dairy Cows (485.5 thousand tons)
- Beef Cows (69.3 thousand tons)
- Broilers (62.1 thousand tons)



Wisconsin Animal Unit (AU) Trends

Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Wisconsin. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Wisconsin and to give perspective on Wisconsin's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

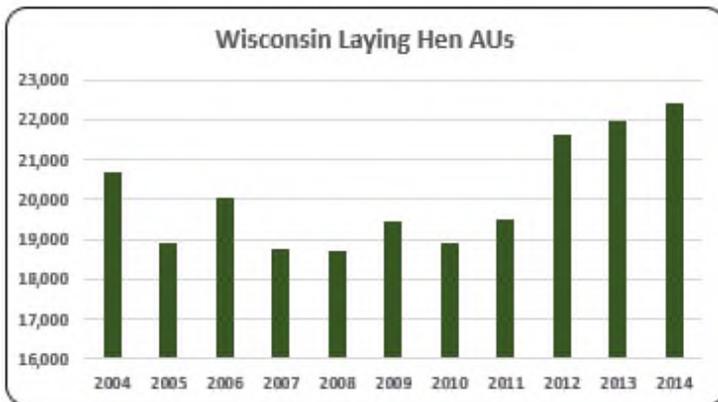
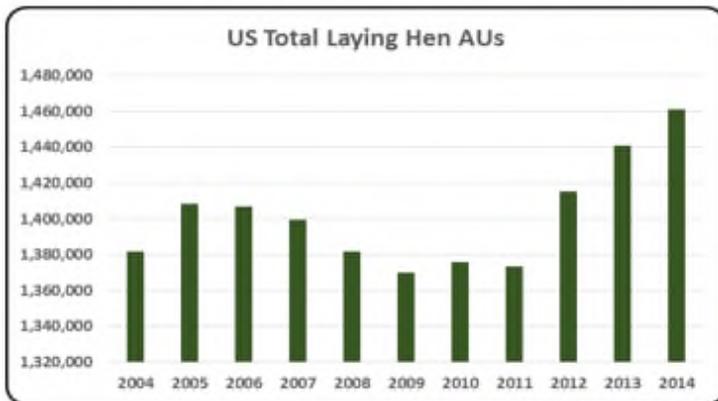
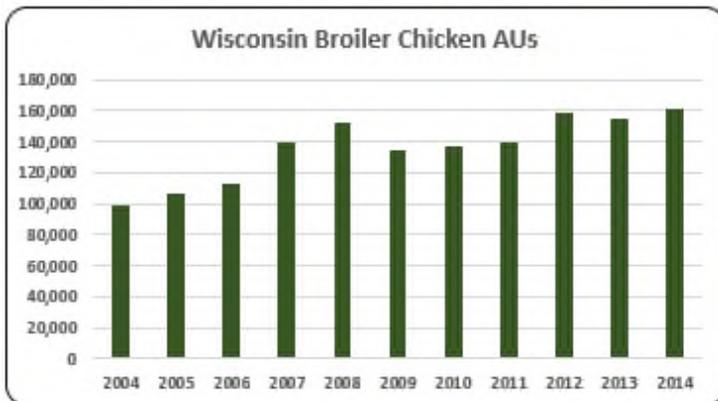
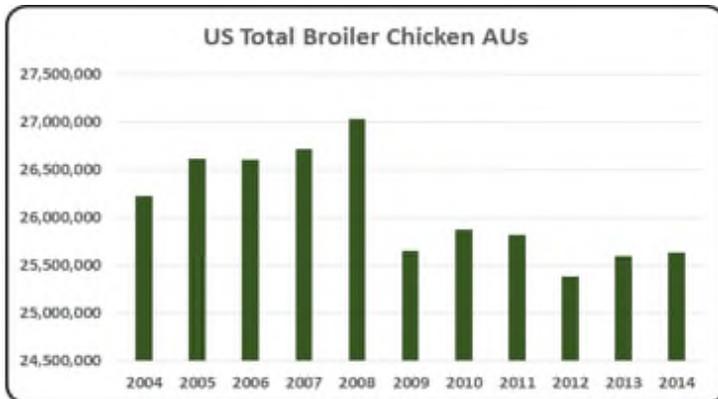
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Wisconsin, the largest three segments of animal agriculture in terms of AUs during 2014 were: Dairy Cows (1,778.0 thousand AUs), Beef Cows (1,169.8 thousand AUs), and Broilers (160.5 thousand AUs). Total animal units in Wisconsin during 2014 were 3,282.8 thousand AUs.



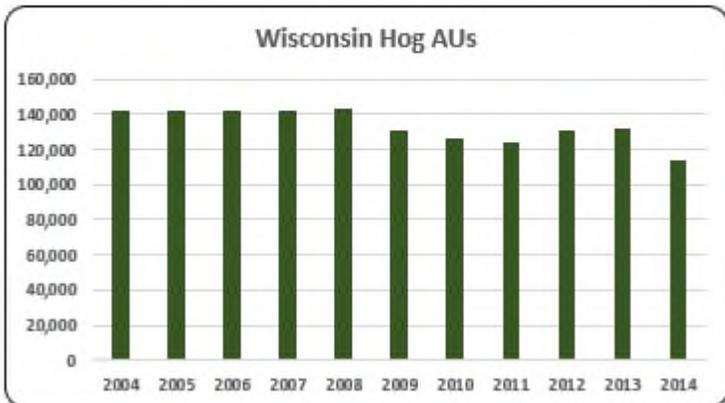
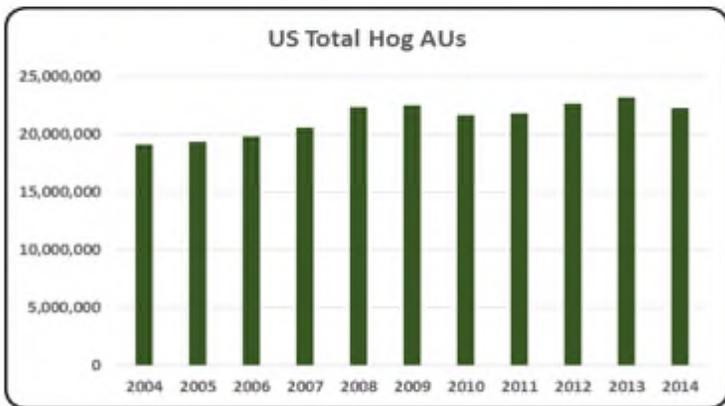
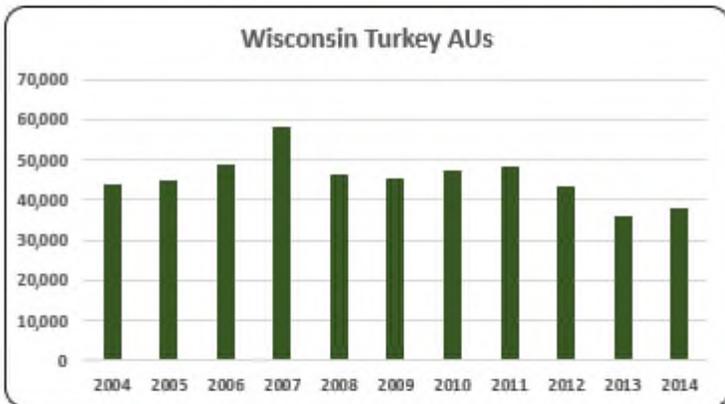
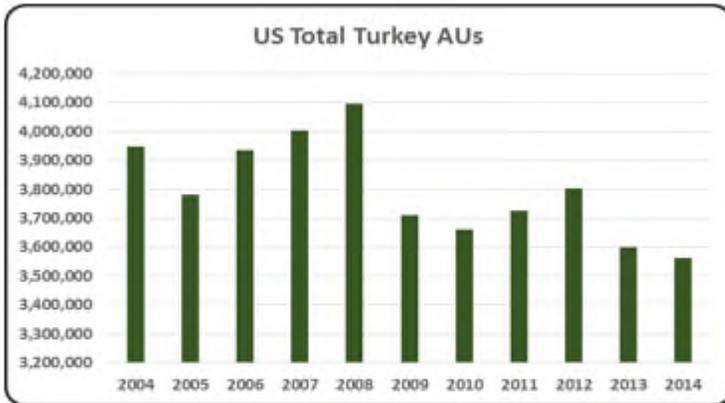
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



- There were 3,282.8 thousand AUs in Wisconsin in 2014 representing about 2.77% of all AUs in the U.S. AUs increased 4.8% in 2014 relative to 2004 (3,133.8 thousand AUs).



- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- On average, there were 135,936 broiler AUs in Wisconsin from 2004 to 2014. Broiler AUs in 2014 (160,496 broiler AUs) rose 62.2% compared to 2004 (98,955 broiler AUs).
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layer production was the smallest animal production in Wisconsin during last decade with only 0.68% (22,422 layer AUs) of the total animal production in 2014.

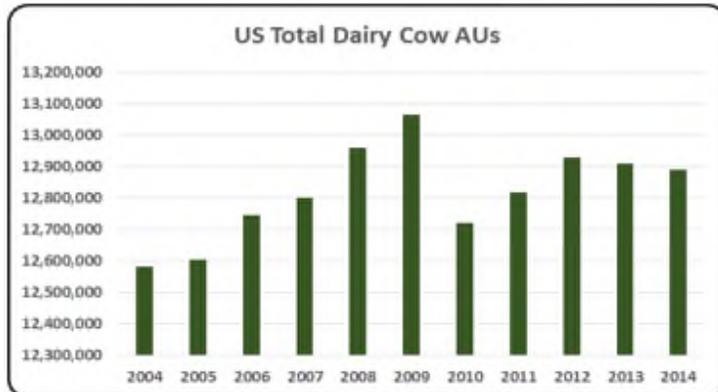


- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.

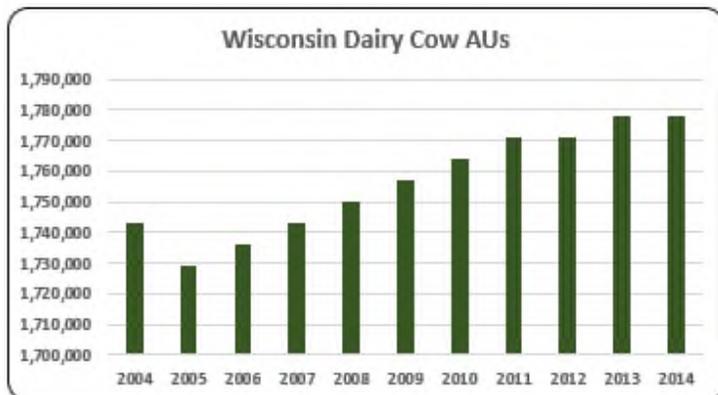
- There were 45,437 turkey AUs on average during the last decade. 2014 turkey AUs (37,775) rose 4.4 year-over-year.

- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.

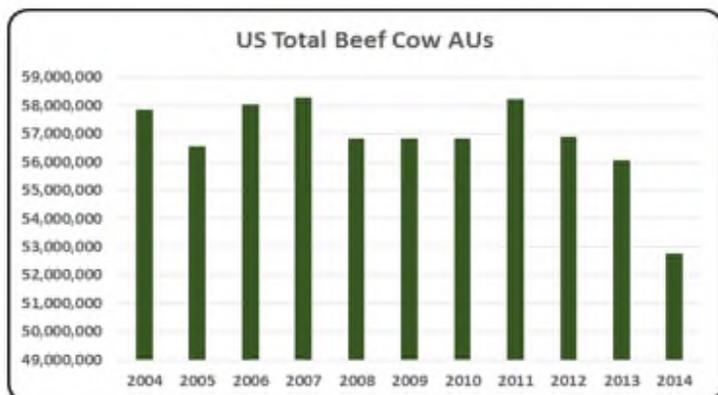
- Hog production in Wisconsin in 2014 decreased to a record low of 114,300 hog AUs. The average number of hog AUs throughout the decade was 133,635.



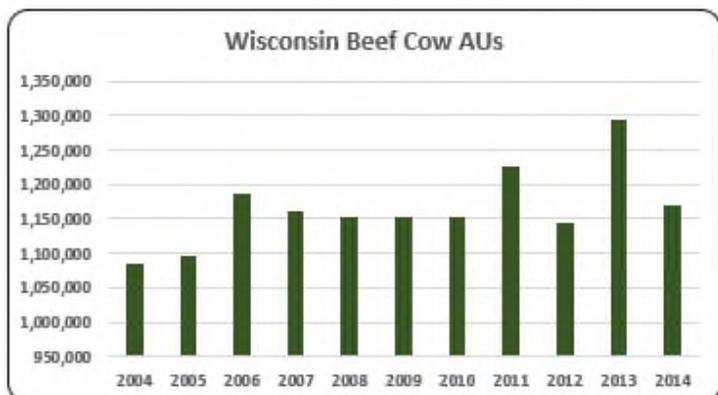
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- As the second largest dairy cow producer in the country, Wisconsin accounted for 13.79% (1,778.0 thousand dairy AUs) of all dairy cows in the U.S. in 2014.



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production made up 35.63% (1,169.8 thousand beef cow AUs) of all animal production in Wisconsin in 2014. Beef cow production in 2014 fell 9.5% compared to 2013.

Wisconsin Additional Information and Methodology

Animal agriculture is an important part of Wisconsin's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Wisconsin, of interest is the degree to which the industry impacts the Wisconsin economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Wisconsin animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Wisconsin's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Wisconsin which have occurred. As shown in this state report, Wisconsin has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Wisconsin. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Wisconsin Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Wisconsin's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Wisconsin, \$1.882 to \$2.580 million in total economic activity, \$0.336 to \$0.458 in household wages and 13 to 16 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.5005 | \$ 0.4293 | 16.4 |
| | Hogs, Pigs, and Other | \$ 1.8822 | \$ 0.3359 | 12.7 |
| | Poultry and Eggs | \$ 2.5797 | \$ 0.4578 | 15.2 |
| | Dairy | \$ 2.1457 | \$ 0.3984 | 15.7 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,085,100 | 1,097,550 | 1,185,150 | 1,162,350 | 1,152,000 | 1,152,000 | 1,152,000 | 1,225,185 | 1,144,635 | 1,292,595 | 1,169,790 |
| | Hog and Pig AUs | 142,350 | 142,200 | 142,365 | 141,510 | 143,700 | 130,845 | 126,165 | 124,050 | 130,350 | 132,150 | 114,300 |
| | Broiler AUs | 98,955 | 106,958 | 112,822 | 139,112 | 152,442 | 134,762 | 136,841 | 139,710 | 159,006 | 154,190 | 160,496 |
| | Turkey AUs | 43,768 | 44,888 | 48,775 | 57,966 | 46,334 | 45,385 | 47,274 | 48,117 | 43,359 | 36,170 | 37,775 |
| | Egg Layer AUs | 20,668 | 18,928 | 20,048 | 18,780 | 18,728 | 19,444 | 18,880 | 19,512 | 21,629 | 21,976 | 22,422 |
| | Dairy AUs | 1,743,000 | 1,729,000 | 1,736,000 | 1,743,000 | 1,750,000 | 1,757,000 | 1,764,000 | 1,771,000 | 1,771,000 | 1,778,000 | 1,778,000 |
| | Total Animal Units | 3,133,840 | 3,139,524 | 3,245,160 | 3,262,718 | 3,263,204 | 3,239,437 | 3,245,160 | 3,327,575 | 3,269,980 | 3,415,080 | 3,282,783 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 800,838 | \$ 855,031 | \$ 846,927 | \$ 819,104 | \$ 778,254 | \$ 708,203 | \$ 860,662 | \$ 1,164,319 | \$ 1,292,043 | \$ 1,443,995 | \$ 1,918,114 |
| | Hogs and Pigs (\$1,000) | \$ 111,991 | \$ 112,235 | \$ 105,652 | \$ 108,595 | \$ 107,923 | \$ 90,766 | \$ 110,277 | \$ 135,219 | \$ 122,921 | \$ 128,999 | \$ 122,235 |
| | Broilers (\$1,000) | \$ 68,445 | \$ 70,268 | \$ 62,345 | \$ 91,530 | \$ 99,866 | \$ 87,927 | \$ 95,243 | \$ 89,643 | \$ 111,100 | \$ 130,809 | \$ 142,879 |
| | Turkeys (\$1,000) | \$ 40,610 | \$ 43,061 | \$ 50,893 | \$ 66,850 | \$ 62,581 | \$ 41,969 | \$ 56,227 | \$ 63,062 | \$ 62,885 | \$ 41,412 | \$ 69,337 |
| | Eggs (\$1,000) | \$ 56,679 | \$ 39,702 | \$ 45,323 | \$ 89,263 | \$ 102,910 | \$ 78,301 | \$ 78,316 | \$ 85,397 | \$ 101,214 | \$ 115,879 | \$ 129,890 |
| | Milk (\$1,000) | \$ 3,732,365 | \$ 3,567,096 | \$ 3,111,934 | \$ 4,647,440 | \$ 4,625,208 | \$ 3,306,309 | \$ 4,191,635 | \$ 5,289,774 | \$ 5,281,456 | \$ 5,597,116 | \$ 6,809,775 |
| | Other | \$ 13,717 | \$ 13,732 | \$ 11,960 | \$ 12,248 | \$ 11,634 | \$ 12,012 | \$ 14,129 | \$ 12,414 | \$ 12,324 | \$ 12,234 | \$ 12,143 |
| | Sheep and Lambs (\$1,000) | \$ 6,477 | \$ 6,707 | \$ 5,150 | \$ 5,653 | \$ 5,255 | \$ 5,848 | \$ 8,180 | \$ 6,681 | \$ 6,806 | \$ 6,931 | \$ 7,055 |
| | Aquaculture (\$1,000) | \$ 7,240 | \$ 7,025 | \$ 6,810 | \$ 6,595 | \$ 6,379 | \$ 6,164 | \$ 5,949 | \$ 5,734 | \$ 5,518 | \$ 5,303 | \$ 5,088 |
| | Total (\$1,000) | \$ 4,824,645 | \$ 4,701,125 | \$ 4,235,034 | \$ 5,835,030 | \$ 5,788,376 | \$ 4,325,487 | \$ 5,406,488 | \$ 6,839,828 | \$ 6,983,943 | \$ 7,470,443 | \$ 9,204,373 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|------------------|------------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 9,469 | 9,852 | 11,593 | 10,241 | |
| | Cattle feedlots (112112) | 2,540 | 3,749 | 2,485 | 892 | |
| | Dairy cattle and milk production (11212) | 20,958 | 16,096 | 13,081 | 10,401 | |
| | Hog and pig farming (1122) | 1,179 | 759 | 989 | 475 | |
| | Poultry and egg production (1123) | 466 | 910 | 2,297 | 1,591 | |
| | Sheep and goat farming (1124) | 805 | 1,117 | 1,501 | 1,555 | |
| | Animal aquaculture and other animal production (1125,1129) | 2,864 | 6,347 | 5,816 | 4,814 | |
| Value of Sales (\$1,000) | Cattle and Calves | 702,854 | 834,895 | 1,014,553 | 1,416,881 | |
| | Hogs and Pigs | 156,106 | 79,836 | 100,309 | 90,589 | |
| | Poultry and Eggs | 242,238 | 224,968 | 375,284 | 465,717 | |
| | Milk and Other Dairy Products | 2,800,298 | 2,651,018 | 4,573,294 | 4,952,039 | |
| | Aquaculture | 5,226 | 14,262 | 14,182 | 13,847 | |
| | Other (calculated) | 132,891 | 128,225 | 220,410 | 192,404 | |
| | Total | 4,039,613 | 3,933,204 | 6,298,032 | 7,131,477 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 22,888 | 21,117 | 19,948 | 19,759 | |
| | | \$1,000 | 306,830 | 294,121 | 356,954 | 454,402 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 12,329 | 10,799 | 10,907 | |
| | | \$1,000 | <i>n/a</i> | 108,518 | 139,475 | 186,105 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 11,343 | 11,816 | 11,748 | |
| | | \$1,000 | <i>n/a</i> | 185,603 | 217,479 | 268,297 |
| Feed purchased | (Farms) 39,355 | 43,074 | 38,826 | 39,784 | | |
| | \$1,000 | 847,206 | 785,165 | 1,091,862 | 2,066,721 | |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|----------------------|---------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 4,796,244 | \$ 823,446 | 31,508 | \$ 220,931 |
| | Hogs, Pigs, and Other | \$ 252,927 | \$ 45,138 | 1,708 | \$ 12,110 |
| | Poultry and Eggs | \$ 882,530 | \$ 156,616 | 5,205 | \$ 42,020 |
| | Dairy | \$ 14,611,734 | \$ 2,713,014 | 107,078 | \$ 727,902 |
| | Total | \$ 20,543,435 | \$ 3,738,214 | 145,500 | \$ 1,002,963 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 2,286,648 | \$ 392,585 | 15,022 | \$ 105,330 |
| | Hogs, Pigs, and Other | \$ (43,599) | \$ (7,781) | (294) | \$ (2,088) |
| | Poultry and Eggs | \$ 346,718 | \$ 61,530 | 2,045 | \$ 16,508 |
| | Dairy | \$ 4,575,161 | \$ 849,487 | 33,528 | \$ 227,917 |
| | Total | \$ 7,164,928 | \$ 1,295,820 | 50,300 | \$ 347,669 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.5005 | \$ 0.4293 | 16.4 | |
| | Hogs, Pigs, and Other | \$ 1.8822 | \$ 0.3359 | 12.7 | |
| | Poultry and Eggs | \$ 2.5797 | \$ 0.4578 | 15.2 | |
| | Dairy | \$ 2.1457 | \$ 0.3984 | 15.7 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 6.5% |
| | Total | | | | 26.8% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

2004-2014 Economic Analysis of Animal Agriculture: WYOMING

Wyoming Executive Summary

The use of soybean meal as a key feed ingredient is a small part of Wyoming's animal agriculture. While the degree to which animal agriculture utilizes this versatile feed ingredient has fluctuated with time, it remains a factor in animal agriculture's success in Wyoming. The success of Wyoming animal agriculture in turn has a large impact on the rest of the state and regional economies. For example, in the state of Wyoming during 2014 animal agriculture contributed:

- \$2.6 billion in economic output
- 12,418 jobs
- \$391.8 million in earnings
- \$79.6 million in income taxes paid at local, state, and federal levels
- \$41.6 million in the form of property taxes

Plus, from 2004-2014 animal agriculture in Wyoming increased economic output by over \$694.2 million, boosted household earnings by \$105.1 million, contributed 3,334 additional jobs and paid \$21.4 million in additional tax revenues.

Wyoming's animal agriculture consumed about 46.9 thousand tons of soybean meal in 2014. This soybean meal was fed primarily to:

- Hogs (27.1 thousand tons)
- Beef Cows (10.2 thousand tons)
- Turkeys (2.5 thousand tons)

This report examines animal agriculture in Wyoming over the last decade. While this analysis is certainly instructive and allows improved understanding of animal agriculture's impact during that time, as the next decade unfolds in Wyoming, many opportunities and challenges will arise. And, if past is prologue, animal agriculture will continue to be a major contributor to the economic well-being of the people of Wyoming and beyond.

Wyoming Economic Impact of Animal Agriculture

Animal agriculture is an integral part of Wyoming's economy. In 2014, Wyoming's animal agriculture contributed the following to the economy:

- About \$2.6 billion in economic output
- \$391.8 million in household earnings
- 12,418 jobs
- \$79.6 million in income taxes

And the animal agriculture sector has shown substantial growth during challenging economic times. During the last decade Wyoming's animal agriculture has:

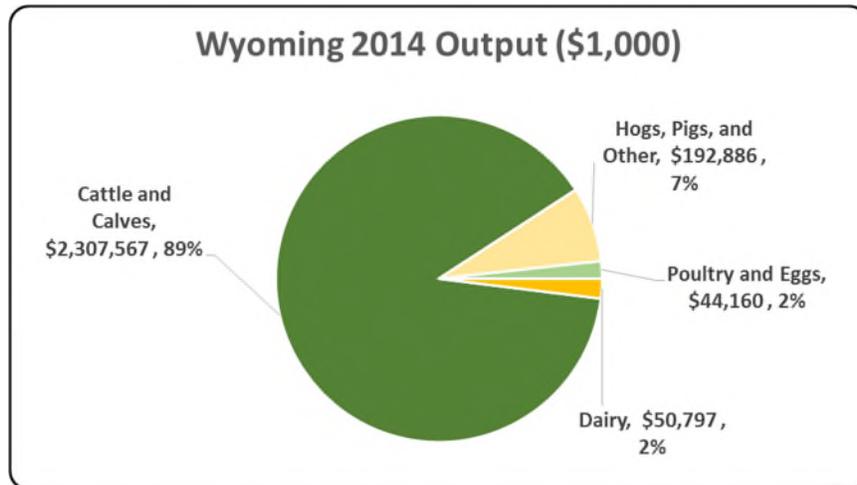
- Increased economic output by \$694.2 million
- Boosted household earnings by \$105.1 million
- Added 3,334 jobs
- Paid an additional \$21.4 million in income taxes

Below is a table which demonstrates this decade of change.

| Measure | 2014 | Change 2004-2014 | % Change 2004-2014 |
|---------------------------------------|--------------|------------------|--------------------|
| Output (\$1,000) | \$ 2,595,409 | \$ 694,216 | 36.51% |
| Earnings (\$1,000) | \$ 391,775 | \$ 105,065 | 36.64% |
| Employment (Jobs) | 12,418 | 3,334 | 36.70% |
| Income Taxes Paid (\$1,000) | \$ 79,648 | \$ 21,360 | 36.64% |
| Property Taxes Paid in 2012 (\$1,000) | \$ 41,580 | | |

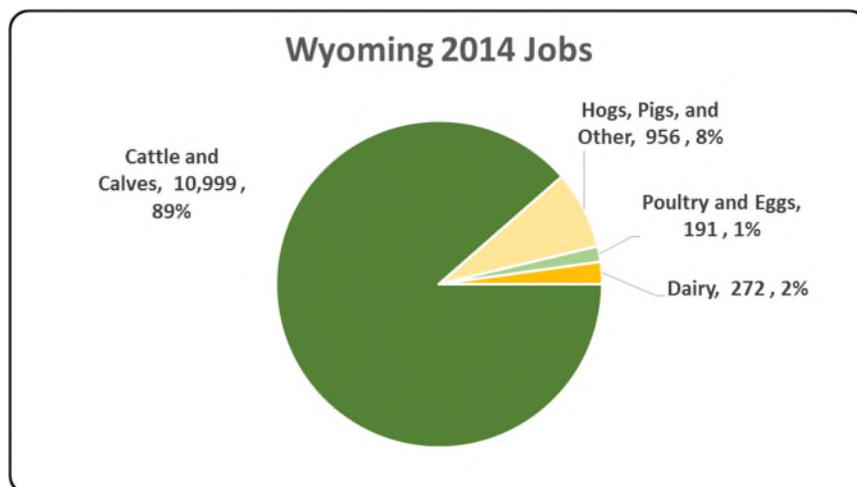
Wyoming Output

“Output” refers to the total value of all the output (production or sales) of a study area and/or industry within a study area and was calculated using RIMS II multipliers. This is a gross number that does not make any deductions for the cost or origination of inputs that were used in the production process. The chart illustrates the impact of animal agriculture to the Wyoming economy. Animal agriculture’s impact on Wyoming total economic output is about \$2.6 billion.



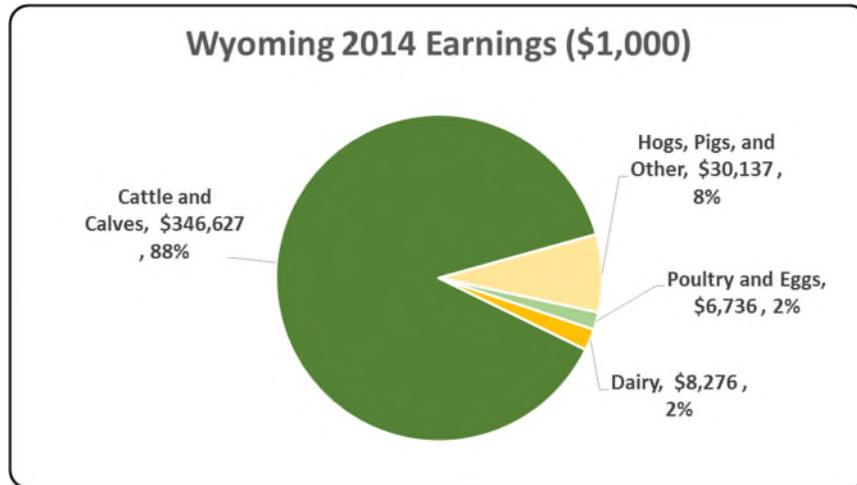
Wyoming Jobs

“Jobs” represents an estimate of the number of full or part-time positions (jobs) currently filled in an area and/or industry. The chart illustrates the contribution to Wyoming in terms of animal agriculture jobs. As shown, animal agriculture contributes significantly to Wyoming total jobs, contributing 12,418 jobs within and outside of animal agriculture.



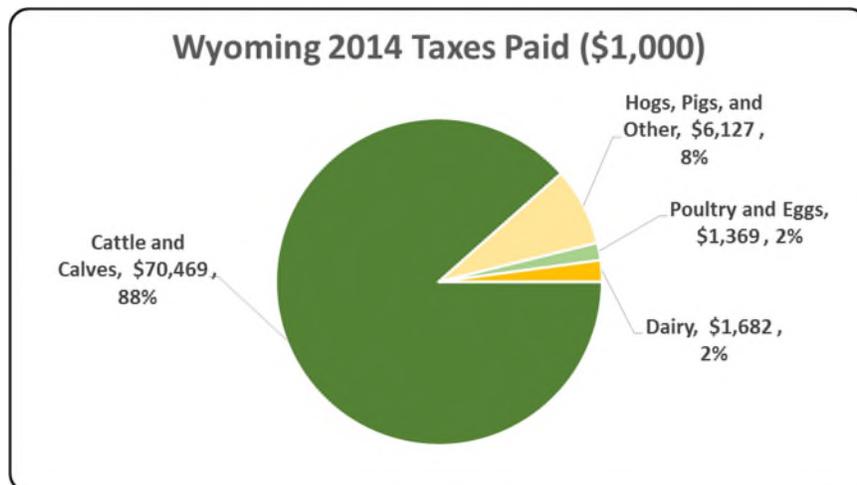
Wyoming Earnings

Earnings includes wages and salaries plus proprietors' income, which is the net earnings of sole-proprietors and partnerships. The chart illustrates the impact of animal agriculture to the Wyoming economy in terms of earnings. Wyoming's animal agriculture contributed about \$391.8 million to household earnings in 2014.



Wyoming Taxes Paid by Animal Agriculture

Wyoming's animal agriculture is also a significant source of tax revenue. In 2014, the state's animal agriculture industry paid about \$79.6 million in income taxes at local, state, and federal levels. Plus the 2012 Census of Agriculture estimated \$41.6 million in property taxes paid by all of Wyoming agriculture during 2012. Estimates of income taxes paid by animal agriculture are shown in the following chart.



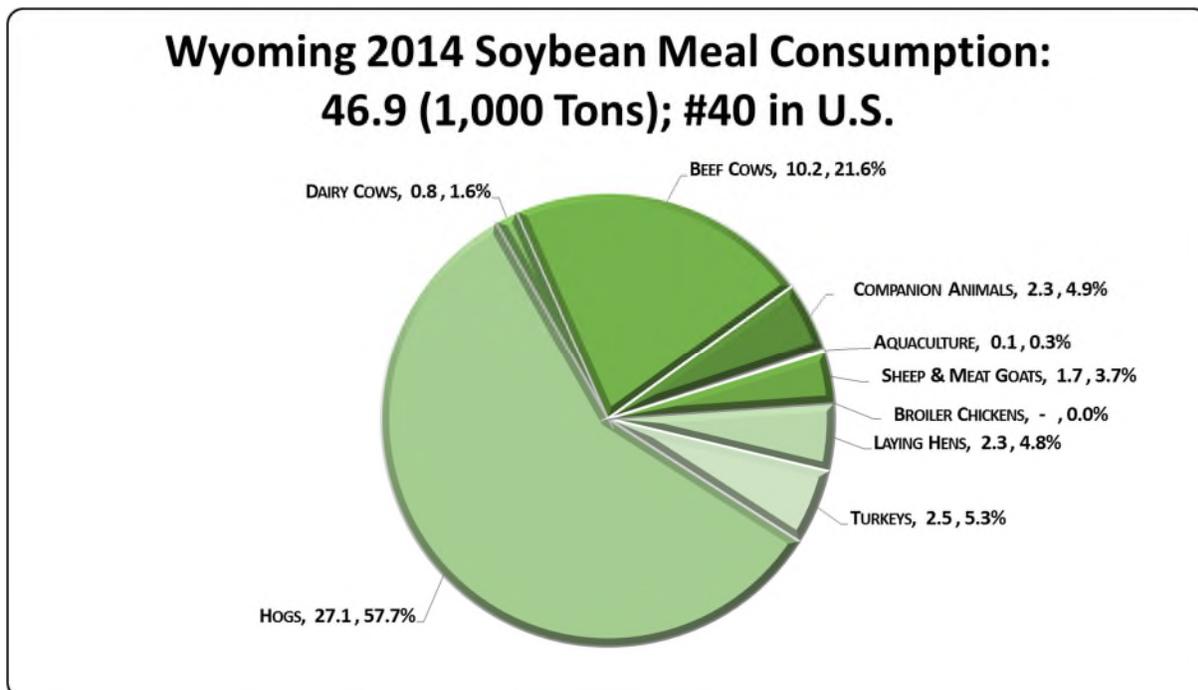
Wyoming Animal Agriculture Soybean Meal Consumption

The choice to use soybean meal in animal agriculture is highly dependent upon nutritional requirements of animals (which would encompass varying life stages within an animal species), accessibility to various feed ingredients capable of competing with soybean meal (from both a nutritional and price standpoint), and consumer preferences which have influence on production practices.

Through in-depth conversations with many of the nation's top nutritionists and researchers from both private industry and public institutions, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year by up to sixteen specific animal species has been estimated.

Wyoming's animal agriculture consumed almost 46.9 thousand tons of soybean meal in 2014, placing the state as #40 in the nation in terms of soybean meal consumption (see figure below). The three segments of animal agriculture that led the state in estimated soybean meal consumption are:

- Hogs (27.1 thousand tons)
- Beef Cows (10.2 thousand tons)
- Turkeys (2.5 thousand tons)

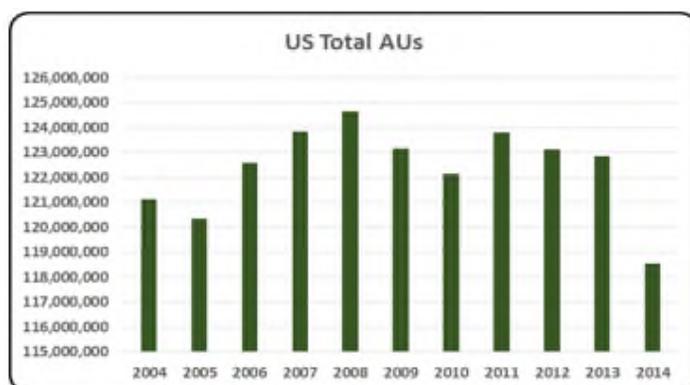


Wyoming Animal Unit (AU) Trends

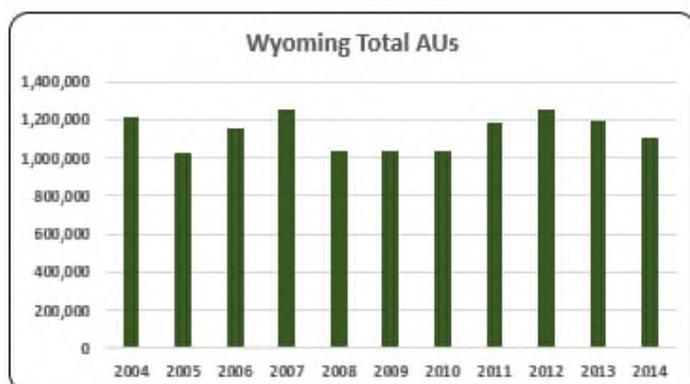
Over time, prices of feed, meat, eggs and milk, as well as levels of demand for these products in the United States and abroad have an impact on the size of animal agriculture in the State of Wyoming. Due to this reality, using a single year as a measure of the presence and strength of a sector can be misleading. The use of animal units allows for a more accurate comparison of differing sizes of livestock and poultry. This section is included to bring context to the question of what animal agriculture means to Wyoming and to give perspective on Wyoming's contribution to the nation's animal agriculture industry and beyond.

Similar to using a single year to measure the presence and strength of a sector, in some circumstances AUs can be misleading. This is because AUs do not reflect important considerations like increased weights, improved livability, increased laying potential, etc.

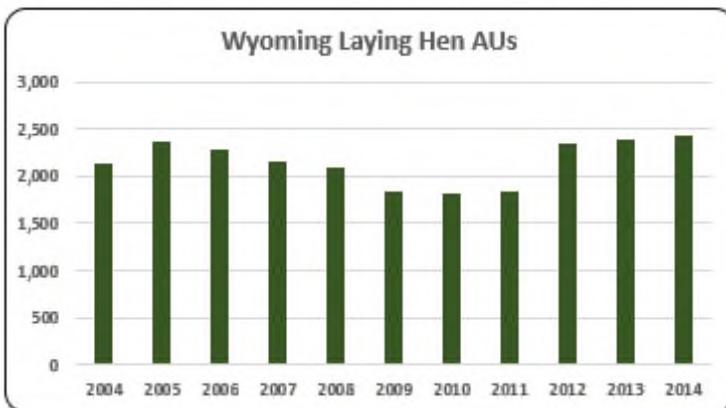
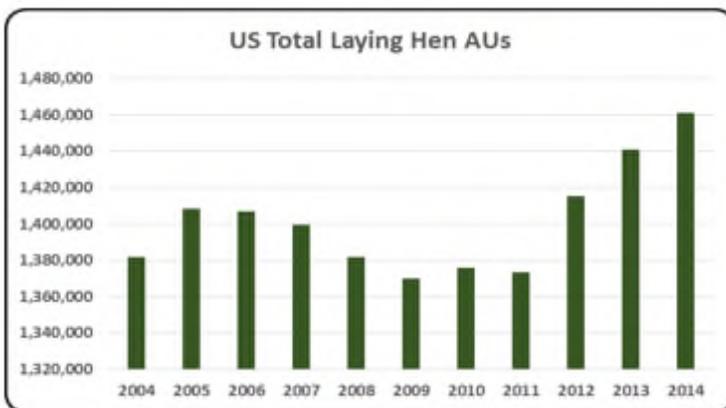
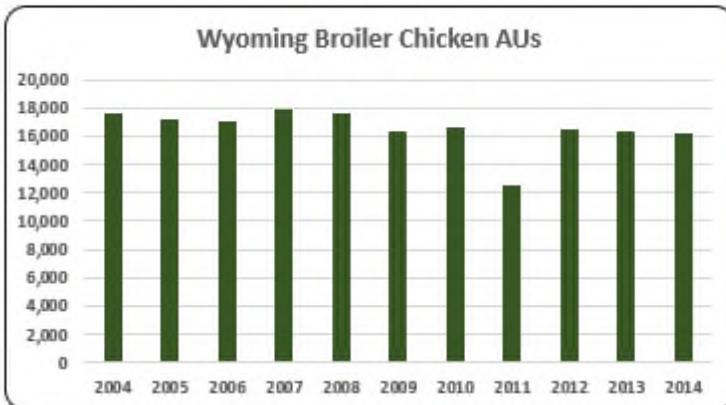
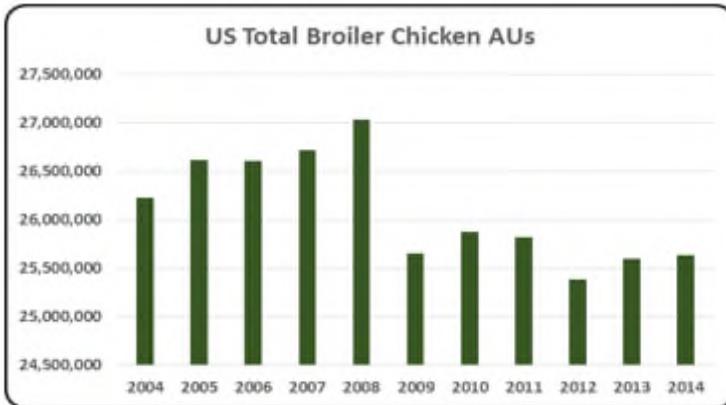
As shown in the accompanying charts and written commentary, certain components of animal agriculture are more present, and therefore more dominant than others. This is due primarily to geography (i.e., weather patterns and access to certain transportation hubs), proximity to high quality, relevant feed ingredients, and the local animal agriculture regulatory framework. In Wyoming, the largest three segments of animal agriculture in terms of AUs during 2014 were: Beef Cows (956.3 thousand AUs), Hogs (115.1 thousand AUs), and Broilers (16.3 thousand AUs). Total animal units in Wyoming during 2014 were 1,102.9 thousand AUs.



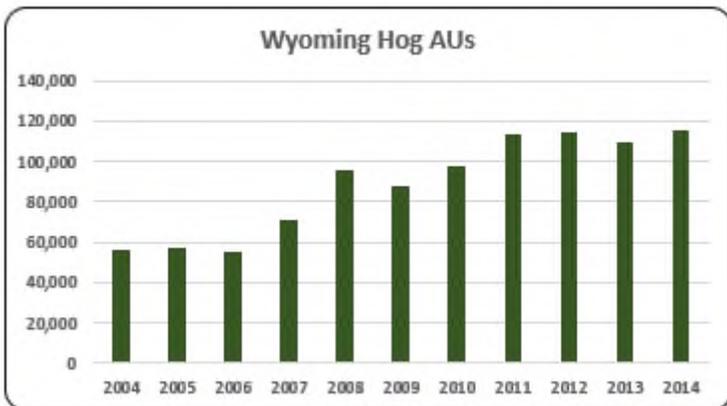
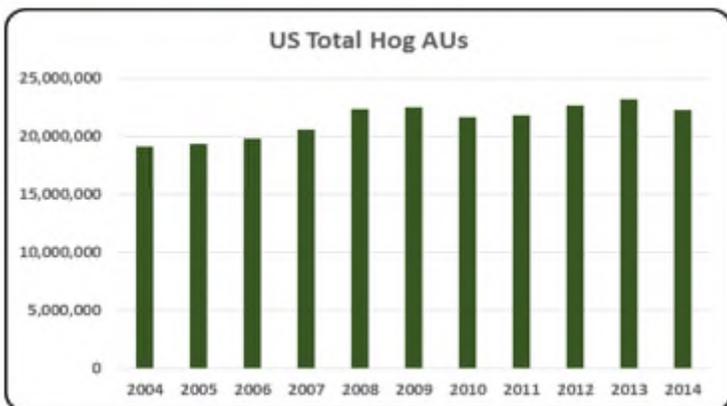
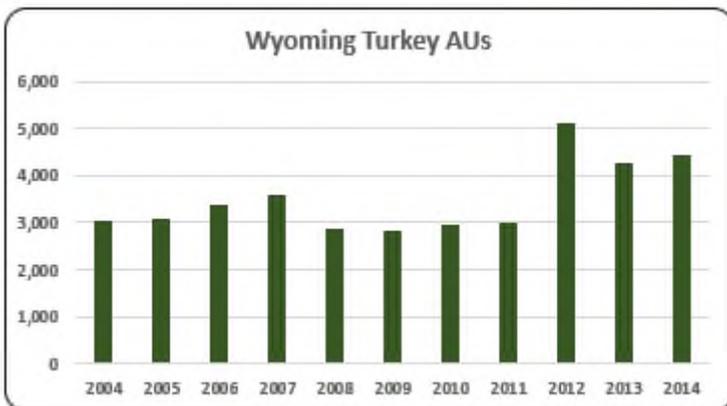
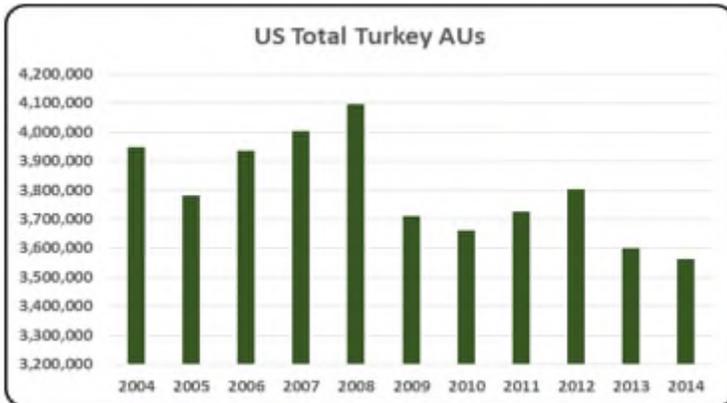
- Overall U.S. total AUs have varied from 2004 to 2014. In 2014 AUs were at an all-time low reflecting, in part, the impact of severe weather on cattle production in some parts of country. During the 2004-14 time period, total AUs in the nation peaked in 2008.



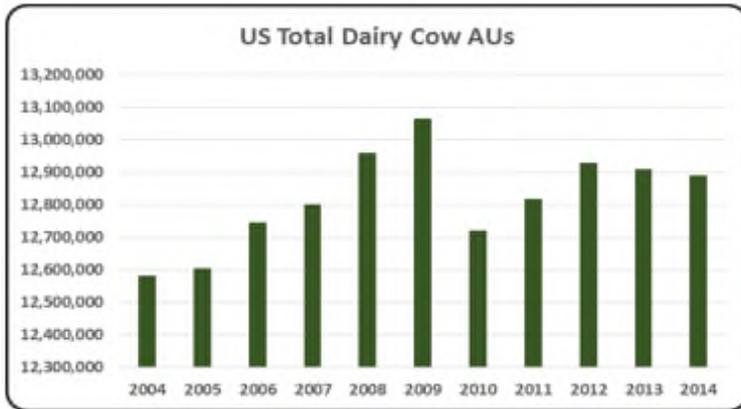
- There were 1,102.9 thousand AUs in Wyoming in 2014 representing less than 1% (0.93%) of all AUs in the U.S. Animal production in the state declined 7.7% year-over-year, and 9.0% from 2004 to 2014.



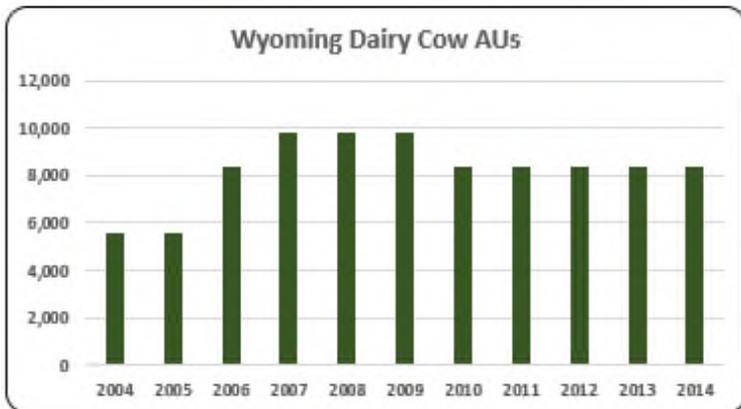
- U.S. broiler production is clustered in a number of states, with Georgia being the largest producer. On average from 2004 to 2014, broiler chicken AUs were about 26.1 million. In 2014, AUs rebounded 1% from the low AUs numbers in 2012 (25.4 million AUs).
- The average number of broiler AUs in Wyoming was 16,525 during last decade. Broiler production fell 7.5% in 2014 (16,268 broiler AUs) from 2004.
- On average, the layer AUs during 2004-2014 were 1.4 million. In 2014 layer AUs were 1.5 million, up 7% from the lowest number in 2009 (1.4 million AUs).
- Layer production represented only 0.22% (2,421 layer AUs) of all animal production in the state in 2014.



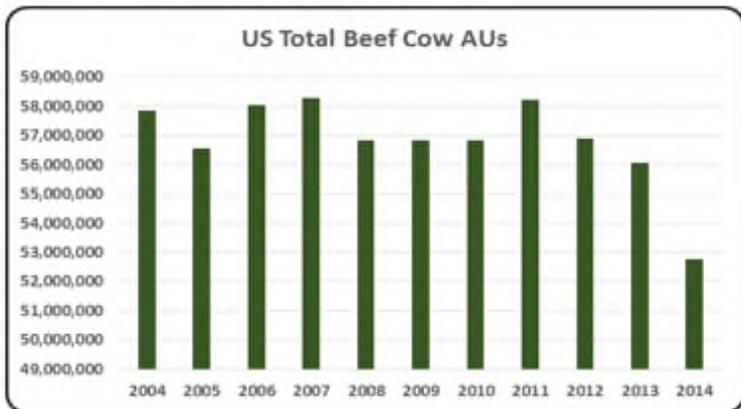
- From 2004 to 2014, the U.S. accounted for 50% of the world’s turkey production. However, in 2014 turkey AUs were the lowest of the decade at 3.5 million, decreasing 13% compared to 2008 (4.1 million turkey AUs) the largest turkey AUs of the decade.
- There were 4,439 turkey AUs in 2014. Turkey production increased 4.4% in 2014 relative to 2013, but turkey production stayed 13.0% below 2012 (5,095 turkey AUs.).
- On average from 2004 to 2014, hog AUs were about 21.4 million. In 2013 hog AUs reached a high of 23.2 million AUs as prices of main feed ingredients, particularly corn, decreased to pre-2010 price levels. Hog AUs in 2014 decreased 4.4% to 22.3 million AUs year-over-year, primarily due to the porcine epidemic diarrhea virus (PEDv) outbreak. Despite the fluctuation in AUs, the pork supply was relatively stable.
- Hog production averaged 88,351 hog AUs during the 2004-2014 decade. 2014 hog production (115,050 hog AUs) was 104.8% above 2004 hog production (56,175 hog AUs).



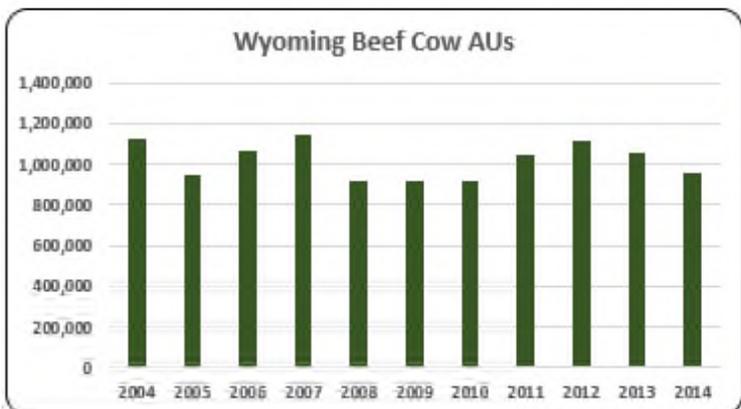
- From 2004 to 2014 dairy cow AUs averaged 12.8 million. In 2014, dairy cow AUs (12.9 million) remained about the same as the previous year but still below the high of 13.1 million AUs, the level in 2009. Despite the fluctuation in AUs, milk supplied has steadily risen.



- Wyoming 2014 dairy cow production rose 50.0% to 8,400 compared to 2004 production (5,600 hog AUs).



- From 2004 to 2014 beef cow AUs averaged 56.8 million. In 2014 beef cow AUs decreased to 52.8 million, the lowest of the decade. States that raise a large number of cattle and calves like Texas and Oklahoma were plagued with drought conditions during 2014.



- Beef cow production accounted for 86.71% (956,325 beef cow AUs) of all animal production in Wyoming in 2014, but beef cow AUs in 2014 were down 9.2% relative to 2013.

Wyoming Additional Information and Methodology

Animal agriculture is an important part of Wyoming's current and future economic health. To quantify the connection between animal agriculture and local economies, the United Soybean Board commissioned [Decision Innovation Solutions](#), an economic research firm in Urbandale, Iowa, to conduct an in-depth analysis of several aspects of animal agriculture. This analysis includes the following components:

- Economic impact of animal agriculture to local (state) economies during the 2004-2014 time period
- Soybean meal usage by animal species during the 2013/14 soybean marketing year
- Animal Unit (AU) trends from 2004-2014

Given the long-term presence of animal agriculture in Wyoming, of interest is the degree to which the industry impacts the Wyoming economy. Estimates of output, jobs, earnings, taxes paid, and multipliers for Wyoming animal agriculture are presented in this report. Methodology for this section of the report closely mirrors that followed in years' past. Also presented are estimates of the change in how animal agriculture has impacted Wyoming's economy over the last decade. Differences, to the extent they are present, are noted within the larger national report which accompanies this state report.

As with any industry across the economic spectrum, there are ebbs and flows in activity that have implications for other parts of the economy. Again using the same 2004-2014 time period as with the economic impact section of this state report, the "Animal Unit Trends" seeks to quantify production changes in animal agriculture in Wyoming which have occurred. As shown in this state report, Wyoming has seen changes within its animal agriculture industry. Expectations are that animal agriculture will continue to evolve over the next decade.

Animal agriculture is the single largest user of soybean meal in Wyoming. Through in-depth conversations with many of the nation's top nutritionists and researchers, "bottom up" estimates of soybean meal usage by animal type were determined. Using the input from these conversations and additional analysis performed by Decision Innovation Solutions, the quantity of soybean meal used during the 2013-14 soybean marketing year for up to sixteen specific animal species has been estimated.

Should readers have comments or questions regarding methodology, results and interpretation, please contact the authors at info@decision-innovation.com or 515.257.6077.

Wyoming Multipliers

Economic multipliers give a sense for how economic activity in a given industry is related to other industries in the same study area. To estimate the impact of animal agriculture on Wyoming's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis for cattle ranching and farming, dairy cattle and milk production, poultry and egg production, and other animal production (primarily hogs and pigs), where applicable.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. Referring to the multipliers below, for every million dollars in output generated by the various segments of animal agriculture in Wyoming, \$1.511 to \$2.463 million in total economic activity, \$0.230 to \$0.370 in household wages and 7 to 12 additional jobs are generated in the economy at large.

| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) |
|---------------------|-----------------------|------------|---------------|-------------------|
| RIMS II Multipliers | Cattle and Calves | \$ 2.4625 | \$ 0.3699 | 11.7 |
| | Hogs, Pigs, and Other | \$ 1.6449 | \$ 0.2570 | 8.2 |
| | Poultry and Eggs | \$ 1.5105 | \$ 0.2304 | 6.5 |
| | Dairy | \$ 1.6763 | \$ 0.2731 | 9.0 |

Appendix

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | |
|--------------------------------------|------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|
| Animal Units (AUs) | Beef Cattle AUs | 1,127,850 | 942,900 | 1,069,200 | 1,147,050 | 912,600 | 912,600 | 912,600 | 1,045,200 | 1,110,600 | 1,053,225 | 956,325 |
| | Hog and Pig AUs | 56,175 | 57,045 | 54,765 | 70,560 | 95,220 | 87,450 | 97,500 | 113,550 | 114,750 | 109,800 | 115,050 |
| | Broiler AUs | 17,584 | 17,214 | 17,097 | 17,858 | 17,580 | 16,345 | 16,565 | 12,482 | 16,418 | 16,361 | 16,268 |
| | Turkey AUs | 3,023 | 3,100 | 3,368 | 3,603 | 2,880 | 2,821 | 2,939 | 2,991 | 5,095 | 4,250 | 4,439 |
| | Egg Layer AUs | 2,140 | 2,357 | 2,274 | 2,161 | 2,099 | 1,836 | 1,824 | 1,834 | 2,346 | 2,383 | 2,421 |
| | Dairy AUs | 5,600 | 5,600 | 8,400 | 9,800 | 9,800 | 9,800 | 8,400 | 8,400 | 8,400 | 8,400 | 8,400 |
| | Total Animal Units | 1,212,371 | 1,028,215 | 1,155,105 | 1,251,032 | 1,040,179 | 1,030,852 | 1,039,827 | 1,184,457 | 1,257,609 | 1,194,418 | 1,102,902 |
| Value of Production (\$1,000) | Cattle and Calves (\$1,000) | \$ 556,374 | \$ 566,158 | \$ 525,294 | \$ 436,790 | \$ 462,933 | \$ 404,132 | \$ 495,666 | \$ 603,619 | \$ 618,850 | \$ 698,529 | \$ 937,083 |
| | Hogs and Pigs (\$1,000) | \$ 28,508 | \$ 27,685 | \$ 28,083 | \$ 40,614 | \$ 60,704 | \$ 50,231 | \$ 71,259 | \$ 118,416 | \$ 103,837 | \$ 76,255 | \$ 87,032 |
| | Broilers (\$1,000) | \$ 14,789 | \$ 14,009 | \$ 10,826 | \$ 13,434 | \$ 13,826 | \$ 11,976 | \$ 12,606 | \$ 11,106 | \$ 16,355 | \$ 19,925 | \$ 20,902 |
| | Turkeys (\$1,000) | \$ 2,805 | \$ 2,974 | \$ 3,515 | \$ 4,156 | \$ 3,890 | \$ 2,609 | \$ 3,495 | \$ 3,920 | \$ 7,389 | \$ 4,866 | \$ 8,147 |
| | Eggs (\$1,000) | \$ 182 | \$ 119 | \$ 138 | \$ 242 | \$ 193 | \$ 134 | \$ 167 | \$ 175 | \$ 190 | \$ 184 | \$ 186 |
| | Milk (\$1,000) | \$ 10,017 | \$ 10,789 | \$ 15,104 | \$ 24,735 | \$ 23,612 | \$ 14,449 | \$ 19,866 | \$ 24,128 | \$ 23,417 | \$ 25,768 | \$ 30,303 |
| | Other | \$ 34,302 | \$ 37,264 | \$ 34,783 | \$ 32,103 | \$ 31,376 | \$ 32,136 | \$ 34,184 | \$ 31,733 | \$ 31,232 | \$ 30,732 | \$ 30,231 |
| | Sheep and Lambs (\$1,000) | \$ 34,092 | \$ 37,055 | \$ 34,575 | \$ 31,896 | \$ 31,170 | \$ 31,931 | \$ 33,981 | \$ 31,531 | \$ 31,031 | \$ 30,532 | \$ 30,032 |
| | Aquaculture (\$1,000) | \$ 210 | \$ 209 | \$ 208 | \$ 207 | \$ 206 | \$ 205 | \$ 203 | \$ 202 | \$ 201 | \$ 200 | \$ 199 |
| | Total (\$1,000) | \$ 646,977 | \$ 658,998 | \$ 617,743 | \$ 552,074 | \$ 596,534 | \$ 515,667 | \$ 637,243 | \$ 793,097 | \$ 801,271 | \$ 856,258 | \$ 1,113,884 |

| Ag Census Data Category | Animal Type | 1997 | 2002 | 2007 | 2012 | |
|--------------------------|--|--------------------|----------------|----------------|------------------|---------|
| Number of Farms by NAICS | Beef cattle ranching and farming (112111) | 5,236 | 4,290 | 3,910 | 4,365 | |
| | Cattle feedlots (112112) | 158 | 269 | 108 | 69 | |
| | Dairy cattle and milk production (11212) | 59 | 51 | 26 | 36 | |
| | Hog and pig farming (1122) | 74 | 61 | 133 | 96 | |
| | Poultry and egg production (1123) | 32 | 41 | 83 | 112 | |
| | Sheep and goat farming (1124) | 494 | 387 | 382 | 293 | |
| | Animal aquaculture and other animal production (1125,1129) | 942 | 1,891 | 3,264 | 3,140 | |
| Value of Sales (\$1,000) | Cattle and Calves | 604,793 | 643,123 | 801,833 | 1,101,195 | |
| | Hogs and Pigs | 24,088 | 23,057 | 41,923 | 35,101 | |
| | Poultry and Eggs | 238 | 663 | 997 | 602 | |
| | Milk and Other Dairy Products | 9,882 | 7,473 | 22,331 | 22,904 | |
| | Aquaculture | 317 | 3,213 | 7,157 | 5,586 | |
| | Other (calculated) | 84,231 | 48,582 | 69,487 | 67,202 | |
| | Total | 723,549 | 726,111 | 943,728 | 1,232,590 | |
| Input Purchases | Livestock and poultry purchased | (Farms) 4,279 | 3,673 | 3,493 | 4,349 | |
| | | \$1,000 | 180,847 | 199,326 | 215,888 | 316,034 |
| | Breeding livestock purchased | (Farms) <i>n/a</i> | 2,565 | 2,354 | 2,837 | |
| | | \$1,000 | <i>n/a</i> | 21,091 | 38,436 | 55,056 |
| | Other livestock and poultry purchased | (Farms) <i>n/a</i> | 1,747 | 1,803 | 2,260 | |
| | | \$1,000 | <i>n/a</i> | 178,035 | 177,453 | 260,977 |
| | Feed purchased | (Farms) 6,125 | 6,761 | 6,398 | 8,484 | |
| | | \$1,000 | 110,332 | 137,943 | 150,962 | 320,457 |

| | Animal Type | Output (\$1,000) | Earnings (\$1,000) | Employment (Jobs) | Taxes Paid (\$1,000) |
|---------------------------------|-----------------------------------|------------------|--------------------|-------------------|----------------------|
| 2014 Animal Agriculture | Cattle and Calves | \$ 2,307,567 | \$ 346,627 | 10,999 | \$ 70,469 |
| | Hogs, Pigs, and Other | \$ 192,886 | \$ 30,137 | 956 | \$ 6,127 |
| | Poultry and Eggs | \$ 44,160 | \$ 6,736 | 191 | \$ 1,369 |
| | Dairy | \$ 50,797 | \$ 8,276 | 272 | \$ 1,682 |
| | Total | \$ 2,595,409 | \$ 391,775 | 12,418 | \$ 79,648 |
| Change from 2004 to 2014 | Cattle and Calves | \$ 590,547 | \$ 88,708 | 2,815 | \$ 18,034 |
| | Hogs, Pigs, and Other | \$ 63,406 | \$ 9,907 | 314 | \$ 2,014 |
| | Poultry and Eggs | \$ 10,509 | \$ 1,603 | 45 | \$ 326 |
| | Dairy | \$ 29,753 | \$ 4,847 | 159 | \$ 985 |
| | Total | \$ 694,216 | \$ 105,065 | 3,334 | \$ 21,360 |
| | Animal Type | Output(\$) | Earnings (\$) | Employment (Jobs) | |
| RIMS II Multipliers | Cattle and Calves | \$ 2.4625 | \$ 0.3699 | 11.7 | |
| | Hogs, Pigs, and Other | \$ 1.6449 | \$ 0.2570 | 8.2 | |
| | Poultry and Eggs | \$ 1.5105 | \$ 0.2304 | 6.5 | |
| | Dairy | \$ 1.6763 | \$ 0.2731 | 9.0 | |
| Tax Rates | Federal effective income tax rate | | | | 12.7% |
| | Federal Social Security tax rate | | | | 7.7% |
| | State Effective Rate | | | | 0.0% |
| | Total | | | | 20.3% |

Sources: 1997, 2002, 2007 and 2012 Census of Agriculture, USDA/NASS Survey Data, RIMS II Multipliers (U.S. Bureau of Economic Analysis), Tax Policy Institute and Tax Foundation.

Methodology

Economic Impact Analysis

To estimate the impact of livestock production on the overall economy of any given geographic area, it is necessary to quantify the relationship between the livestock industry and each of the other major components of the area's economy. Input-output (I-O) models are commonly used for this purpose. To estimate the impact of animal agriculture on each study area's economy, we applied RIMS II multipliers from the Department of Commerce, Bureau of Economic Analysis.

RIMS II is based on BEA's 2002-benchmark I-O table and 2010 regional data. It is comprised of approximately 500 industries. The model traces the interactions among these industries so that the effect of a given level of output in one industry on all other industries can be measured. These measures take the form of multipliers or factors that can be applied to output measured in dollars. They indicate the total economic activity in the state associated with a dollar of sales in that industry. In addition to measuring the value of output, multipliers are also derived for measuring impacts on earnings and employment.

Multipliers are generally stated in the form of "per million dollars" of output. As it relates to this analysis, multipliers are stated as the activity related to every million dollars of economic output in animal agriculture. The employment multiplier is the number of total jobs in a study area associated with one million dollars of sales in that industry. This includes jobs not just in the cattle industry, for example, but jobs in feed, finance, insurance, grocery stores, retailing, transportation, housing, etc.

Given the complexity of tracing these effects throughout the economy, some simplification in methodology was required to keep the task manageable. The first simplifying step in constructing RIMS II was to collapse the nearly 1,200 industries identified in the Census Bureau's North American Industry Classification System (NAICS) to a smaller number of industries. For purposes of this analysis, unique multipliers are now available for four industries that include all livestock and poultry production:

- Cattle ranching and farming
- Dairy cattle and milk production
- Poultry and egg production
- Hogs, aquaculture, and other animal production

A second important step in estimating multipliers is in defining the geographic region of interest. The RIMS II model permits the region of examination to be as small as an individual

county or as large as a set of contiguous states (multipliers are no longer available for the nation as a whole). The choice of region can have an important effect on the outcome, depending on whether the associated industries are located within the region. Generally, the more broadly a region is defined, the greater the likelihood that associated industries are represented within the region and the larger the associated multipliers.

For this analysis, we have defined individual states as the regions of principal interest. While there are variations in the degree to which associated industries are represented (and, correspondingly, in the size of the multipliers), states are generally of sufficient size to capture most of the impact of livestock production within their borders. The tables below give a sense of the variability in multipliers among states and species.

The image contains four blurred tables, each representing multiplier data for a different species. Each table has columns for 'Output Multiplier', 'Earnings Multiplier', and 'Employment Multiplier' across various states. The first table is for Beef Cattle, the second for Pigs, the third for Poultry, and the fourth for Hogs. The data is too blurry to read, but the structure is consistent across all four tables.

The first table above summarizes the multipliers for beef cattle. Alaska, Hawaii, and the northeast and mid-Atlantic states have low multipliers due to either small size or low state output, so output multipliers ranged from about 1.4 in several states to more than 3.1 in Texas. Earnings multipliers were mostly within the 0.2-0.5 range. Employment multipliers were as low as 5.5 in Delaware and as high as 21 in Texas. This means, for example, that one million dollars of beef cattle output in Texas has an output multiplier of 3.139, and therefore is associated with \$3,139,000 of economic activity in that state. It also produces \$568,000 of household earnings and 21 jobs.

The second table summarizes the multipliers for dairy cattle and milk production. The highest output multipliers for dairy are around 2.1 for Missouri, and the lowest is 1.4 for Alaska. The average is 1.8. The average earnings multiplier is 0.30, but is as high as 0.37 for Texas. The employment multiplier ranges from 5.8 in Delaware to 14.7 in Missouri. The average employment multiplier is 10.1.

The third table summarizes the RIMS-II multipliers for poultry and egg production. Output multipliers range from 1.3 for several states to over 3.0 for Missouri, Indiana, Ohio, and Minnesota. The earnings multipliers range from 0.19 in Alaska to 0.55 in Missouri. The employment multiplier ranges from 5.2 in Alaska to 18.2 in Missouri.

Finally, the multipliers for Industry 112A00, “animal production, except cattle, poultry and eggs” (i.e. hogs and pigs and smaller sectors like aquaculture) are summarized in the fourth table. They average 2.0 for output, 0.35 for income, and 12.0 for employment.

The tables on the next two pages detail the multipliers for each industry and each state under study.

Table 4, Animal Agriculture Multipliers

| Multipliers - Beef Cows | | | |
|-------------------------|--------------|----------------|------------|
| | Output (\$M) | Earnings (\$M) | Employment |
| Alabama | 2.3029 | 0.3946 | 16.5592 |
| Alaska | 1.4262 | 0.2007 | 5.9691 |
| Arizona | 2.2614 | 0.3969 | 12.6156 |
| Arkansas | 2.6749 | 0.4379 | 18.396 |
| California | 2.1945 | 0.3947 | 9.4805 |
| Colorado | 3.0165 | 0.5418 | 20.136 |
| Connecticut | 1.466 | 0.2311 | 9.3833 |
| Delaware | 1.5226 | 0.2143 | 5.4809 |
| Florida | 1.9085 | 0.3369 | 10.1553 |
| Georgia | 2.1114 | 0.3735 | 10.638 |
| Hawaii | 1.8144 | 0.2993 | 11.6775 |
| Idaho | 2.6651 | 0.4392 | 12.887 |
| Illinois | 2.0389 | 0.3554 | 8.6007 |
| Indiana | 2.0091 | 0.3267 | 10.9164 |
| Iowa | 2.5588 | 0.4116 | 10.7781 |
| Kansas | 2.7957 | 0.4402 | 12.7265 |
| Kentucky | 2.9349 | 0.4914 | 15.62 |
| Louisiana | 2.0813 | 0.3536 | 12.9119 |
| Maine | 1.7291 | 0.2939 | 9.7781 |
| Maryland | 1.5372 | 0.2431 | 9.8038 |
| Massachusetts | 1.5067 | 0.2439 | 9.3657 |
| Michigan | 2.0306 | 0.3511 | 11.9199 |
| Minnesota | 3.0084 | 0.517 | 13.0345 |
| Mississippi | 2.3469 | 0.3829 | 12.1657 |
| Missouri | 2.9918 | 0.4972 | 19.9061 |
| Montana | 2.7533 | 0.4602 | 19.002 |
| Nebraska | 2.63 | 0.4178 | 10.9765 |
| Nevada | 1.9246 | 0.3066 | 12.5728 |
| New Hampshire | 1.5188 | 0.236 | 7.0795 |
| New Jersey | 1.599 | 0.2589 | 7.7831 |
| New Mexico | 2.5931 | 0.4234 | 12.3765 |
| New York | 1.5612 | 0.2423 | 7.9154 |
| North Carolina | 1.8813 | 0.3251 | 9.5604 |
| North Dakota | 2.7048 | 0.429 | 11.0528 |
| Ohio | 1.9816 | 0.3382 | 11.8531 |
| Oklahoma | 2.8531 | 0.4806 | 18.6706 |
| Oregon | 2.7686 | 0.4716 | 19.7524 |
| Pennsylvania | 1.8879 | 0.3216 | 12.3709 |
| Rhode Island | 1.4339 | 0.2202 | 6.7422 |
| South Carolina | 1.8565 | 0.313 | 13.3586 |
| South Dakota | 2.5444 | 0.4005 | 10.0465 |
| Tennessee | 2.0507 | 0.3423 | 10.1339 |
| Texas | 3.1386 | 0.5681 | 21.0255 |
| Utah | 2.5486 | 0.4491 | 14.565 |
| Vermont | 1.9791 | 0.3202 | 12.216 |
| Virginia | 1.7572 | 0.2782 | 8.4306 |
| Washington | 2.3309 | 0.4005 | 11.2549 |
| West Virginia | 1.8944 | 0.2893 | 9.1247 |
| Wisconsin | 2.5005 | 0.4293 | 16.4265 |
| Wyoming | 2.4625 | 0.3699 | 11.7377 |

| Multipliers - Dairy Cows | | | |
|--------------------------|--------------|----------------|------------|
| | Output (\$M) | Earnings (\$M) | Employment |
| Alabama | 2.1198 | 0.3901 | 16.8279 |
| Alaska | 1.4124 | 0.2176 | 6.8576 |
| Arizona | 1.8469 | 0.3519 | 12.4536 |
| Arkansas | 2.1854 | 0.3869 | 16.2501 |
| California | 2.1052 | 0.4057 | 9.8255 |
| Colorado | 2.2912 | 0.4413 | 15.9998 |
| Connecticut | 1.5174 | 0.265 | 11.9182 |
| Delaware | 1.6241 | 0.2502 | 6.6257 |
| Florida | 1.8672 | 0.3579 | 11.0899 |
| Georgia | 2.2599 | 0.43 | 11.4771 |
| Hawaii | 1.6673 | 0.2992 | 12.4446 |
| Idaho | 2.1051 | 0.3738 | 10.8248 |
| Illinois | 2.2695 | 0.4277 | 10.6886 |
| Indiana | 2.1426 | 0.3807 | 12.0348 |
| Iowa | 2.0851 | 0.3604 | 9.4993 |
| Kansas | 2.2072 | 0.3727 | 11.4247 |
| Kentucky | 2.3534 | 0.4203 | 13.3419 |
| Louisiana | 2.0414 | 0.3743 | 15.7266 |
| Maine | 1.7875 | 0.3288 | 14.2153 |
| Maryland | 1.6128 | 0.2809 | 12.3871 |
| Massachusetts | 1.5341 | 0.2732 | 11.8712 |
| Michigan | 1.8996 | 0.3563 | 11.914 |
| Minnesota | 2.3844 | 0.4375 | 10.9672 |
| Mississippi | 2.1056 | 0.3707 | 12.4476 |
| Missouri | 2.424 | 0.4296 | 17.5814 |
| Montana | 2.0959 | 0.3748 | 15.9244 |
| Nebraska | 2.0794 | 0.3536 | 9.3333 |
| Nevada | 1.6272 | 0.2831 | 10.0807 |
| New Hampshire | 1.5822 | 0.2717 | 8.3891 |
| New Jersey | 1.68 | 0.2972 | 10.7516 |
| New Mexico | 1.8619 | 0.3283 | 9.2626 |
| New York | 1.6107 | 0.2754 | 9.1192 |
| North Carolina | 2.1096 | 0.3952 | 10.9487 |
| North Dakota | 2.1195 | 0.3594 | 9.4065 |
| Ohio | 2.2089 | 0.4107 | 13.8711 |
| Oklahoma | 2.234 | 0.4023 | 16.5432 |
| Oregon | 2.0373 | 0.3749 | 15.4182 |
| Pennsylvania | 2.032 | 0.3764 | 15.117 |
| Rhode Island | 1.4477 | 0.2461 | 7.9329 |
| South Carolina | 1.8338 | 0.3363 | 15.3084 |
| South Dakota | 1.9886 | 0.3326 | 8.5115 |
| Tennessee | 1.9108 | 0.3485 | 10.4587 |
| Texas | 2.3764 | 0.4584 | 17.7326 |
| Utah | 2.2084 | 0.4179 | 13.3973 |
| Vermont | 1.8522 | 0.3218 | 13.2072 |
| Virginia | 1.767 | 0.3089 | 9.4569 |
| Washington | 2.1432 | 0.3972 | 10.5501 |
| West Virginia | 1.5631 | 0.2626 | 8.6461 |
| Wisconsin | 2.1457 | 0.3984 | 15.7242 |
| Wyoming | 1.6763 | 0.2731 | 8.9668 |

| Multipliers – Hogs and Other Livestock | | | |
|--|--------------|----------------|------------|
| | Output (\$M) | Earnings (\$M) | Employment |
| Alabama | 1.8562 | 0.329 | 13.9097 |
| Alaska | 1.3594 | 0.2007 | 8.6563 |
| Arizona | 1.6584 | 0.3016 | 10.4456 |
| Arkansas | 1.945 | 0.3317 | 11.776 |
| California | 1.7903 | 0.3312 | 7.936 |
| Colorado | 2.0022 | 0.3696 | 13.6659 |
| Connecticut | 1.4084 | 0.2336 | 8.1469 |
| Delaware | 1.4708 | 0.2192 | 5.767 |
| Florida | 1.6574 | 0.3033 | 9.6891 |
| Georgia | 1.8604 | 0.3395 | 9.5701 |
| Hawaii | 1.5492 | 0.2665 | 9.0713 |
| Idaho | 1.8881 | 0.3235 | 9.8442 |
| Illinois | 2.0307 | 0.3673 | 8.6241 |
| Indiana | 1.9255 | 0.3293 | 10.2304 |
| Iowa | 1.8743 | 0.314 | 8.1777 |
| Kansas | 1.9551 | 0.319 | 10.0929 |
| Kentucky | 2.0807 | 0.3604 | 11.3139 |
| Louisiana | 1.7873 | 0.315 | 10.3488 |
| Maine | 1.6704 | 0.2953 | 11.3439 |
| Maryland | 1.4744 | 0.2457 | 10.2736 |
| Massachusetts | 1.4366 | 0.243 | 9.4901 |
| Michigan | 1.7629 | 0.3154 | 10.3928 |
| Minnesota | 2.0874 | 0.3674 | 9.1359 |
| Mississippi | 1.9144 | 0.3273 | 10.5694 |
| Missouri | 2.1228 | 0.3638 | 14.7387 |
| Montana | 1.8991 | 0.3283 | 14.4319 |
| Nebraska | 1.8633 | 0.3068 | 7.9506 |
| Nevada | 1.4829 | 0.2465 | 8.3478 |
| New Hampshire | 1.4512 | 0.2373 | 7.1097 |
| New Jersey | 1.5305 | 0.2589 | 10.0769 |
| New Mexico | 1.651 | 0.2815 | 7.8958 |
| New York | 1.4604 | 0.2387 | 6.6824 |
| North Carolina | 1.9048 | 0.3423 | 9.095 |
| North Dakota | 1.8966 | 0.3107 | 7.9587 |
| Ohio | 1.9492 | 0.3476 | 11.5645 |
| Oklahoma | 1.9952 | 0.3466 | 14.0359 |
| Oregon | 1.772 | 0.3131 | 13.3307 |
| Pennsylvania | 1.7734 | 0.3144 | 12.4363 |
| Rhode Island | 1.3694 | 0.2223 | 9.8974 |
| South Carolina | 1.6738 | 0.2942 | 12.7923 |
| South Dakota | 1.7946 | 0.2909 | 7.2931 |
| Tennessee | 1.6837 | 0.2936 | 8.6565 |
| Texas | 2.0056 | 0.3722 | 14.1968 |
| Utah | 1.9878 | 0.3603 | 11.4062 |
| Vermont | 1.6098 | 0.2706 | 11.2229 |
| Virginia | 1.5779 | 0.2642 | 7.9332 |
| Washington | 1.8517 | 0.3296 | 8.8636 |
| West Virginia | 1.4507 | 0.2337 | 7.3714 |
| Wisconsin | 1.8822 | 0.3359 | 12.7105 |
| Wyoming | 1.6449 | 0.257 | 8.1533 |

| Multipliers – Poultry | | | |
|-----------------------|--------------|----------------|------------|
| | Output (\$M) | Earnings (\$M) | Employment |
| Alabama | 2.5586 | 0.4444 | 14.9378 |
| Alaska | 1.3311 | 0.1915 | 5.1926 |
| Arizona | 1.5982 | 0.2825 | 7.5313 |
| Arkansas | 2.9362 | 0.4927 | 15.2358 |
| California | 2.1101 | 0.382 | 8.3929 |
| Colorado | 2.413 | 0.4454 | 13.8029 |
| Connecticut | 1.487 | 0.2412 | 7.7616 |
| Delaware | 1.9962 | 0.2869 | 6.5573 |
| Florida | 1.6752 | 0.2965 | 7.8389 |
| Georgia | 2.7687 | 0.502 | 11.9087 |
| Hawaii | 1.4285 | 0.2346 | 8.9534 |
| Idaho | 2.3648 | 0.3974 | 11.2945 |
| Illinois | 2.9018 | 0.5291 | 11.6996 |
| Indiana | 3.081 | 0.5259 | 15.1574 |
| Iowa | 2.8151 | 0.4573 | 11.2564 |
| Kansas | 2.5248 | 0.4033 | 9.8105 |
| Kentucky | 3.0937 | 0.5229 | 14.7436 |
| Louisiana | 2.4531 | 0.4273 | 13.4243 |
| Maine | 1.9039 | 0.3301 | 11.9345 |
| Maryland | 1.8751 | 0.3067 | 10.618 |
| Massachusetts | 1.5202 | 0.2518 | 8.4977 |
| Michigan | 1.9502 | 0.3468 | 9.791 |
| Minnesota | 3.1176 | 0.5464 | 12.7993 |
| Mississippi | 2.8654 | 0.479 | 14.0365 |
| Missouri | 3.2406 | 0.5485 | 18.1739 |
| Montana | 2.195 | 0.3698 | 11.5062 |
| Nebraska | 2.5575 | 0.4074 | 10.209 |
| Nevada | 1.4012 | 0.2268 | 6.3028 |
| New Hampshire | 1.5349 | 0.2461 | 6.4807 |
| New Jersey | 1.7084 | 0.2867 | 8.4276 |
| New Mexico | 1.7949 | 0.296 | 7.7868 |
| New York | 1.564 | 0.2477 | 6.7147 |
| North Carolina | 2.8143 | 0.5044 | 12.4235 |
| North Dakota | 2.4467 | 0.3877 | 9.5476 |
| Ohio | 3.0419 | 0.545 | 15.4365 |
| Oklahoma | 2.8729 | 0.4924 | 16.4373 |
| Oregon | 1.9896 | 0.3447 | 11.6219 |
| Pennsylvania | 2.4403 | 0.4351 | 13.6692 |
| Rhode Island | 1.395 | 0.22 | 6.0035 |
| South Carolina | 2.0926 | 0.3601 | 13.1457 |
| South Dakota | 2.5893 | 0.4006 | 9.6343 |
| Tennessee | 2.3871 | 0.4133 | 10.8298 |
| Texas | 2.6767 | 0.4942 | 15.5436 |
| Utah | 2.3408 | 0.4249 | 14.2571 |
| Vermont | 1.831 | 0.2943 | 10.5963 |
| Virginia | 2.1194 | 0.3536 | 9.2681 |
| Washington | 2.3539 | 0.4136 | 10.4814 |
| West Virginia | 1.6513 | 0.2597 | 7.3745 |
| Wisconsin | 2.5797 | 0.4578 | 15.2158 |
| Wyoming | 1.5105 | 0.2304 | 6.5244 |

Animal Unit Trends

Animal units (AUs) allow equal standards for all animal based on size and manure produced. The AUs in the Figures are based on the prevailing concept of an AU being one 1000 pound beef cow consuming an average of 2.6% of its body weight daily, however, daily consumption varies throughout the year. Other species are calculated as 0.1 AU per 100 pounds of body weight (e.g., a 450 pound sow =0.425 AU). See Table 2 for AUs description for all the species included in this study.

U.S. “Total” AUs Figure summarizes the AUs for the following species: dairy cows, beef cows, hogs, broilers, layers, and turkeys. Overall AUs have varied throughout 2004 to 2014, as different factors such as the weather, the economy, regulations and animal illnesses, among others, impact animal production. In 2014 AUs were all time low reflecting in part the impact of severe weather on cattle production in some part of country.

In general, all animal unit (AU) trend data were retrieved from the same sources as listed in the soybean meal consumption section. Below is a brief summary of sources for data which were conducive to analyzing AU trends (companion animals and aquaculture are not included in this component of the analysis). AU conversions were made according to factors in Table 5:

- Broilers Poultry – Production and Value, Summary annual reports (USDA)
- Layers Average layers from December Chicken and Eggs reports (USDA)
- Turkeys Poultry – Production and Value, Summary annual reports (USDA)
- Hogs Meat Animal Production, Disposition, and Income Summary annual reports (USDA)
- Dairy Cows Average January dairy inventory from QuickStats (USDA’s online query tool)
- Beef Cows Meat Animal Production, Disposition, and Income Summary annual reports (USDA)

Table 5, Animal Unit Factors

| Equivalent Animal Units Based on Live Weights | | | |
|---|--------------|------------------------------|---|
| Animal Type | Animal Name | Average Live Weight (pounds) | Animal Unit (One animal unit is 1,000 pounds live weight) |
| Hogs | Nursery Pigs | 20 | 0.020 |
| | Finishers | 150 | 0.150 |
| | Sows | 425 | 0.425 |
| Beef | Beef Calves | 450 | 0.450 |
| | Beef Cattle | 1,200 | 1.200 |
| Dairy | Dairy Cattle | 1,400 | 1.400 |
| Chickens | Broilers | 3.0 | 0.003 |
| | Layers | 3.5 | 0.004 |
| Other | Turkeys | 15.0 | 0.015 |
| Notes: Sows were given the same factor as "breeding/gestation sows." Beef cattle were given the same factor as "mature cows (beef)" | | | |
| Source: USDA, data provided by the Indiana Department of Environmental Management (IDEM). | | | |

Animal Agriculture Soybean Meal Use

One of the primary objectives of this analysis has been to estimate soybean meal use by animal species by life stage (as appropriate) by state and region. Efforts to ascertain soybean meal use in this fashion have been undertaken in the past. However, the methodology we utilized differs in some ways. In general, our approach to estimating soybean meal use starts from the very beginning of the protein production cycle. Rather than beginning with the end (pounds of meat or eggs produced), we focus on the appropriate rations fed to the many segments of animal agriculture, essentially employing a bottom up approach to estimating soybean meal usage by animal agriculture segments.

To better understand the current state of the soybean meal feeding industry, we made targeted contact with nearly thirty industry and university nutritionists and subject matter experts (collectively referred to herein as SME's) who have many years of practical industry experience (see Appendix B for a complete list of SME's). In our discussions with these SME's, we sought to understand the following for each of the animal species under study:

1. **Population** by state/region
 - a. Broken out by stage of life, as appropriate
 - b. Relevant production and practice trends taking place
 - i. Recognition and identification of geographic shifts in production areas taking place as part of a mid- to longer-term trend
 - ii. An understanding of "best management practices" with regard to rations that may be changing in a way that has implications for overall demand for soybean meal and its substitutes
2. **Typical ration ingredients and associated inclusion rates**
 - a. Regional differences in production practices and ration ingredient availability and their impact on rations
 - b. Characteristic(s) of soybean meal that make it attractive for feeding
 - c. An understanding of the nutritional profiles of competing substitutes to soybean meal, particularly the traits that give rise to effectively competing with soybean meal

The above outline was used to collect notes in numerous phone, web conference, and email conversations with our chosen SME's. As we discussed the above with SME's, specific conditions unique to some species were identified and incorporated in our estimates of soybean meal use. Further considerations were made for converting livestock and other species production data (which tend to be on calendar year) to a soybean marketing year so as to paint a more accurate picture with regard to the production and marketing of soybeans. What follows is an explanation of the approach we took to estimate soybean meal use by species.

Broilers

To estimate soybean meal usage for broilers we adopted the following methodology:

1. Broiler production and slaughter numbers are available in monthly and/or annual reports produced by USDA/NASS for nineteen major broiler producing states. While this covers a majority of the annual production, the reports do not provide a sound basis for distributing the “Other States” data. Using publically available data and internally developed methodology and resources we allocated the “Other States” data to the “missing” states.
2. Distribution of broiler production by target weight needs to account for varying finishing weights. Broilers are typically raised to one of 4 target weight ranges. Since the grow-out period and resulting feed consumption is different for each range it is important to estimate the number of birds grown to each target weight.
3. Converted annual 2013 and 2014 broiler production data to 2013/14 soybean marketing year.
4. Worked with Justin Fowler (University of Georgia) to determine two regional diets (northern and southern) for six pound finishing weight broilers.
 - a. Adapted the diet to various finishing weights.
5. Summarized soybean meal and other ration ingredient quantities by state and region.

Layers

To estimate soybean meal usage for layers we adopted the following methodology:

1. Recognize that there are four general types of layers to account for the feeding of soybean meal to, each of which has differing nutritional requirements and feed intake. These types of layers are:
 - a. Table egg layers
 - i. Layers that lay eggs for table egg consumption
 - b. Table egg layer pullets
 - i. Pullets ages 0-18 weeks of age that will become table egg layers
 - c. Breeder table layers
 - i. Laying hens that lay eggs which become table egg pullets
 - d. Breeder broiler layers
 - i. Laying hens that lay eggs which become broiler pullets
2. Obtained 2013 and 2014 monthly table egg layer data from the “Chicken and Eggs 2014 Summary” report from USDA, which contains inventory estimates by state for table and broiler layers. This report was used as the basis for estimating all four types of layers.
3. Worked with three regional nutritionists to estimate soybean meal consumption by type of layer.

4. Summarized soybean meal and other ration ingredient quantities by state and region.

Turkeys

To estimate soybean meal usage for turkeys we adopted the following methodology:

1. Obtained 2014 turkey production from the “Poultry – Production and Value, 2014 Summary” report. This report includes data for nineteen major turkey producing states. While this covers a majority of the annual production, the reports do not provide a sound basis for distributing the “Other States” data. Using publically available data and internally developed methodology and resources we allocated the “Other States” data to the “missing” states.
2. Turkey production data are already reported on the same timeframe as the soybean marketing year (September to August of following year), so a conversion was not necessary.
3. Worked with Jim Mitchell, a private turkey nutritionist, to determine a composite ration based upon the following turkey production categories:
 - a. Toms
 - b. Light Hens
 - c. Heavy Hens
4. Summarized soybean meal and other ration ingredient quantities by state and region.

Hogs

To estimate soybean meal usage for hogs we adopted the following methodology:

1. Obtained 2013 and 2014 marketings data from the USDA’s “Meat Animal Production, Disposition, and Income 2014 Summary” report.
2. Converted 2013 and 2014 marketings data to 2013/14 soybean marketing year.
3. Worked with Jason Woodworth (K-State) to determine appropriate rations for the following hog life stages:
 - a. A composite Gestation/Lactation ration based upon two different sub-phases
 - b. A composite Nursery ration based upon three sub-different phases
 - c. A composite Grower/Finisher based upon six different sub-phases
4. Adapted hog inventory by weight and breeding stock data from USDA to coincide with corresponding rations provided by Jason Woodworth.
5. Summarized soybean meal and other ration ingredient quantities by state and region.

Dairy Cows

To estimate soybean meal usage for dairy cattle we adopted the following methodology:

1. Obtained monthly 2013 and 2014 inventory data by state from the USDA's QuickStats online query tool.
2. Calculated average inventory by state for months making up the 2013/14 soybean marketing year.
3. Worked with nutritionists to determine appropriate rations for lactating dairy cattle.
 - a. Due to the common practice of feeding soybean hulls to dairy cows, we have also estimated the use of this soy product. As such, all presentation of soybean meal figures in this report are inclusive of soybean hulls.
4. Summarized soybean meal and other ration ingredient quantities by state and region.

Beef Cows

To estimate soybean meal usage for beef cows we adopted the following methodology:

1. Obtained 2013 and 2014 marketings data from the USDA's "Meat Animal Production, Disposition, and Income 2014 Summary" report.
2. Converted 2013 and 2014 marketings data to 2013/14 soybean marketing year.
3. Worked with Daniel Loy (Iowa State University) and Karla Jenkins (University of Nebraska, Lincoln), as well as online resources from the University of Missouri and Kansas State University to determine appropriate rations for beef production
 - a. Creep feed for young calves at or around weaning time
 - b. Backgrounding diet for producing yearlings
 - c. Due to the common practice of feeding soybean hulls to beef cows, we have also estimated the use of this soy product. As such, all presentation of soybean meal figures in this report are inclusive of soybean hulls.
4. Summarized soybean meal and other ration ingredient quantities by state and region.

Aquaculture

The 2012 USDA Census of Agriculture provides information on the number of aquaculture operations by species within each state. This information was used to produce the USDA 2013 Census of Aquaculture (2013 Census). The 2013 Census provides sales information by sales dollars, head count and live weight for species of fish and crustacean's raised for food and/or distribution in the US.

The 4 major food fish included in this study are Catfish, Trout, Tilapia and Hybrid Striped Bass. Saltwater Shrimp and Freshwater Prawns are included in the Shrimp category.

In most categories of food fish species the sales information is reported in 4 life stage categories: Broodstock, Fingerlings & Fry, Stockers and Food Size. This breakdown is not available for Hybrid Striped Bass and it is not applicable to crustaceans.

For Trout and Catfish, the USDA also produces annual reports for the previous two years. The data included in these reports are very similar to the data included in the 2013 Census except they provide 2014 data on catfish and trout production. For all other species we established a growth percentage from 2013 to create the 2014 estimates. The 2014 populations for each species include an adjustment for losses through the specific life stage growth period.

Working with industry experts an average target weight, feed conversion ratios (FCR), and soybean meal inclusion rates were determined for each species (catfish, trout, Tilapia, Hybrid Striped Bass, and Shrimp). In addition, we created an estimate for the percent of death losses for each species. A loss factor was established based on the assumption that losses occur evenly over the grow-out period. These factors were used to calculate the estimated soybean meal consumption per head in each life stage category.

Trends in Aquaculture

Feeding

Due to the high cost and limited availability of fish meal the aquaculture industries have heavily invested in research on increasing inclusion rates for soybean meal and other soy products such as soy protein concentrate. Depending on the species there is a point where FCR and meat quality suffer. Advances in pre-treatment, feed pellet production, supplements, and feeding methods will continue the trend toward higher inclusion rates for soybean meal. (Tibbets, 2015).

Genetics

Recent work with trout to select and propagate fish with a higher tolerance for soybean meal has enabled producers to move from a 15% inclusion rate to a 20% inclusion rate. As these new trout become more available the average inclusion rate should increase.

Production

The Global Aquaculture Alliance has started the process of seeking approval for establishing coastal fish production in the Gulf of Mexico. This production method involves the installation of containment areas where fish are raised and harvested. The rations developed for this production method will include soybean meal. This production method is also being developed in the Northeast and Northwest coastal waters.

Companion Animals

Soybean meal usage by companion animals was greatly aided by the “2012 U.S. Pet Ownership and Demographics Sourcebook”, a report published by the American Veterinary Medical

Association. This document provided estimates of horses, cats and dogs per household for the year 2011 and estimates of total animal populations for the years 1996, 2001, 2006 and 2011. Data from this report was used as a basis to estimate companion animals by state for the year 2014. SME's provided understanding regarding the degree to which soybean meal is included in these companion animal diets. Following are additional details related to estimating soybean meal usage for each companion animal type.

Horses

To estimate soybean meal usage for horses we adopted the following methodology:

1. Using historical horse population data from the AVMA publication, 2014 estimated horse populations by state for were generated.
2. Worked with James Lattimer (K-State) to determine appropriate soybean meal inclusion rates for horses.
3. Average daily consumption of soybean meal was factored against total 2014 horse populations by state.

Dogs

To estimate soybean meal usage for dogs we adopted the following methodology:

1. Using historical dog population data from the AVMA publication, dog population by state estimates for 2014 were generated.
2. Worked with George Collings to determine appropriate soybean meal inclusion rates for dogs.
3. Contrary to estimates for cats, which are quite uniform in their weight and food consumption, dogs required additional considerations. Dogs weigh between 2-200 pounds and therefore have wide ranges of food requirements. Accounting for different sized dogs was addressed.
4. While estimates of total dogs was provided by AVMA, a breakdown by breed was not available. To better reflect the popularity of breeds of dogs, an exponential curve was estimated to give more popular breeds a higher weight (i.e., Labrador Retrievers are in higher number than Fox Terriers) for determining pet food consumption.
5. Average daily consumption of soybean meal by dogs is a function of dog weight (varies by breed), food intake (varies by breed), soybean meal inclusion rate and share of dog food market that utilizes soybean meal. This function yields an estimated 4.98 lbs of soybean meal per year per dog.
6. The above variables were factored against total estimated 2014 dog populations by state.

Cats

To estimate soybean meal usage for cats we adopted the following methodology:

1. Using historical cat population data from the AVMA publication, cat population by state estimates for 2014 were generated.
2. Worked with George Collings to determine appropriate soybean meal inclusion rates for cats.
3. Average daily consumption of soybean meal by cats is a function of cat weight, food intake, and soybean meal inclusion rate and share of cat food market that utilizes soybean meal. This function yields an estimated 0.8 lbs of soybean meal per year per cat.
4. The above variables were factored against total estimated 2014 cat populations by state.

Appendix A, Subject Matter Experts

| Full Name | Role | Company Name |
|--------------------------------|--|----------------------------------|
| Brian Faris, Ph.D. | Subject Matter Expert - Sheep & Meat Goats | Kansas State University |
| Carlos Campabadal Teran, Ph.D. | Subject Matter Expert - MultiSpecies | Kansas State University |
| Allen D. Davis, Ph.D. | Subject Matter Expert - Aquaculture | Auburn University |
| George Collings, Ph.D. | Subject Matter Expert - Pet Food | Collings Nutrition Solutions |
| Gregory Engelke | Subject Matter Expert - Poultry | Cornerstone Resources LLC |
| James Lattimer, Ph.D. | Subject Matter Expert - Equine | Kansas State University |
| Jason Woodworth, PhD | Subject Matter Expert - Swine | Kansas State University |
| Jeffre Firman, Ph.D. | Subject Matter Expert - Poultry | University of Missouri |
| Jim Mitchell, Ph.D. | Subject Matter Expert - Turkeys and Layers | Independent |
| Karla Jenkins | Subject Matter Expert - Beef | University of Nebraska - Lincoln |
| Kevin Fitzsimmons, Ph.D. | Subject Matter Expert - Aquaculture | The University of Arizona |
| Kevin Herrick, Ph.D. | Subject Matter Expert - Dairy | Purina Animal Nutrition LLC |
| Michael Brouk, Ph.D. | Subject Matter Expert - Dairy | Kansas State University |
| Sally Noll, Ph.D. | Subject Matter Expert - Poultry | University of Minnesota |
| Terry Hanson, Ph.D. | Subject Matter Expert - Aquaculture | Auburn University |
| Justin Fowler, Ph.D. | Subject Matter Expert - Broilers | University of Georgia |
| R Scott Beyer, Ph.D. | Subject Matter Expert - Broilers | Kansas State University |
| Wendy M Sealey, Ph.D. | Subject Matter Expert - Aquaculture | Bozeman Fish Technology Center |
| T. Gibson Gaylord, Ph.D. | Subject Matter Expert - Aquaculture | Bozeman Fish Technology Center |
| Rick Barrows, Ph.D. | Subject Matter Expert - Aquaculture | Bozeman Fish Technology Center |
| Shelia Lingle | Subject Matter Expert - Aquaculture | Indiana Soybean Alliance |
| Betsy Hart | Subject Matter Expert - Aquaculture | National Aquaculture Association |
| Brenda Matherly | Subject Matter Expert - Equine | Illinois Farm Bureau |
| Steven Hart, Ph.D. | Subject Matter Expert - Aquaculture | Global Aquaculture Alliance |
| Michael Hutjens, Ph.D. | Subject Matter Expert - Dairy | University of Illinois |
| Craig Browdy, Ph.D. | Subject Matter Expert - Aquaculture | Ziegler Feed |
| Randy MacMillan, Ph.D. | Subject Matter Expert - Aquaculture | Clear Springs Foods |
| James Drouillard, Ph.D. | Subject Matter Expert - Beef | Kansas State University |
| Daniel Loy, Ph.D. | Subject Matter Expert - Beef | Iowa State University |
| Monty Kerley, Ph.D. | Subject Matter Expert - Beef | University of Missouri |
| Tom Welch | Subject Matter Expert - Aquaculture | Ziegler Feed |