FEEDLOT NUTRITION

Feeding Distillers' Grains to Beef Cattle

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Increased ethanol processing capacity in the upper Midwest has led to greater supplies of dry milling co-products than was originally imagined. This boom in ethanol production has brought some opportunities for cattlemen, but opportunities bring on the challenge of ensuring that co-products are fed in a manner consistent with proper nutrition and management practices. Producers interested in utilizing distillers' grains in beef cattle diets must understand and manage fluctuations in nutrient content of distillers' grains, issues of storage and handling, and diet formulation.

NUTRIENT CONTENT

Because of transformations to ferment starch from corn grain, starch content of distillers' grains is much lower than that of corn grain, but content of fiber and protein are greater than those of corn grain. Many distillers' grains samples test between 25% and 35% protein. Dry matter content of wet distillers' grains is dependent on the plant where they are produced, but varies from 25% to 35%. Some plants produce a modified wet distiller's grains, which averages from 45% to 50% dry matter. These co-products can be considered as both energy and protein sources for stock cows, and growing and finishing cattle.

Astute producers wishing to utilize these co-products understand that to take full advantage of these co-products, they need to be aware of variations in nutrient content, and of potentially high concentrations of elements such as phosphorus and sulfur. Variations in protein or moisture content lead to undesired fluctuations in protein or dry matter content of diets.

A survey of distillers' grains from several Minnesota and South Dakota plants revealed that average concentrations of phosphorus and sulfur were 0.89% and 0.47%, respectively, but fluctuations in content ranged from 0.68% to 1.09% and 0.12% to 0.82%, for phosphorus and sulfur, respectively. Requirements for S in diets of growing cattle are 0.15% of the diet dry matter (0.033 lb/day when cattle consume 22 lb dry matter/day). The maximum tolerable concentration of sulfur in the diet is 0.40% (0.088 lb/day). A diet containing 15% distillers' grains (dry matter basis) with 0.82% sulfur would provide 0.027 lb sulfur/day or 82% of the sulfur requirement. When considering other components of the diet (corn grain, forage, sulfate-based mineral supplements) and water sulfate content, the diet in this example can easily exceed requirements, and approach toxicity. In areas where sulfate content of water is less than 1,500 ppm, this may not be such a big concern, but sulfate content of water in the west has been known to range from 3,000 to 10,000 ppm. Excess sulfur in the diet or water can reduce absorption of copper or lead to polioencephalomalacia because of excess production of hydrogen sulfide, a gas derived from rumen fermentation.

Thus, it is recommended that producers sample and analyze the supply of distillers' grains they plan to purchase, and to make modifications to diet and management to prevent negative effects on performance. Samples must be taken and analyzed whenever the source or apparent quality of distillers' grains changes, or based on a time schedule.

STORAGE AND HANDLING

Most dry-milling co-products procured in amounts typically required by feedlots are available from ethanol plants, brokers, and local feed elevators, especially those co-products that contain little moisture. When wet co-products are sought, certain purchasing restrictions may apply. For instance, plants require that wet distillers' grains be purchased in semi-loads. Feeders operating small yards or cow-calf producers, wishing to utilize this co-product must either group together to purchase a semi-load at regular intervals of two weeks or less, or purchase singly and be prepared to preserve a semi-load at less regular intervals.

Wet co-products require more elaborate storage because heavy losses can occur from spoilage. Typically, wet distillers' grains have a shelf-life of fewer than 5 days. Ensiling wet co-products will help preserve them. However, investments in silo structures or bags need to be evaluated carefully to prevent excessive storage costs that will offset advantages of using co-products. Researchers recommend mixing blends of 70% WDGS and 30% soybean hulls when filling bags or silos. Silage wedges made within walls made up of large bales may reduce investment; however, care must be taken to ensure that the wedge is firmly packed. Wet distillers' grains can be stored by spreading two 50-lb bags of livestock salt on top of the wedge left behind by the semi-trailer as it delivers the load.

INCLUSION IN DIETS

The energy value of wet and dry distiller's grains were estimated to be 110% and 95% that of corn grain, respectively. Optimum inclusion rate for enhanced gain and feed efficiency using wet distiller's grains in feedlot diets is between 15% and 25% of the diet dry matter. Use of protein supplements containing rumen-degradable true protein sources (soybean meal, canola, etc.) is recommended over urea (limit to no more than 0.5% of diet dry matter). Because of lower energy than corn grain, inclusion rate for dry distillers' grains in feedlot diets must not exceed 15% of the diet dry matter.

Distillers' grains use is highly recommended when diets of beef cows, replacement heifers or calves require supplementation of energy or protein. However, because of its high phosphorus, and rumen-undegradable protein content, caution must be exercised to ensure that the calcium:phosphorus ratio of the diet does not fall below 2:1, or that sufficient degradable protein is supplied to optimize forage use.