

Co-product FAQs

Answers are from Dr. Dan Loy and Dr. Daryl Strohbehn, a current ISU Extension beef specialist and retired ISU Extension beef specialist, respectively. Do you have a question about ethanol co-products? E-mail your question to the Iowa Beef Center.

1. How much waste is expected during storage when using wet corn co-products? How does this vary summer versus winter?

Unfortunately, there is very little hard data on this question, and the answer probably varies depending on moisture of the product, the type of storage and weather conditions. Informal surveys and limited short-term storage demonstrations indicate that typical storage losses may be around 8% for wet corn gluten feed and perhaps 10% for wet distillers grains. These values may seem high, but are similar to other wet feeds, including silage.

2. As a rule of thumb, how much corn co-product can I use in feedlot rations? Stocker programs? Beef cow rations?

Feedlot rations: As a rule, adding 15-20% of the ration dry matter will often meet the protein requirements and contribute to the energy needs of the cattle. Higher levels can be fed when co-products are competitive with corn as an energy source. Most common levels fed in this situation are 40-50% of the ration dry matter.

Beef Cow rations: There really is no rule of thumb for beef cow rations because it really depends on the nutritional situation presented by each farm. In some situations, the need is for added protein and energy in the ration, while in other situations the ration needs energy supplementation, and distillers grains may be the most economical source of feed energy. Therefore, the level of corn co-product may range from as little as 10% of the ration all the way up to 70% in a limit-fed, high concentrate ration. Your best bet is to run a ration through the BRANDS (Beef Rations and Nutrition Decisions Software) program utilizing your feeds and calculate how much distillers grain would be required. BRANDS software is available from the Iowa Beef Center, or your ISU Extension beef specialist can assist you.

3. Are there limits as to how much corn co-products can/should be used in feedlot rations? Stocker programs? Beef cow rations?

Feedlot and Stocker rations: Research evaluating levels of feeding of distillers grains has evaluated levels up to 50% of the dry matter. Cattle perform well at this level, although the energy value and economic value is best at 15-25% of the ration dry matter. At the higher value, distillers grains are contributing more than 5% of the ration dry matter as added fat, which may be limiting feed intake. Higher levels may be fed if the fat content is lower. For example, corn gluten feed has been fed as high as 90% of the ration. Although the cattle grew somewhat more slowly, they still graded choice and produced acceptable carcasses.

Beef Cow Rations: There is very little research on feeding distillers grains to beef cows. Only a few trials with limited feed combinations have been tried. In a trial at the University of Illinois with lactating beef cows on limited intake rations, the cows were fed diets containing from 50 to 75 percent distillers grains

with solubles on a dry matter basis. Based on this limited experience, it may be possible to feed rations containing large quantities of distillers grains.

4. How do I know what the nutrient levels are in purchased corn co-products?

The only sure way is to have them tested at an analytical laboratory. Work at South Dakota State University has shown that distillers grains do have variation from plant to plant, but also within the plants. For instance, distillers dried grains with solubles had an average crude protein (dry matter basis) of 33.3% and a standard deviation of 2.78%. This means that about 85% of the samples would range from 27.7 to 38.6% crude protein.

5. How do you suggest I compare the prices of the different corn co-products?

Beef Cow Rations: In most Midwest beef cow rations, the principle nutrient needed is likely to be energy, except if the co-product is used in conjunction with cornstalks. When co-products are used to supplement hay rations it is best to compare and price the co-product on a TDN (Total Digestible Nutrient) basis. For instance, if hay is selling at \$100 per ton and has 15% moisture and 55% TDN, the cost per pound of hay TDN would be \$.107. On the other hand, for instance, if dried distillers grains were \$80 per ton and has 10% moisture and 90% TDN, the cost per pound of DDG TDN would be \$.049 per pound of TDN. Of course other considerations have to be taken into account, like storage losses, feed waste and method of feeding the different products.

Feedlot rations: To get a general idea compare the cost per unit of energy or protein. To fine tune this try out our Corn Co-Product Value spreadsheet program, which is a free download from the Iowa Beef Center. It compares the costs of alternative co-products. Ultimately, a ration analysis of your existing ration and alternatives will need to be conducted to fine tune your specific situation. Your nutritionist will have software to evaluate this, or you may consider the BRANDS software program available from the Iowa Beef Center as well.

6. How long can the wet corn co-products be stored?

The answer to this question is dependant on the moisture content of the product, how much air can flow through the feed mass, the environmental conditions and the use of preservatives. Untreated wet distillers grains may need to be fed in 4-5 days before significant spoilage begins in warm weather. Some plants routinely add a preservative which increases the shelf life from days to weeks. This adds a few dollars to the cost of the product however. Other methods to increase shelf life include management similar to silage management such as mixing with other feeds and packing, covering with plastic or bagging. Cool conditions, preservatives and excluding air from the feed mass all extend shelf life of wet co-products.

7. Can wet corn co-products be stored for long periods of time by ensiling the product (plus possibly mixing with other feeds) in silos or bags?

Yes, corn co-products can be stored in bunkers or silo bags. Some of the finer particle size wet coproducts may require mixing with other feeds to accommodate the unloading systems of upright silos.

8. When corn co-products are used at the recommended levels, how does animal performance compare to traditional feedlot rations?

Unless roughage levels are increased, expect animal performance to increase when wet distillers grains are substituted for corn. You have effectively increased the NEg (net energy for gain) of the ration. This may show up as faster daily gains, or similar gains at a slightly lower feed intake. When dried distillers or corn gluten feed are added to feedlot rations expect performance to be similar or slightly improved due to decreased starch feeding and a potential reduction in acidosis.

9. Can I directly substitute wet corn gluten feed for wet distillers grains?

Feedlot rations: Depending on the levels you are feeding and the moisture, you may be able to substitute wet distillers grains for wet corn gluten pound for pound as fed, however due to the variation in moisture of both products, it is advisable to substitute on a dry matter basis. Distillers grains have about 50% more protein on a dry matter basis than corn gluten feed, so only about 2/3 as much dry matter needs to be fed to get the same protein level.

Beef Cow rations: Similar to feedlot situations, you can substitute wet corn gluten feed for wet distillers grains, but keep in mind the large difference that exists in protein content. Distillers grains will give you 50% more protein on a dry matter basis and you may not need that added protein in your ration. From an energy standpoint you will get more energy with distillers grains, but the degree of change will be about 10%, therefore, not impacting the ration greatly. The exception to this would be when large quantities of co-products are being fed.

10. What mineral problems might occur with the use of ethanol co-products?

Feedlot: There are two major mineral concerns with corn co-products. The first is the sulfur content which can be quite high depending on the product. Sulfur can also be present in the drinking water and other feed sources. The main problem is polioencephalomalacia (brainers). Hydrogen sulfide is produced in the rumen which effects thiamine production. Sulfur levels should be monitored. It is recommended that the sulfur content be no more than .4% of the dry matter intake from all sources (including water). The second mineral concern stems from the high phosphorous content of corn co-products. Unless very high levels of calcium are supplemented, an unfavorable calcium to phosphorous ratio (Ca:P) may develop. Urinary calculi (water belly) can develop in steers under these conditions. It is recommended that the calcium to phosphorous ratio be at least 1:1 to 1.5:1.

Beef Cow: Similar to feedlot situations, sulfur could present a problem depending on the co-product used, the rate at which it is being fed and the level of sulfur in the water supply. Of concern would be when DDG is used to supplement low quality hays is the calcium level. Many low quality hays have low calcium content and when fed in combination with DDG the phosphorous intake in relation to the

calcium intake will be high. Therefore, one will need to be sure calcium needs are met and that one achieves close to a 1:1 ratio of calcium to phosphorous.

11. Can I feed condensed corn distillers solubles (CCDS) in a lick tank to my cows?

To be honest, this is a practice that makes us nervous because we are allowing free access to a highly concentrated nutrient source. However, this was done with excess stocker cattle at the ISU Castana Research farm and they seemed to limit their own intake. We also have reports of cow-calf producers observing the same response.

12. Is it okay to pour CCDS onto large round bales of hay or inject them and then feed the bales later to my cows? Or should I mix the CCDS and hay just prior to feeding?

It would be our recommendation that you grind and mix a complete ration that meets nutrient demand of the production phase for the beef cow in question. Besides meeting nutrient needs best, this method avoids offering rations that have high nutrient density in some spots and extremely low nutrient density in other spots. Yes, we have heard that producers are trying this procedure, and similar to pouring liquid supplements on big bales, it gives mixed results. When making this decision, it would be best if one understood what the energy and protein levels were of the big bales, this would allow better approximation of how much CCDS is needed. It would be our opinion that you not pour or inject bales a long period ahead of when they will be fed. Increasing the moisture content of the bales for long time periods or in warm weather could lead to spoilage, mold formation and other potential problems.

13. If mold develops on the ethanol co-products, is it still okay to feed them to my livestock?

Mold itself is not necessarily harmful or toxic to livestock. However, most mycotoxins are produced by molds. Therefore, the presence of mold increases the potential for mycotoxins. Mold can also be unpalatable which may cause cattle to back off feed. In high performance feedlot pens with closely managed feedbunks, such an off feed situation could cause a performance slump that the cattle may not fully recover from. So it is recommended to avoid moldy feeds as a general rule.