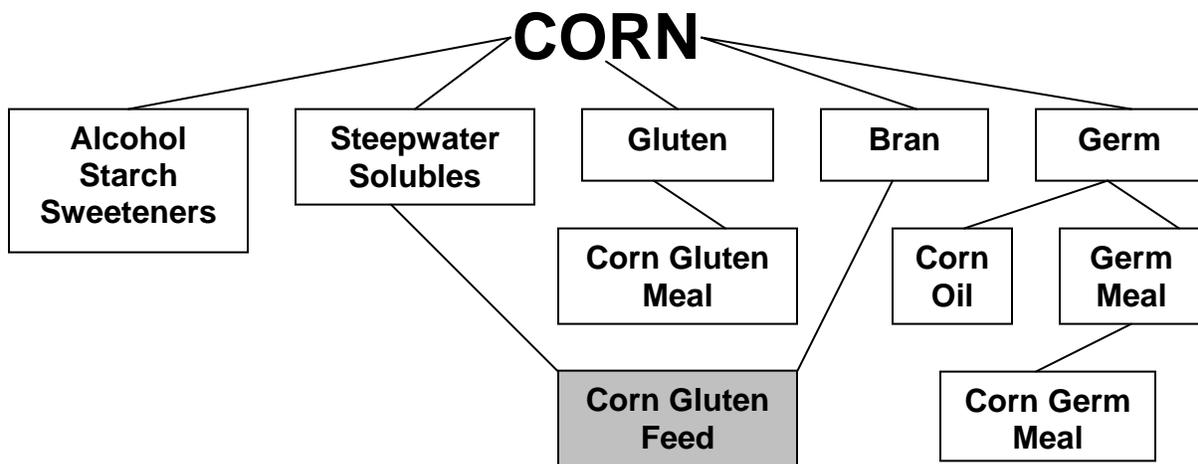


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“Beef Production Strategies” article

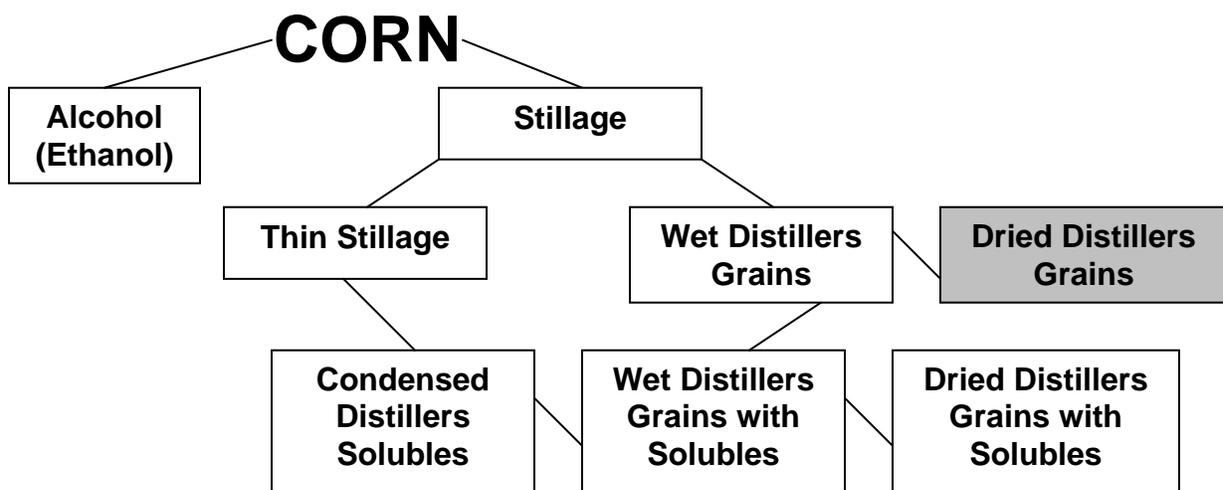
Potential for Ethanol Coproduct Use in Mississippi Beef Herds

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As the ethanol industry grows nationwide, increasing quantities of ethanol coproducts such as dried distillers grains will continue to become available. Potential beef cattle feeds result from both the wet and dry corn milling processes. Wet corn milling produces corn sweeteners and ethanol along with a variety of products and by-products. In the dry corn milling process, corn starch is fermented to ethanol and the nutrients in the rest of the corn kernel are concentrated into distillers feeds.



Corn wet milling industry products



Corn dry milling industry products



Dried distillers grains

Distillers grains can be excellent sources of both supplemental protein and energy in beef cattle diets. Nutrient content can be highly variable, however. South Dakota State University reports that distillers grains vary in nutrient content from corn milling plant to plant and also within the plants. On average distillers grains contain approximately 50% more protein on a dry matter basis than corn gluten feed.

Nutrient content of selected ethanol coproducts.

	Dried Distillers Grains	Dried Distillers Grains with Solubles	Corn Gluten Feed
Dry Matter	90%	90%	90%
Crude Protein	30%	27.8 – 30.4%	20%
Crude Fat	8.4%	8.9 – 10.7%	2.8%
Crude Fiber	14.4%	6.9 – 10.1%	11.1%
Total Digestible Nutrients	77%	85 – 90%	80%
Calcium	0.11%	0.17 – 0.26%	0.06%
Phosphorus	0.41%	0.78 – 0.83%	1.1%

Besides being an excellent source of protein in general, distillers grains (both wet and dried) are an excellent source of “bypass” (rumen undegradable) protein. Bypass protein escapes breakdown in the rumen and can then be directly absorbed in the small intestine to better meet the animal’s metabolizable protein requirements. Higher levels of bypass protein are particularly beneficial in lightweight calves with high protein demands and insufficient energy intake. Rumen bypass protein levels are typically low in most forages, and distillers grains are a good supplementation option on forages for supplying bypass protein. Compared to soybean meal or cottonseed meal, which have much lower levels of rumen bypass protein, the higher bypass protein levels in distillers grains allow a lower protein diet to meet animal requirements.

Distillers grains, similar to corn gluten feed, are low in starch and not likely to depress fiber digestion. In fact, research published by North Dakota State University this year documented that corn condensed distillers solubles improved nutrient availability and use of low quality forages. For low quality forages, 3 to 5 lbs. of dried distillers grains will meet protein and energy supplement requirements for average mature cows in good condition during the last three months of pregnancy. During early lactation, average cows in good condition would need 6 to 8 lbs. of dried distillers grains to meet their nutrient needs on poor quality forage. These rule of thumb recommendations should further be fine-tuned for individual operations depending on cow size, stage of production, body condition score, performance targets, forage analysis, and environment.

Sulfur and calcium levels are mineral levels that should be monitored when feeding ethanol co-products. Sulfur levels can be quite high in corn gluten feed, for example, so care should be taken to make sure that sulfur intake from all sources including water does not exceed 0.4% of the dry matter intake. When low quality forages are used in combination with dried distillers grains, the phosphorus to calcium ratio will be high. Calcium supplementation may be necessary to keep the calcium to phosphorus ratio within a 1:1 to 2:1 range in the total diet.

Most of the research evaluating distillers grains has been performed in finishing cattle. Very little research to date has looked at the effects of feeding various levels of distillers grains to mature cows. Illinois researchers successfully fed diets containing from 50 to 75% distillers grains with solubles on a dry matter basis lactating beef cows. This indicates that there is potential to feed distillers grains in large quantities to mature beef cows. A North Dakota creep feeding study comparing dried distillers grains to soybean meal, soybean hulls, and wheat middlings revealed similar calf performance and showed that dried distillers grains are also suitable in creep feeding programs.

Stocker and feedlot cattle research trials have evaluated distillers grains feeding levels of up to 50% of dietary dry matter with good performance observed. High dietary fat levels may limit feed intake at higher feeding levels. Recent Nebraska research concluded that in yearling cattle grazed at moderate stocking rates, grazed forage intake can be expected to decrease by 0.5 lb. for each 1 lb. of dried distillers grains (dry matter) supplemented.

For Mississippi beef cattle operations, dried distillers appear to have the most potential in lightweight calf supplementation programs and supplementation of cattle on low quality forages. While the drying process reduces the energy value of distillers grains, practical use of wet ethanol co-products such as wet distillers grains is limited locally by high transportation costs when shipping the wet products and storage challenges to avoid spoilage, particularly during warm periods. Shelf life of wet distillers grains can range from just a few days to several weeks and is extended with cool conditions, preservatives that add to product cost, and air exclusion during storage.

Obtaining a reasonable priced, consistent supply of ethanol coproducts is currently one of the big challenges with adoption of these feeding options in Mississippi beef operations. Yet with the increasing attention on ethanol production, it is a good idea to become familiar with ethanol coproducts and their potential as beef cattle feeds in Mississippi. For more information on beef cattle nutrition, contact your local Extension office.

Make plans to attend the Mississippi/ Louisiana/ Alabama Beef Cattle Herd Health Short Course on Monday, November 6, 2007 and Tuesday, November 14, 2007. This short course will be hosted over the Mississippi State University Extension Service distance education system from 6:00 p.m. to 9:00 p.m. each night. Topics to be covered include: cow-calf vaccination programs, internal parasite control, prudent drug use, preconditioning, causes of feedlot diseases, infertility, biosecurity, and National Beef Quality Audit findings.