

Soybean Industry Scan for Connections 2010

Summary Report

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Introduction

In preparation for the Connections meeting in December 2010, Adayana conducted a high-level scan of the soybean industry to identify significant opportunities and challenges in the next 3-5 years. Adayana utilized secondary research from Soy 2020, additional existing USB analysis, and internal expertise from both USB staff and the Adayana team to outline the strategic opportunities and challenges for the industry in the following four categories:

- **Meal** - Any trends, situations, or applications that apply to soy meal
- **Oil** - Any trends, situations, or applications that apply to soy oil
- **Freedom to Operate** – Ensuring U.S. soybean farmers have the opportunity to continue producing soybeans
- **Distribution Channels** - Global transportation and logistics network

The purpose of the document is to provide initial insights and perspectives within each category for discussion at the Connections meeting. These areas of interests can help identify potential partnerships within the feed, food, industrial and energy markets to help in maximizing global utilization of United States soy.

If you are attending connections as an industry stakeholder, please review this document and consider the opportunities for your organization and others throughout the industry to partner with national and state soybean checkoff organizations to further leverage existing initiatives and resources. For USB and QSSB Board members and staff, please review this document to identify potential opportunities and challenges that should be pursued to improve the US soybean market and producer profitability through industry collaboration.



Meal

Top areas of interest for Meal over the next 3-5 years are:

- Value Added Meal
- Quality of U.S. Soy Meal
- Human Consumption
- Replacement for Nonrenewable Resources
- Possible Reduction in Animal Agriculture Production

Value Added Meal

Value added meal combines soy protein with additional enhancements that increase the value of soy meal for the end users by reducing production costs or increasing the value of the end product. From a future perspective, value added meal may be a direct result of breeding and biotechnology innovation, perhaps creating a soybean that contains specific output attributes that meet the needs of certain applications. In the 3-5 year timeframe, value added protein will likely be more focused on blended non-soy components with soy meal. Examples for enhancing meal through value could include:

- Increasing the available energy content of soy meal given that energy is a high value and expensive component of feed rations
- Creating soy meal that reduces phosphorus excretion by developing low phytate phosphorus soybeans which could further reduce eutrophication in lakes and streams from animal waste

The expansion of value added meal must be a collaborative effort amongst all segments of the soybean industry, in addition to partner industries (such as animal health companies in the example above) and soybean users. From a global perspective, the U.S. industry must define and market the differential advantage of U.S. soy meal for value added application versus other international suppliers. The soybean industry should also identify potential substitute feedstock (such as DDGS and canola) that could replace U.S.-based soy meal in potential value added applications and develop strategies to address the potential substitutions.

Quality of U.S. Soy Meal

Balancing the protein and oil compositional levels of U.S. soybeans will be critical to the success of the U.S. soybean industry in the next 3-5 years. Given that the level of oil and protein in soybeans generally occurs in an inverse relationship, the industry must find the appropriate balance between the two components such that value of the U.S. soybean is maximized. In the global marketplace, U.S. soybeans must remain competitive with other international suppliers (specifically South America) from a protein level perspective to maintain and/or grow exports. While the various compositional benefit of U.S. soybean's must continue to be communicated in the market, a drop in protein levels could trigger U.S. market share loss in multiple countries, resulting in lower demand for U.S. soybeans and negative implications for



the U.S. soybean farmer. The U.S. soybean industry must continue to monitor and proactively address concerns related to decreasing protein levels in U.S. soybeans. If a decrease in protein levels becomes a trend for the aggregate U.S. soybean supply, the entire soybean industry must collaborate to alter the current production system as no one single segment can drive a shift in protein levels. A significant drop in protein levels compared to international supply competitors could be a devastating blow to the entire U.S. soybean industry.

In addition to balancing protein and oil levels, the U.S. soybean industry must continue to improve the balance amino acid balance/composition of U.S. soy meal. The industry should continue identifying the benefits/disadvantages of specific amino acids in livestock feed applications as well as define the value created by those amino acids. As part of the global marketing strategy, the U.S. soybean industry must define the specific value of the amino acids in U.S. soy meal as a feedstock as an avenue for differentiation amongst global suppliers. The value of these benefits must be quantified on a consistent grading standard before the U.S. soy industry will benefit from amino acids benefits. The establishment of this standard may require an alternative compensation structure.

Human Food Consumption

Although much research has been conducted that proves the benefits of soy in human diets, consumer adoption of soy as a direct food ingredient has not expanded at the rate anticipated by many within the industry. One cause for this could be the detractors of soy as a food ingredient. While the fact is these studies exist today, they likely are not the primary reason why soy as a food ingredient has not accelerated as quickly as expected. Studies indicate the approximately 85% of consumers perceive soy as a healthy food ingredient. Another impediment to market growth is the flavor and palatability of soy-based foods, specifically in the U.S. From a global perspective, utilizing soy as a direct food ingredient will be a critical component to providing adequate protein consumption levels for a growing population. The U.S. soybean industry needs to work with global food manufacturers to identify opportunities and work to overcome the current challenges for increasing human consumption.

In addition to the opportunity to increase soy meal as a direct food ingredient, increasing consumer incomes globally will lead to a preference for animal protein. Given animal utilization is the biggest consumer of soybean meal and that soy is a predominant feedstock for livestock and poultry around the world, the U.S. soy industry must continue to identify opportunities for soy use as an value-added food ingredient through livestock and poultry consumption.

Replacement for Nonrenewable Resources

As the number of consumers desiring products derived from renewable resources continues to expand around the world, the U.S. soy industry must continue to find substitute applications for soybeans that replace components from nonrenewable resources. Consumers and



manufacturers alike will continue to desire products made with renewable resources as long as the products are competitive on value. Given the sheer size of the potential market and the ambiguity associated with new use applications, the U.S. soy industry must first prioritize the nonrenewable resources to target for soybeans to replace, and then conduct focused research on soybean applications. Given that the process from research to commercialization can take many years, the industry must prioritize the markets and begin research now to have success beyond 3-5 years.

Examples of soy replacement for nonrenewable resources the USB New Uses Committee is working on includes the following:

- Collaborating with the Ford Motor Company to research meal and flour uses as a filler material in parts as well as a replacement for carbon black in rubber material
- Identifying the potential for soy flour in various adhesives for wood working with companies such as Georgia Pacific, Ashland Chemical and Hexion
- Working with various organizations to convert soy protein and meal into fibers for various applications

Possible Reduction in Animal Agriculture Production

As the possibility exists for animal agriculture production to shrink in the U.S. due to global competitive disadvantage, the displacement of those beans currently used in domestic livestock feed applications could become a challenge for the U.S. soy industry. Should the situation occur, the U.S. soybean industry must be proactive to find new markets for the displaced soybeans. The U.S. soybean industry should also continue to identify collaborative strategies with the U.S. livestock sector to ensure maintained and/or growth of livestock production domestically. Soybeans fed to U.S. livestock will likely originate in the U.S., while soybeans used to feed livestock produced outside this country are likely to use whatever soybeans are cheapest and readily available, with the highest protein beans selected first.



Oil

Top areas of interest for Oil over the next 3-5 years are:

- Differentiating Soy Oil from Other Edible Oils
- Promoting the Benefits of Soy Oil
- Replacement for Nonrenewable Resources
- Biofuels Utilization

Differentiating Soy Oil from Other Edible Oils

The market for edible oils remains highly competitive due to the utilization of multiple feedstocks (such as palm and canola) that are often perceived as substitutes. To continue gaining market share and increasing the potential for future soy oil innovations, the U.S. soy industry must find ways to differentiate soy oil and define the value to users compared to other vegetable-based edible oil. Implementing this will require continued collaboration with the food processing and manufacturing industry. Until soy oil is differentiated in the market, food processors and manufacturers will continue to source oil based upon the lowest-cost option per output. Differentiation also establishes a foundation for the industry to capture value for future compositional enhancements to soy oil. Two specific examples are high oleic soy oil and the Omega 3 enhancement to soy oil. Combined with other innovations, these specific examples will create a significant marketing opportunity for the U.S. soybean industry, with the potential to further differentiate U.S. soy oil.

Promoting the Benefits of Soy Oil

A parallel need to differentiating edible soy oil is defining the various benefits of soy oil and promoting the benefits in both food and industrial uses. The U.S. soy industry must continue to research the long-term benefits of soy oil in human diets and industrial applications and clearly communicate these findings in order to create demand for soy oil. As part of this effort, the industry must define and communicate the “right soy oil for the right application.” Given that various oils exist and apply, the U.S. soy industry must also continue to find ways to build awareness of these benefits through the promotion of soy oils and the corresponding applications at the consumer, food industry and industrial level. In addition the U.S. soy industry must differentiate the multiple benefits generated by varying characteristics and/or traits (i.e. low-linolenic vs. high oleic) in specific applications. These activities will be crucial to compete against other oils.

Replacement for Nonrenewable Resources in Nonfuel Uses

As the number of consumers desiring products derived from renewable resources continues to expand around the world, the U.S. soy industry must continue to find substitute applications for soybeans that replace components from nonrenewable resources. One specific nonrenewable resource the U.S. soy industry should target is applications that utilize petroleum. Petroleum will continue to be a scrutinized resource; therefore, manufacturers will continue to desire a



substitute for petroleum that is derived from a renewable source. Given the sheer size of the potential market, the U.S. soy industry must first prioritize the petroleum applications to target for soybean oil replacement, and then conduct focused research on how to substitute soy oil for petroleum (an example of a soybean oil replacement project is the use of soy in paint coatings and wood stains). Given that the process from research to commercialization can take many years, the industry must prioritize the markets and begin research now to have success beyond 3-5 years.

Biofuels Utilization

The current challenges in the biodiesel industry created by the lack of support at the federal level for the blender's tax credit will serve as a risk for the U.S. soy industry. Economics will continue to be the key driver in biodiesel production as breakeven costs can vary significantly between operations. Although soy continues to be a preferred feedstock for biodiesel, the drastic decrease in biodiesel production over the past year, eliminates a utilization source of U.S. soybeans. Unless a shift occurs that reintroduces the blender's tax credit, biodiesel production will match Renewable Fuel Standards 2 output requirements, and the U.S. soy industry must find new markets for the displaced soybeans previously utilized in biodiesel production. Also, the biodiesel industry must continue to identify how to utilize renewable identification numbers (RINs) to price biodiesel. One potential new market for the biodiesel could be in the home heating oil market, a potential market for an estimated 450 million gallons of biodiesel.

One additional element of biofuels utilization is the ongoing "fuels versus food" debate. While discussions on the topic have minimized in the past 12-18 months, the potential for the debate to elevate once again is high given rising energy costs. The soybean industry must be prepared to reengage in those discussions and properly address concerns in the onset to avoid potential barriers in biodiesel production.



Freedom to Operate

Top areas of interest for Freedom to Operate over the next 3-5 years are:

- Defining Modern Agricultural Production
- Sustainability
- Adoption of Biotechnology Advancements
- Implications of the 2012 Farm Bill and Increased Government Regulations

Defining Modern Agricultural Production

With more consumers becoming less connected to agriculture and rural American than ever before, large, profitable agriculture operations continue to receive attention, often in negative context. The agriculture industry must continue to portray modern farmers as people who share their values and modern production agriculture by defining current production and management practices that are required to provide a safe and abundant food supply domestically. U.S. consumers most desire a safe, abundant and affordable food supply for their families, with less concern around feeding an increasing global population. The industry also needs to proactively share how agriculture production has evolved over time and the resulting current and future benefits. While this is no simple task, the challenges to the agriculture industry will only increase in the future if not addressed. Entire industry collaboration will be required to ensure long-term viability of the industry. The industry must become much more proactive than in the past about promoting modern agriculture practices.

Sustainability

While the definition of sustainability varies greatly, U.S. soybean farmers must continue to proactively define and promote sustainability as US consumers are concerned about environmental impact. Sustainable production practices will continue to be scrutinized by those in and outside the agriculture industry. Proactively promoting the crop nutrient sustainable benefits of soybean production will be necessary given so that the soybean industry can avoid this area becoming a challenge in the future.

Adoption of Biotechnology Advancements

With the biotechnology advancements in the pipeline well beyond 3-5 years from multiple agriculture biotechnology companies, the acceptance and adoption of these new biotechnology events around the world will be critical to the success of the entire U.S. soybean industry. The U.S. industry must collaborate to ensure that adoption and implementation of the biotechnology advancements occur from the farm through the end consumer. The window of advantage due to biotechnology adoption will be limited as other countries around the world will eventually adopt the new technology. No one segment in the industry can take on this task alone and a lack of adoption of these innovations could be detrimental to the entire industry. Additionally, the industry must continue to support biotechnology events domestically and globally to ensure the innovations can be implemented in the soybean production system.



Implications of the 2012 Farm Bill and Increased Government Regulations

Given that only very preliminary discussions have taken place to date related to the 2012 Farm Bill, predicting all the aspects of the program is an impossible task at this time. However, changes will most likely occur that will impact the soybean production throughout the U.S. The implications of these changes must be identified, and education on these topics must be provided to the industry.

Additionally, increasing government regulations will impact the entire soybean industry. Some of these regulatory areas include:

- Approval of biotechnology events, including gaining domestic and international market access
- Restrictions on financial hedging tools from financial reform regulation
- Changes to federal crop insurance programs
- Tax changes to estate planning



Distribution Channels

Top areas of interest for Distribution Channels over the next 3-5 years are:

- Infrastructure Limitations
- Identity Preserved System
- Accessing and Servicing New Markets
- Development of Global Competition

Infrastructure Limitations

The limitations on the current aging infrastructure system are creating bottlenecks and increasing costs for transporting soybeans. These limitations are occurring within the river transportation system, roadways, and the rail system. This challenge is likely to only expand in the next 3-5 years as these systems continue to deteriorate as a result of continued use and lack of maintenance/development investments. While certain production regions have enhanced transportation systems within the past 3-5 years, the national system continues to lack the investment required to meet the increasing number of bushels put through the system. This challenge is critical to the success of the U.S. soybean industry given the percentage of soybeans exported annually. If not addressed, the U.S. soy transportation system could become a competitive disadvantage compared to other international soybean suppliers. The industry must support initiatives to research and improve the current transportations infrastructure.

Identity Preserved System

Developing a broad-based Identity Preserved (IP) grain supply chain has been a challenge of the industry dating back many years. The absence of a consistent and effective IP system minimizes the potential for capturing the value associated with future soy output traits. While the commodity soybean will continue to dominate the soybean market over the next 3-5 years, defining a consistent IP system, particularly for emerging international markets, will be necessary to define in the near future.

Accessing and Servicing New Markets

As with all commodity markets, the current soybean market is faced with the challenge of continually creating new and relevant opportunities. The U.S. soybean industry must continue to expand into existing and emerging international markets utilizing the current attributes of U.S. soybeans as well as future biotechnology innovations that add value. The opportunity exists to define a strategy for both the commodity soybean market and the value added soybean market. The focus of these strategies should be on creating a competitive advantage for U.S. soybeans. The industry must continue to differentiate U.S. soybeans from other soybeans produced throughout the world by defining the compositional benefits and describing the future innovations that will improve the value of U.S. soybeans to users. As mentioned previously, two potential competitive disadvantages of growing demand of U.S. soybeans is if the domestic



infrastructure system continues to deteriorate and if protein levels decrease. The industry must continue identifying global trends that support the value of U.S. soybeans.

Development of Global Competition

The competitiveness of global soybean producers and country export capabilities is improving. In countries such as Brazil, foreign government agriculture policies have been modified to improve their producer competitiveness and drive toward an export market. Governments have also loosened foreign country capital investment in agriculture, and have even sold land to foreign countries for rapid importation of mechanization and agronomic expertise (as seen in Africa). As foreign government investment continues to improve agriculture productivity and food security, the US soybean industry will find increased competitiveness in international markets from global soybean producers.