

Beef industry explores effects of feeding ethanol co-products

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Summary

The beef industry has recognized the need to evaluate the current use of ethanol co-products in cattle feed, particularly given the increasing popularity of the practice. Specifically, more information is needed on whether feeding ethanol co-products has quality or safety implications for the industry. In November, the industry hosted, with Checkoff funding, the “Ethanol Co-Products – Beef Implications Summit” in Kansas City and held an issues forum on “Ethanol Co-Products or By-Products?” at the Cattle Industry Annual Convention in Nashville, Tenn. in February. These events addressed the utilization and possible effects of co-products in the beef industry, defining potential use and the still unanswered questions.

Background

Ethanol capacity vs. economics, policy

In 2005 and 2006, the United States planted nearly 82 million and 75 million acres of corn, respectively. One bushel of corn committed to ethanol production will yield 2.8 gallons of ethanol and 17.5 pounds of dry distillers grains (DDG). It is probable that U.S. ethanol capacity will reach 11 billion gallons in 2008, which would require 3.8 billion bushels of corn and will produce 67 billion pounds of DDG and solubles (DGS). According to Bill Holbrook of the ProExporter Network, several key factors, including price of crude oil, gas prices, benefits to ethanol blenders, tax credits and others, will determine the price of ethanol versus the price of corn.

Current government policy that affects ethanol and corn production includes an ethanol blender credit, an import tariff on ethanol and Conservation Reserve Program (CRP) contracts. Neither the expiration of the subsidies nor the maturing of CRP contracts can be counted on to influence corn or ethanol production. Increases in corn production are expected to primarily come from other crop acreage, such as soybeans, or improved corn yield. The Energy Policy Act of 2005, which calls for an increase in ethanol production, also contains guidelines for required growth of cellulosic ethanol from products such as wood, corn stocks and switchgrass.

Viability of ethanol co-products as a feedstuff

The challenge of using ethanol co-products as a feedstuff is not in price, but rather in the limited availability relative

to location, transportation/delivery, storage and nutritional make-up. Location and transportation of co-product go hand-in-hand. It is unlikely the beef industry will move to bring all cattle feeding to the corn-belt, and equally unlikely that corn production will move closer to cattle feeding. As such, it becomes challenging for producers to pay for transporting feedstuffs from the corn-belt to highly concentrated cattle feeding locations. Experts predict that the ton mile demand for truck delivery of corn to ethanol plants and the co-product to users will increase 74 percent from 2005 to 2015. The rail ton mile demand is expected to increase 68 percent in the same time frame.

Nutritionally, corn is consistently 62 percent starch, 15 percent moisture, 10 percent fiber, 9 percent protein and 4 percent fat/oil. Co-products, on the other hand, vary from plant to plant and from day to day. For example, oil content alone will range from 9 percent to 12.5 percent in DDG, 10 percent to 15 percent in wet DGS and is about 3 percent in corn gluten feed (CGF). Fiber, sulfur, moisture, protein and phosphorus also will vary among co-products. So the question for the beef industry is not whether we can feed co-products, but rather, how much co-product cattle can tolerate with the given oil, fiber, sulfur and moisture of co-products compared to steam flaked or rolled corn.

Current recommendations for feeding beef cattle DGS from Iowa State University, the University of Nebraska and the University of Illinois include:

- Feed dry DGS at less than 20 percent of the ration dry matter to supply the protein requirement.
- Feed wet DGS at less than 20 percent of the ration dry matter to supply protein and energy requirements.
- Producers can feed up to 40 percent wet DGS of the ration dry matter, but will be overfeeding protein and phosphorus when feeding at this level.
- In beef cows and backgrounding calves, feed the appropriate quantity to supply supplemental protein, energy and phosphorus when needed with poor quality hay, crop residues and stockpiled forages. There are cost benefits to feeding co-products to cows as compared to feeding rolled, whole or steam flaked corn.

Possible beef implications

Multiple factors need to be considered as beef producers determine how much ethanol co-product to include in

cattle diets. During the Checkoff-funded “Ethanol Co-Products – Beef Implications Summit,” researchers from the University of Nebraska, Iowa State University, the University of Minnesota and Kansas State University presented data on the results of co-product feeding.

The University of Nebraska found replacing up to 40 percent of dry rolled corn with wet DGS improved average daily gain and the feed-gain ratio. Currently, wet DGS is priced at 95 percent of corn prices and return per head increases as inclusion levels increase up to 30 percent. In addition, there are trends of a quadratic response relationship between co-product inclusion level and average daily gain, feed conversion, 12th rib fat thickness, calculated yield grade and marbling score.

Although researchers found marbling scores increased when diets included up to 30 percent wet DGS, they decreased when the inclusion level reached 50 percent of the diet or more. Cattle fed intermediate levels of wet DGS (10%-40%) converted more efficiently, deposited external fat quicker and had higher marbling scores than cattle receiving the control diet. According to the University of Nebraska; however, questions and challenges still remain with fat metabolism, co-product storage and phosphorus levels.

Iowa State University research found the ribeye area, fat thickness, percent kidney-pelvic-heart fat and calculated yield grade all were similar for medium (16%-28%) and high-level (40%) wet DGS inclusion diets and the control group. These data also show marbling scores were significantly lower in the high-level, wet DGS inclusion group when compared to the control- and medium-inclusion diet groups. In addition, steaks from cattle fed a medium-inclusion level of wet DGS were more tender than those from cattle in the high-inclusion level treatment.

University of Minnesota data show inclusion of all co-product types had a quadratic response on yield grade, fat thickness and marbling with those traits peaking at 29 percent, 22 percent and 23 percent inclusion, respectively. Marbling scores decreased beyond 23 percent inclusion, although the affect on marbling and the inclusion level at which marbling began to decrease differed for every yield grade. Ultimately, the inherent increase in dietary fiber may be a greater influence on marbling than the increased metabolizable energy intake.

Results of research at Kansas State University indicate there may be important food safety implications associated with the use of distiller’s grains, but further studies are necessary.

Key Points

- It is probable the U.S. ethanol capacity will reach 11 billion gallons in 2008, which would require 3.8 billion bushels of corn and produce 67 billion pounds of dry distillers grains and solubles.
- Multiple factors and outcomes need to be considered by producers who are deciding how much ethanol co-product to include in cattle diets.
- The ethanol issue involves the ever-changing elements of crude oil prices, corn production levels, ethanol production levels, weather, energy market and many others that ultimately determine the amount and price of the co-products available to beef producers.
- Current research, much of it shared during a beef-industry sponsored summit in November, indicates there is no detriment to feedlot efficiency or carcass quality from feeding DGS at the recommended 20 percent inclusion level.