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TO: CO-CHAIRPERSONS OLIVE AND WHITAKER

MEMBERS OF THE ANIMAL FEEDING OF DISTILLERS GRAINS STUDY COMMITTEE

FROM: DOUG ADKISSON,
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RE: MINUTES

Attached are minutes from the September 13th meeting. If you have comments or questions of course please do not hesitate to contact me. Chairpersons Olive and Whitaker have agreed that without objection the minutes will be deemed approved on December 1, 2007.

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Legislative Services Agency

MINUTES

Animal Feeding of Distillers Dried Grains Study Committee

September 13, 2007

MEMBERS PRESENT:

Senator Rich Olive, Co-chairperson
Senator Thomas Courtney
Senator Gene Fraise
Senator David Johnson

Representative John Whitaker, Co-chairperson
Representative Dwayne Alons
Representative Dave Deyoe
Representative Tom Schueller
Representative Andrew Wenthe

MEETING IN BRIEF

Organizational staffing provided by: Doug Adkisson, Senior Legal Counsel, (515) 281-3884

Minutes prepared by: Susan Crowley, Senior Legal Counsel, (515) 281-3430

I. Procedural Business
II. Iowa State University Panel
III. Mr. Mark Hulsebus — Renessen LLC
IV. Department of Agriculture and Land Stewardship
V. Panel: Production and Brokerage
VI. Marketing Distillers Products
VII. Committee Discussion and Recommendations
VIII. Materials Filed With the Legislative Services Agency

I. Procedural Business

Call to Order. The Animal Feeding of Distillers Dried Grains Study Committee was called to order by temporary Co-chairperson Olive at 9:00 a.m. on September 13, 2007, in Room 22 of the State Capitol. This was the Committee's only authorized meeting day.

Election of Chairpersons. The Committee elected temporary Co-chairpersons Olive and Whitaker as permanent co-chairpersons.

Adoption of Rules. The rules, as distributed, were approved by the Committee on a voice vote.

Adjournment. The meeting was adjourned at 3:17 p.m.

II. Iowa State University Panel

Overview. Dr. Daniel D. Loy, Dr. Lee Kilmer, and Dr. Mark S. Honeyman discussed the status of distillers products research affecting the production of beef cattle, dairy cattle, and swine.

Distillers Products Explanation. Dr. Loy provided a brief overview of ethanol production and the associated processing of distillers products for beef cattle feed. He emphasized that forms of distillers products promise to provide an important source of feed for Iowa livestock. Dr. Loy described two types of ethanol production facilities — the wet milling process and the dry milling process. The wet milling process produces a wide range of coproducts, including corn gluten feed, corn gluten meal, and condensed steep solubles. Corn gluten feed is a popular cattle protein and energy source. Corn gluten meal is a high-protein feed used primarily in the swine and poultry industries. Condensed steep solubles are a source of soluble protein for liquid beef supplements. Dr. Loy then discussed dry milling operations and the expansion of these operations in Iowa. He focused on the coproducts of this "dry grinding" corn process which are marketed to livestock producers as different forms of distillers products. He identified three forms of distillers products based upon the presence of moisture, including "wet" (WDG), "modified" (MDG), or "dry" (DDG). Dr. Loy also discussed distillers solubles or, more commonly, condensed distillers solubles (CDS). Condensed distillers solubles is a syrup used as a cattle feed supplement or typically added to the wet, modified, or dried forms of distillers grain to produce wet distillers grains with solubles (WDGS), modified distillers grains with solubles (MDGS), or dried distillers grains with solubles (DDGS).

Beef Cattle Feeding. In response to questions from Committee members, Dr. Loy discussed the nutritional value of distillers products and variations in composition which occur within the same milling operation and between different milling operations and stated that his comments are aimed at promoting distiller product testing and accurate representation of its nutrient value. For feeding beef cattle, Dr. Loy noted that research indicates that distillers grains are an excellent source of protein and energy for beef cattle, with optimum feeding levels of up to 40 percent of the cattle's ration calculated on dry matter basis. However, he noted that there are factors that limit the feeding level of distillers grains in livestock feed, including fat content, sulfur content which affects animal health, and phosphorus content. In response to a question by Senator Johnson, Dr. Loy stated that feeding of DDGS raises the levels of nitrogen, particularly phosphorus in cattle manure which affects manure management practices. Dr. Loy also discussed the marketing of different

forms of distillers products, explaining that higher moisture forms are marketed locally near the production facility and the dried form, principally DDGS, is now marketed globally. He also noted that high-moisture feeds have a short shelf life.

Dairy Cattle Feed. Dr. Kilmer discussed the use of the different forms of distillers grain as a cost-effective supplemental feed source for dairy cattle, especially as a protein replacement. He explained how DDGS is digested by lactating cows and the role of ruminally undegradable protein (RUP). He also explained the impact of amino acids and lysine upon milk yield and upon the fat and protein content of milk, which are two key components affecting market price. Dr. Kilmer pointed to studies and feeding trials conducted by the University of South Dakota that indicate milk production and the composition of milk is not adversely affected by incorporating 20 percent DDGS on a dry matter basis into the diet of lactating cows, assuming recommended ration formulations are followed which formulations include an adequate intake of fiber (alfalfa or corn silage). According to Dr. Kilmer, the presence of phosphorus is more of a concern than is sulfur in dairy herd rations. He noted a limiting factor in feeding DDGS is oil content and that a real concern remains regarding concentrations of mycotoxins and specifically aflatoxin. The United States Food and Drug Administration sets the tolerance level for aflatoxin in milk supplies at zero percent. In response to a question by Senator Fraise, Dr. Kilmer stated that concern over the presence of aflatoxin is more with dairy cows and swine than it is with beef cattle. Senator Johnson informed Dr. Kilmer that there is a great deal of appreciation in northwest Iowa for Iowa State University Extension services, particularly the dairy program.

Swine Feed. Dr. Honeyman discussed the use of the different forms of distillers products, particularly DDGS, as a cost-effective supplemental feed source for swine, stating that for every bushel of corn processed by a dry milling facility, 18 pounds of DDGS is produced. He discussed the concentration levels in DDGS of components such as protein, lysine, phosphorus, and oil. Dr. Honeyman emphasized the variability in nutritional components found in samples of DDGS, stating that the quality varies from batch to batch, load to load, day to day, and plant to plant. These nutritional components include crude protein, crude fat, crude fiber, and phosphorus. After questioning by Representative Schueller, Dr. Honeyman stated that the time delay involved in testing of coproducts between production and delivery is an issue, even though next-day testing is available. He stated that if a livestock feeder establishes a good working relationship with a plant, the plant will conduct testing to maintain a consistent product for the customer. However, a herd owner should test samples of each load delivered, he said.

When considering the incorporation of DDGS in swine diets, Dr. Honeyman stated that studies indicate that the upward limit is 20 percent, other than for gestating sows which may tolerate rations incorporating up to 40 percent. Dr. Honeyman noted that feeding DDGS at rates higher than the upward limits noted may affect carcass dressing weights and may also result in softer, oilier fat content with a consequently shorter shelf life. Dr. Honeyman stated that there is persistent concern regarding levels of mycotoxins in distillers products. Other issues identified by Dr. Honeyman as affecting the use of distillers products include control of the market by production facilities and development of branded distillers products, the future role of coproducts brokers, the need for education regarding use of distiller products, regulation of the coproduct industry, and the appropriate use of nutritionalists and independent laboratories to analyze distillers products.

III. Mr. Mark Hulsebus — Renessen LLC

Animal Nutrition Consulting. Mr. Hulsebus explained to the Committee that he is employed as a manager in Cargill's animal nutrition consulting business and is working on contract for Renessen LLC, which is a business venture between Monsanto Company and Cargill focused on developing new technologies for processing corn to improve the efficiency of dry-grind ethanol manufacturing plants and to enhance the value of the coproducts produced in that process. He stated that the Renessen LLC joint venture brings together Cargill's expertise in animal nutrition and grain processing with Monsanto's capabilities in plant breeding and biotechnology research and development.

Starch and Oil Extraction. Mr. Hulsebus described the grain processing technology developed by Renessen LLC trademarked the EXTRAX™ system. The EXTRAX™ system separates corn into two streams, a high-starch fraction largely consisting of endosperm and a high-oil fraction. The high-starch fraction is highly fermentable and is used to produce ethanol. The high-oil fraction is sent through an oil extraction process in which food-grade oil is recovered, and a new corn-replacement meal is created. He noted that the EXTRAX™ process results in increased ethanol yields and decreased energy consumption in the ethanol plant because fermentation capacity is increased by 15 percent, fermentation occurs faster, and the resulting ethanol concentration is higher. He stated that an enhanced form of DDGS, trademarked EPRO™, is developed from the EXTRAX™ process. This enhanced form is high in protein nutritional value with 40 to 50 percent protein content (rather than 27 percent protein found in typical DDGS), less oil, and lower phosphorus levels than traditional DDGS. Furthermore, he noted, with much of the oil removed, EPRO™ DDGS is drier and results in improved flowability and significant savings in energy, handling, and drying costs. Mr. Hulsebus informed the Committee that Renessen LLC is conducting ongoing feed trial evaluations of inclusion of EPRO™ in swine, poultry, and dairy rations.

Feed Product. A livestock feed product, trademarked ECORN™, is one of two products produced from the high-oil fraction. ECORN™, a nutrient-rich, monogastric feed product can replace up to 100 percent of the corn used in swine rations and Renessen LLC is working with seven of the 10 largest swine integrators in the United States to conduct nutritional feed studies on 7,500 swine. In addition, Renessen LLC has invested $15 million to build a fully operational, integrated pilot plant at Cargill's BioProcessing Center Campus in Eddyville, Iowa, to demonstrate the EXTRAX™ technology. Because the system is designed to be added on to the front end of a dry-grind ethanol plant, it can be specifically designed to be retrofitted to existing ethanol plants or integrated into new plant construction plans, he said. In response to a question by Representative Alons, Mr. Hulsebus stated that the technologies developed by the Renessen LLC joint venture will cause a shift in the way that corn is sold in the state by allowing payment to the producer upfront. In response to questions by Co-chairpersons Olive and Whitaker, Mr. Hulsebus said that EPRO™ and ECORN™ both have longer shelf lives than traditional DDGS and that the carcass quality of livestock fed EPRO™ and ECORN™ is high.

IV. Department of Agriculture and Land Stewardship

Commercial Feed Law. Mr. Terry Jensen, Bureau Chief, Commercial Feed and Fertilizer, Department of Agriculture and Land Stewardship, discussed Iowa's commercial feed law (Code chapter 198) and methods used to label distillers coproducts. Mr. Jensen stated that the state's commercial feed law is based on model legislation promulgated by the Association of American Feed Control Officers (AAFCO). According to Mr. Jensen, Iowa law requires that manufacturers of livestock feed provide consumers with a label listing certain contents by maximum or minimum percentage. For distillers grain, the labeled content must include crude protein, crude fat, crude fiber, calcium, phosphorus, and moisture. He emphasized that the listing of exact percentage levels is not mandated by state law. Mr. Jensen discussed an administrative rule adopted by the South Dakota Department of Agriculture requiring that the label for distillers products state, as a percentage, the maximum sulfur in the product. Mr. Jensen expressed concern regarding the presence of antibiotics and mycotoxins, such as aflatoxin, in distillers products, noting that such substances are regulated by the United States Food and Drug Administration.

Compliance Inspections. Mr. Jensen described the department's process of taking samples from production facilities and conducting tests to ensure compliance with label requirements. He commented that the processing of ethanol produces distillers grains having concentrations of substances at a rate of three times that present in corn. In responding to Co-chairperson Whitaker's questions, Mr. Jensen stated that the department maintains seven inspectors who test label requirements for fertilizer in the spring and fall and for feed in the summer and winter of each year. Representative Deyoe inquired about labeling requirements and practices in other states. Mr. Jensen responded that other states are very similar to Iowa's law because most states have adopted the AAFCO model legislation. In response to questions by Representative Alons, Mr. Jensen stated that multiple batches of DDGS are typically stored together, so the department extracts samples for testing from various parts of the pile of DDGS and if feed tested is out of tolerance from its label representation it is retested and, if necessary, taken out of production. He further stated that there are no testing records maintenance required of plants that perform or contract for independent testing of distiller products.

V. Panel: Production and Brokerage

Overview. Mr. Richard Cochran, Mr. John Hall, and Mr. Mark Friedow discussed their experiences with feeding distillers grains and solubles.

Cattle Feedlot. Mr. Cochran is the owner and operator of I-80 Custom Feedlot with a capacity of 900 head of cattle. Mr. Cochran discussed the history of the cattle industry and the use of commercial feed and grain, including corn, and the use of various forms of distillers products. He stated that his operation is conducting a trial using a ration combining corn, corn syrup, sweet corn gluten, dry hay, soy hulls, and minerals. Mr. Cochran explained that he uses an independent laboratory to analyze shipments of distillers products in order to determine if rations need to be adjusted. He also discussed problems associated with using different forms of distillers products, including the transportation and storage of WDGS, noting its weight and short shelf life. Mr. Cochran stated that there is little uniformity in distillers products but emphasized the benefits

associated with the use of distillers products. These benefits include increasing the palatability of the ration and increased weight gain.

In response to questions from Senator Johnson and Representative Deyoe, Mr. Cochran stated that, at one time, sulfur content and moisture content of the distillers products he was purchasing concerned him, but that as the plants perfect their processing procedure and as he builds relationships with established plants, those concerns have abated. He noted that excessive levels of sulfur may result in a variety of health complications for cattle and that varying levels of moisture content require that rations be adjusted which results in disrupted cattle feeding. In response to questions from Representatives Alons and Schueller, Mr. Cochran asserted that if the state required industry standards regarding sulfur, nitrogen, and moisture content, the standards would have to be very broad because not all ethanol plants utilize the same process, and even if it could be standardized, he would still conduct his own testing rather than rely on a generic labeling tag. Mr. Cochran concluded by stating that he hopes that the use of distillers products will encourage increased cattle production in Iowa.

Coproduct Brokerage. Mr. Hall stated that he and his sons are fifth- and sixth-generation cattle producers. He also operates a corn milling coproduct brokerage and delivery business, handling both wet and dry forms of distillers grains. Mr. Hall expressed optimism that feeding distillers products will greatly benefit the state's livestock industry. He provided a summary description of the types of distillers products produced, including wet, modified, and dried forms, with and without solubles. Mr. Hall discussed issues relating to the uniformity of distillers products due to differences in milling processes. He emphasized the importance of employing a nutritionist and using an independent laboratory to analyze samples of distillers products in order to adjust rations. However, he cautioned against mandating uniform, industry-wide nutrient labels, namely because the different milling processes used cause variations in particle size, fat content, suspension of fat in the syrup and sulfur content. Even the growing season may have considerable influence on distiller product value, he said. Emerging technologies, such as fractionalization and improved fermentation methods, also further diversify nutrient profiles in coproducts. Mr. Hall emphasized that livestock producers must have adequate information regarding the contents of distillers products in order to cost effectively feed livestock. However, without first addressing concerns such as carcass quality, cost of gain, and composition of fat, a nutrient label is of no value and is not a necessity, he averred.

Egg Production. Mr. Friedow is a manager of Sparboe Farms, a family farm corporation involved in egg production. He noted Iowa's position as the nation's leader in egg production with approximately 55 million laying hens. Mr. Friedow stated that Sparboe Farms has used DDGS for the previous four years with positive results. He described testing procedures, stating that Sparboe Farms tests each DDGS shipment to ensure compliance with its specifications and routinely adjusts payments or returns shipments to production facilities when deliveries fail to meet those specifications. Mr. Friedow stated that, after experimentation, Sparboe has settled on a feeding ration that includes 10 percent DDGS, which has proven to be a cost-effective feed comparable to soybean meal. Mr. Friedow stated that he is concerned with ethanol plants' use of remensen or penicillin to clean fermenters because both products are illegal to use for chickens. He also expressed a concern that the process of manufacturing DDGS tends to concentrate

mycotoxins. In response to questions from Committee members, Mr. Friedow stated that it is a livestock producer's burden to test regardless of how the state regulates feed or what the labeling on the feed says.

Research Needs. Mr. Cochran, Mr. Hall, and Mr. Friedow encouraged the Committee to consider recommending greater funding for university research, including research regarding how distillers products may be used in beef, dairy, swine, and poultry production. They noted that concerns about carcass quality, cost of gain, and composition of fat in livestock still need to be addressed. Mr. Hall and Mr. Cochran discussed how small cow-calf operations, in order to increase profitability, could utilize forms of distillers products, particularly dry products because of their long shelf life of six to eight months.

VI. Marketing Distillers Products

Overview. Mr. Ryan Sauer, Domestic Marketing Manager for Hawkeye Gold, LLC, and Mr. Michael Lash, Sales Representative for VeraSun Energy Corporation, discussed their experiences in marketing distillers grains to livestock producers.

Hawkeye Gold. Mr. Sauer stated that Hawkeye Gold, LLC, is a subsidiary of Hawkeye Renewables, the fourth largest ethanol producer in the country. Mr. Sauer informed the Committee that, according to current projections, Iowa will annually produce approximately 9.3 million metric tons of DDGS out of an annual total United States production of 32 million metric tons, with potential demand of over 39 million metric tons exceeding potential supply. Mr. Sauer provided a brief overview of the forms of distillers grain and their different component profiles, including percentages of protein, fat, and fiber. Mr. Sauer noted that nutrients in DDGS are generally concentrated at a rate of three times that of corn. He also noted that different species of livestock may be fed DDGS at different rations, with cattle utilizing DDGS up to 40 percent and swine and poultry utilizing up to 10 percent.

Industry Challenges. Mr. Sauer discussed a number of challenges facing the distiller product industry, including a lack of standardized testing, the absence of quality standards, product inconsistency, distribution costs, and negative perceptions. However, he asserted that it is very important to continue to develop markets for distillers products, citing specifically Japan, Asia, the European Union, Mexico, Canada, and the southeastern United States. Mr. Sauer responded to a question by Representative Wenthe by stating that the big concerns of the foreign markets are mycotoxins, moisture content, and fat content.

Vera Sun Energy. Mr. Lash described the operations at VeraSun Energy Corporation. He stated that one bushel of corn produces 2.8 gallons of ethanol and 18 pounds of distillers grain. Mr. Lash described the benefits of using DDGS, including its stability (long shelf life), versatility (fed to both ruminant and nonruminant species), economical use (a competitive protein and energy source), and availability (delivered to site or for pickup from the production facility). The benefits of MDGS are that it mixes well and binds other ingredients while improving overall palatability, it adjusts ration moisture to improve digestion and increase total intake, and its higher oil content increases energy density. Mr. Lash commented that VeraSun provides a guarantee analysis on a dry matter

basis for both MDGS and DDGS, including a minimum of crude protein, minimum crude fat, maximum crude fiber, minimum ash, and maximum sulfur.

Mr. Lash described VeraSun's testing procedures conducted by an independent laboratory, including testing weekly for protein, fat, fiber, and moisture content, and monthly for amino acids, trace minerals, and toxins. The tests are performed by one laboratory for all VeraSun sites to ensure consistency, he said. Mr. Lash described marketing arrangements offered to producers, including by contract on a monthly, spot, or fixed-price basis. He also described VeraSun's technological innovations which involve extracting oil from distillers grains for biodiesel production, thus creating two biofuels from the same feedstock. This also results in concentrating protein and reducing fat content in the distillers grains. Mr. Lash discussed issues affecting the distillers products industry, including lack of standardized testing and the presence of sulfur which is sometimes caused by the introduction of sulfuric acid during the production process.

Testing. In response to Committee members' questions, both Mr. Sauer and Mr. Lash stated that the industry would benefit from mandating standardized testing at both the state and federal level. They agreed that the lack of standardized testing has contributed to the negative perceptions regarding the use of coproducts as livestock feed. They acknowledged that sulfur content has been a limiting factor for feeding distillers products and has created a negative perception among livestock producers. Mr. Lash discussed the South Dakota regulation regarding the labeling of sulfur content by noting that state's high concentrations of sulfur in its water supplies. He stated that he was not aware of any problems caused by the South Dakota regulation, however.

VII. Committee Discussion and Recommendations

The Committee reserved a short period for discussion which revolved around testing requirements, equipment, and procedures. The Committee adopted the following recommendations:

- That the General Assembly enact legislation adopting standardized, analytical testing procedures for distillers products based on findings by the American Feed Industry Association.
- That the appropriate joint subcommittees of the standing appropriations committees for the Iowa Senate and House of Representatives consider increasing funding for university research to improve how distillers products are used in beef, dairy, swine, and poultry production.

VIII. Materials Filed With the Legislative Services Agency

The following materials listed were distributed at or in connection with the meeting and are filed with the Legislative Services Agency. The materials may be accessed from the <Additional Information> link on the Committee's internet page: http://www.legis.state.ia.us/aspx/Committees/Committee.aspx?id=220.

1. Additional Information — "Good as Gold", Successful Farming Article (September 2007), Senator Fraise Handout.

2. Additional Information — Comments Submitted on Behalf of Iowa Renewable Fuels Association, Ms. Lucy Norton, Iowa Renewable Fuels Association.

3. Adopted Rules.
4. Background Information Memorandum.
5. Proposed Rules.
6. South Dakota Administrative Rule.
7. Testimony 1A — Iowa State University, Dr. Loy Presentation.
8. Testimony 1B — Iowa State University — Feeding Ethanol By-products to Beef Cattle, Dr. Loy.
9. Testimony 1C — Iowa State University — Distillers Dried Grains in Dairy Rations, Dr. Kilmer.
10. Testimony 1D — Iowa State University — Feeding Distillers Dried Grains with Solubles (DDGS) to Swine, Dr. Honeyman.
11. Testimony 1E — Iowa State University — Feeding Bioenergy Coproducts to Swine, Dr. Honeyman.
12. Testimony 2A — Comment of Renessen LLC to the Iowa Animal Feeding of Distillers Grains Study Committee, Dr. Hulsebus, Renessen, Presentation.
13. Testimony 3A — Mr. Jensen, Department of Agriculture and Land Stewardship, Presentation.
14. Testimony 3B — Sample Label Distillers Wet Grains, Mr. Jensen, Department of Agriculture and Land Stewardship.
15. Testimony 4A — Production and Brokerage, Mr. Cochran, Presentation.
16. Testimony 4B — Production and Brokerage, Mr. Hall, Presentation.
17. Testimony 5A — Dry Grinding Operations — Marketing DDGS, Mr. Sauer, Hawkeye Gold, LLC, Presentation.
18. Testimony 5B — Dry Grinding Operations — Iowa State Legislature Distillers Committee, Mr. Lash, VeraSun Corp., Presentation.

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