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Grain Inspection, Packers and Stockyards Administration
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DISTILLERS GRAINS BACKGROUNDER

"Facilitating the Marketing of U.S. Distillers Grains: An Update in Response to a Resolution of the Grain Inspection Advisory Committee"

INTRODUCTION

In May 2004, the Grain Inspection, Packers and Stockyards Administration's (GIPSA) Grain Inspection Advisory Committee (Advisory Committee) recommended that GIPSA explore the ethanol industry's and end-users' needs for co-product marketing standards. In response to this recommendation, GIPSA's Market Analysis and Standards Branch (MASB) conducted a thorough literature review and gathered information from government and industry representatives, including processors, researchers, feedlot managers, and trade associations. MASB presented the findings of this research to the Advisory Committee in November 2004.

BACKGROUND

The U.S. fuel ethanol industry is growing at a record pace. Numerous Federal and state incentives, such as the clean burning fuel programs, have helped foster growth of more than 570 percent over the past 20 years. In 2004, high oil prices, a bumper corn crop, and limited processing capacity created new market opportunities and resulted in record production of more than 3.4 billion gallons of fuel ethanol. Today, ethanol represents the third largest market for U.S. corn. At this record pace, fuel ethanol production is positioning itself as an integral part of rural economic development, environmental improvement, and gasoline marketing.

Ethanol, also known as ethyl alcohol or grain alcohol, is made through fermentation and distillation of the starch found in crops such as corn, sorghum, potatoes, sugar cane, as well as in cornstalks. Ethanol is produced in either dry grind or wet mill facilities. The primary co-products generated from the wet mills or "corn refineries" include high fructose corn syrup, corn oil, gluten feed, and gluten meal. Co-products from the dry grind process include distillers grains and carbon dioxide. While both types of facilities have similar operating costs, the dry grind facilities are usually smaller and require a lower initial investment, making their capital costs two to four times less per gallon. Because dry grind facilities account for 67 percent of all ethanol facilities and make up the majority of the recent industry growth, MASB focused its research on the dry grind process and the major dry grind co-products, specifically distillers grains.

Distillers grains are marketed as three products: distillers wet grains (DWG) or wet cake; distillers dried grains (DDG); and distillers dried grains with solubles (DDGS), which includes some portion of the condensed distillers solubles (the condensed, thin stillage from the fermentation process). Dry grind plants can vary the production of wet and dry distillers grains,

depending on local demand, rail demand, natural gas prices, and U.S. Environmental Protection Agency standards. Today, DDGS accounts for more than half of the industry's volume. DWG is the second most prevalent form of distillers grains marketed. To arrive at a common denominator for forecasts, dry grind co-product volume and prices are expressed in DDGS equivalent.

In the past, distillers grains were viewed as a by-product of the dry grind ethanol process rather than a co-product, primarily due to the fact that ethanol sales make up over 80 percent of total revenues. However, the sales of these co-products are an important part of the total profitability. DDGS production is expected to double from 3.5 million metric tons in 2002 to over 7 million metric tons by 2006. Effective marketing of the co-products as animal feed will be essential to maintain the efficiency and profitability of the dry grind ethanol facilities.

Distillers grains are sold to the feed manufacturing industry as a protein product that can be used as either an energy source similar to grain or as a protein source to replace soybean meal. Distillers grains have been successfully used to feed ruminant animals (e.g., dairy and beef cattle) for over a century. Research comparing these products to other protein and energy feeds over the past 50 years has shown the value of distillers co-products. In recent years, an increasing amount of distillers grains have been used in the swine market, most likely due to aggressive initiatives from researchers and marketing groups to convince these nontraditional users that distillers grains can be a useful and economical feed ingredient.

There are several factors that determine the efficacy of using distillers grains as feed. The first major concern to end users is the variability in the quality of distillers grains from different suppliers and even in separate loads from the same supplier. The variation in the quality of the product is primarily due to the grain feedstock and processing methods. The co-products exhibit differences in nutrient composition, color, granulation, and flowability. Variation in nutritional value affects whether the DDG and DDGS will fit in a least-cost-ration formula and may influence whether it is purchased instead of other feed ingredients.

Grain quality is another consideration. The nutrient values of the co-products are only as good as the grain feedstock. The concentration that occurs during the dry grind process triples the nutrient content of the distillers grains compared to the incoming grain. This tripling effect also applies to harmful quality attributes, such as mycotoxins. For this reason, producers are very sensitive to the mycotoxin levels exhibited in the grain feedstock.

Transportation is a critically important consideration in the marketing of distillers grains. It is most advantageous for dry grind facilities to sell wet (30-35 percent dry basis) or partially dried (45-50 percent solids) distillers grains, since this reduces drying costs, increases production capability, and reduces environmental control requirements. However, the costs of transporting product that is essentially "water" and has a shorter shelf life usually limits the quantity of DWG sold. DDG and DDGS are shipped by rail and truck. However, due to the inconsistent flowability of the product, major railroads have begun to ban the loading of distillers grains on their cars. Since most distillers grains are produced in the Midwest, these bans will primarily affect the West Coast markets, which are serviced almost exclusively by rail.

Additionally, while the U.S. livestock base can absorb all of the distillers grains produced, it can only do so by displacing other feed grains and oilseeds, primarily corn and soybean meal. Standardization of the distillers co-products is essential to their ability to compete with the other feed grains.

The dry grind ethanol industry is undertaking considerable research and development initiatives that will directly and indirectly affect the value and quality of the resulting distillers grains (e.g., quick germ processing and enzymatic milling). Recently, the Southern Illinois University opened the National Corn-to-Ethanol Research Center (NCERC), which tests new ethanol production technologies to determine their commercial viability. NCERC is the only facility in the world that fully emulates both wet mill and dry grind commercial fuel ethanol production plants. The ethanol industry is continuing to innovate and advance technologically to lower production costs and increase the ethanol industry's competitiveness in fuel and feed markets.

The dry grind ethanol industry hopes to increase sales of distillers grains to non-traditional markets (i.e., aquaculture, swine, poultry) and to expand export markets for the anticipated 7 million metric tons of this alternative animal feedstock that will be available in 2006. To accomplish this, the industry must minimize the variability in the quality of the distillers grains and establish industry-accepted standardization for both the co-products and bulk grain feedstock. This lack of industry standardization is threatening to hold back the successful national and international marketing of the co-products.

WHAT RESPONDENTS TOLD GIPSA

MASB spoke with representatives of all segments of the market, including ethanol producers, marketers, researchers, feed formulators, and distillers grain consumers. Market participants were asked if there was a need for GIPSA to: (1) create grading standards for distillers grains, (2) improve the existing terminology/definitions of distillers grains, (3) offer process verification for these products, and/or (4) standardize testing methodologies for distillers grains or bulk corn.

The majority of the commentors agreed that:

1. There is no need at this time for GIPSA or any governmental agency to establish grading standards for distillers grains;
2. GIPSA should remain active in industry discussions and work with the industry to expand definitions and terminology;
3. GIPSA might facilitate marketing through its process verification program; and
4. GIPSA may have a role in minimizing market inefficiencies caused by inconsistent testing by assisting in the standardization and validation of tests used by the market.

These prospective action areas are addressed in detail below. The following section includes relevant background information, highlights of relevant comments, and updates on GIPSA's involvement to date.

Issue 1: Grading Standards

Respondents agreed that although there are challenges the industry must overcome to effectively market the co-products, there is no present need for Federal action, e.g., Federal grades and standards. They prefer to let the buyer and seller set nutrient standards through contractual terms. Most commentors concurred that due to end users' varying needs, the wide variation in production processes, and the evolving nature of the market, it would be premature to create grading standards at this time. Therefore, this issue requires no new action on GIPSA's part, at this time.

Issue 2: Standards of Identity/Terminology

The Association of American Feed Control Officials (AAFCO) and the U.S. Food and Drug Administration maintain the only official definition of the distillers co-products. Most respondents believe that these definitions are too broad and do not accurately describe the distillers grains produced today. Many respondents believe that redefining the product may be the first step to helping facilitate marketing and educating customers about distillers grains. GIPSA is actively participating in working groups within the distillers grains industry to redefine and create industry standards of identity/terminology to describe the wide variety of co-products that are available in the market.

Issue 3: Use of GIPSA Process Verified Program

In the export arena, the European Union (EU) is the major purchaser of U.S. distillers grains. The EU appears to be moving toward requirements for additional quality certification (e.g., Good Manufacturing Practices (GMP) and Hazard Analysis and Critical Control Point (HACCP)) from feed ingredient manufacturers. Implementation of these standards would create an opportunity for GIPSA to offer its process verification services to ethanol facilities and marketing groups. Presently, the State of Minnesota is establishing a processed verified program for two local exporting facilities.

As these quality management standards are implemented, GIPSA could expand upon its current process verification program to include offering services to ethanol processing facilities and co-products marketing groups.

Issue 4: Standardizing Testing Methodology

Co-products

Grain marketing firms, trade associations, researchers, and end users recognize the need for uniform quality measurements to facilitate the growing domestic and international trade in distillers grains. At present, the industry lacks industry-accepted standardized testing methodologies, which precludes end users from accurately comparing or evaluating the quality of products from various facilities.

In an effort to reduce the variation in analytical results being reported among laboratories, industry representatives are working to identify existing testing methodologies maintained by

organizations such as the Association of Official Analytical Chemists (AOAC). Additionally, the ethanol co-products industry is planning to incorporate feedback from feed manufacturers and animal nutritionists about additional quality attributes that are important in feed formulations but for which standardized methodologies may not exist. GIPSA, which has a long history of providing direct testing and testing standardization services, is actively participating in these industry discussions.

Bulk Grain

Seed companies are increasingly interested in increasing the marketing of specific corn hybrids that contain increased levels of fermentable starch. Having a rapid test for this attribute would provide ethanol manufacturers a clearer indication of the value of input feedstock. In June 2004, Pioneer signed a letter of intent with the National Corn Growers Association (NCGA) granting access to their samples, near-infrared calibration, and research.

GIPSA recently met with representatives from NCGA to discuss how the Agency might help establish a national standardized testing methodology that is not specific to a particular company's variety of high fermentable starch corn. While the industry would like a test for high total fermentables, at this time there is no standard reference method for determining high total fermentables. Additionally, at least two companies have developed near-infrared calibrations based on different "reference methods."

GIPSA is actively engaged in discussions with the industry to assist with the goal of developing a national reference standard and ultimately a rapid test for high fermentable corn using near-infrared technology.

SUMMARY

In today's ethanol market, which has sufficient demand to support increased production capacity, co-products offer the ethanol industry a significant opportunity for additional profits. To capitalize on the increasing supply of distillers grains, processors will need to overcome current logistical and marketing inefficiencies. Standardization in the market is a key to their future success.

Feed manufacturers require inputs of consistent quality to improve the performance and nutritional value of the finished product. At this time, end users must rely solely on the information provided by individual processing facilities or marketing groups. Some facilities maintain internal grades to define the quality of their product from batch to batch, but there is no uniformity across the industry.

In light of current market conditions, at the Advisory Committee's November 2004 meeting, MASB recommended that GIPSA continue to monitor the progress of the industry, encourage collaboration among all industry segments, assist in establishing industry accepted standardization, and strive to provide the services the market needs to help the U.S. distillers grains manufacturers grow the market for their product.

In response to MASB's recommendation, the Advisory Committee resolved that "FGIS not move forward with the development of DDG marketing standards and that GIPSA should continue to support the industry in anyway possible." Since this recommendation was made, GIPSA has continued to stay actively engaged with the ethanol co-products industry and will continue to support the industry in its efforts to successfully market ethanol co-products.