

CORN GLUTEN FEED

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The domestic corn processing for high-fructose corn syrup and ethanol has made available to beef cattle producers products such as corn gluten feed, corn gluten meal and distillers grains. The focus of this article is corn gluten feed.

Corn gluten feed is a byproduct of the wet milling process. Wet milling separates the corn kernel into starch, oil, protein, and bran. First, the corn is soaked in sulfurous acid. The resulting steep liquor contains protein, minerals, vitamins and energy sources. The starch and oil are extracted from the swollen kernel. The remaining fiber or bran is mixed with the steep liquor. This product, wet corn gluten feed, contains about 40 percent dry matter. The wet corn gluten feed can be dried to about 90 percent dry matter and is called...Dry Corn Gluten Feed!

Corn gluten feed should not be confused with corn gluten meal. Corn gluten meal has 2 times the protein content of corn gluten feed. Also the protein in corn gluten feed is degraded relatively rapidly in the rumen versus the protein of corn gluten meal is degraded relatively slowly (more by-pass potential).

Wet corn gluten feed has some nutritional advantages over dry corn gluten feed but the dry product is easier to handle. Wet corn gluten feed has a bunk life of a few days in summer and one to two weeks in winter. Because of bunk life and transportation costs, wet corn gluten feed is only an option to producers that are in relative close proximity of the milling plant.

Crude protein values have ranged from 17 percent to 26 percent and fat content has ranges from 1 to 7 percent. Therefore, regular feed testing is recommended or buy corn gluten feed that has a guaranteed analysis.

The concentration of crude protein is about as twice as high in corn gluten feed as it is in corn grain. The amino acid content of corn gluten feed is about two times higher than in corn, but relative concentrations of the amino acid are similar. Like corn, the quality of the protein (for example: low lysine) is poor. Corn gluten feed is low in calcium but has significant amounts of phosphorus. The calcium to phosphorus ratio is about 1:10. The desired ratio of feeding cattle is a minimum of 1.5-2 to 1 calcium to phosphorus. Therefore, corn gluten feed fed at high levels without calcium supplementation could result in urinary calculi problems. You will have to feed calcium levels above NRC minimum requirements if more than 1/3 of the diets is corn gluten feed. Trace mineral and vitamin levels can vary greatly from batch to batch.

Corn Gluten Feed as a Protein Source: If diets are formulated to meet the protein requirements and the diets are similar in energy, then corn gluten feed is approximately equal to soybean meal as a protein source. Therefore, if soybean meal (44 percent crude protein) is worth \$200/ton, then dried corn gluten feed would be sort about \$84/ton as a protein source. However, quality of amino acid content is lower for corn gluten feed than soybean meal.

Corn Gluten Feed as an Energy Source: Corn grain has a higher energy content than corn gluten feed. However, corn gluten feed may be equal to corn as an energy supplement in forage-based diets. Corn grain can depress forage (fiber) digestibility, where as, corn gluten feed does not appear to depress fiber digestibility.

In low silage diets (10 percent silage), wet corn gluten feed has an energy value of 95 percent of corn and dry corn gluten feed has an energy value of about 86 percent of corn. In medium silage diets (40 percent corn silage), dry corn gluten feed is worth 92 percent of corn and wet corn gluten feed has an energy value of 95 percent of corn. In high silage diets (70 percent corn silage), wet corn gluten feed and dry corn gluten feed have energy values about 102 percent of corn. Differences between wet and dry corn gluten feed may be due to differences in particle size and/or heat damage during the drying process.

Carcass Characteristics and Health: Corn gluten feed does not appear to affect carcass characteristics or chemical composition of the carcass. No differences in incidence of liver abscesses have be observed. An unconfirmed case of polioencephalomalacia (PEM) was reported when a large amount of freshly made wet corn gluten feed was fed. Some nutritionists recommend that cattle be supplemented with thiamin when large amounts of wet corn gluten feed are being fed for PEM prevention. When corn gluten feed is fed at greater than 35-40 percent of the diet, thiamine supplementation at the rate of 400 mg per head per day could be considered to prevent a deficiency.

Summary: Wet and dry corn gluten feed are valuable by-products for cattle feeding operations. Proper analyses and supplementation will assist cattle producers in using variable batches of corn gluten feed.

Nutrient Composition of Corn Gluten Feed (100% Dry Matter Basis)

Total Digestible Nutrient	80%
Net Energy Maintenance	.88 Mcal/lb
Net Energy Gain	.59 Mcal/lb
Crude Protein	24%
Ruminal Undegradability	22%
Neutral Detergent Fiber	36%
Acid Detergent Fiber	13%
Calcium	.07%
Phosphorus	.95%
Magnesium	.40%
Potassium	1.40%
Sodium	.26%
Sulfur	.47
Copper	7 ppm
Iron	226 ppm
Manganese	22 ppm
Zinc	73 ppm
Molybdenum	2 ppm

