

Straight to the Bottom Line – November 1, 2011

By: Steve Martin

### Looking Deeper at a Corn Co-Products

I wanted to make a point when choosing to entitle this column “co-products” as opposed to “byproducts”. In this day of valuable feed ingredients, the traditional lower cost by-product, thought process has gone by the wayside. In the past, the highest value component was removed from the original ingredient and the part that remained was sold at much lower prices. In our current environment, everything has value and there are few bargains to be found. As we have to pay more for these ingredients, it is helpful to have a better understanding of where they come from and how they are best used in dairy diets.

The most commonly used corn co-products are corn gluten feed (CGF), dried distillers grains (DDG) and hominy. In all of these products some of the starch has been removed from the original corn kernel. The primary question to consider is how much starch is left in the co-product. As well, remember that the simple fact that some or almost all of the starch has been removed and will result in an increase in the concentration of the remaining nutrients. Key among these would be the increase of protein, fat and fiber. DDG is the remaining portion of the corn after the production of ethanol and whiskey. It is the coproduct that has had the most starch removed and thus the most significant increase in protein and fat.

Fiber values are moderate. In beef cattle diets and in dairy heifer diets, this fat is of high value.

However, in lactating cows, this fat is a potential detriment to milk fat synthesis and must be managed.

Additionally, the protein in DDG is less available in the rumen. At first glance, this is a positive.

However, after careful consideration, the amino acid balance of this bypass protein leaves much to be desired. Because of this fact, DDG is most commonly used as a high energy ingredient. DDG is considered a palatable

ingredient and in some areas is available as wet distillers and has similar feeding characteristics.

Corn Gluten Feed is a significant ingredient in many dairy diets and is derived from the wet corn milling process. In this process, much of the starch is removed and sold as pure corn starch or further processed into high fructose corn syrup. This syrup is used in many foods including soft drinks. As well, in the wet corn milling process, there is a step that allows for the further removal of corn oil. Unlike the fermentation process involved in the production of ethanol and DDG, the wet corn milling process is not as effective in removing the high value starch from the corn. The resulting material is usually sold as CGF. The ingredient is often pelleted and may be offered as a wet ingredient if close to a production facility. Due to the incomplete starch removal and the removal of the corn oil, the resulting CGF has approximately 15% starch remaining and contains around 19% protein. Fat values are much lower than in DDG. The protein in CGF is more ruminally available than in DDG.

Both DDG and CGF need to be analyzed for sulfur levels. Sulfur containing compounds are used in the manufacturing process for both. Diets need to be monitored to insure that sulfur does not exceed recommended levels. If safe sulfur levels are exceeded, there is an increased risk of Polioencephalomalacia or PEM. The two primary limitations to feed rates for these ingredients are the fat in DDG and the sulfur in both DDG and CGF. DDG and GCF also have great value in dry cow and heifer diets.

Hominy is the third major co-product of corn. Hominy has the most starch of the three with a fat level similar to DDG and 11% protein. Hominy is used quite differently than DDG or CGF as it is primarily fed as a replacement for corn grain itself. Hominy is often touted to have equal or maybe even more energy than corn. However, current models expose the value of hominy. The energy that replaces the reduced starch level is saturated fat and has the same negatives as the fat in DDG. Starch levels in hominy vary widely from 30-50%. Testing should be completed to determine how much of the 70% starch in corn can be replaced with the hominy.

In most cases, US dairy rations are based on moderately high starch levels. As long as this is the case, the starch level in these co-products will mostly determine their value. Items like saturated fat levels and sulfur levels will largely drive their inclusion rates in diets. If we truly learn to formulate diets based on nutrient values as opposed to ingredient tendencies, these co-products can have significant roles in best cost ration formulations. In next month's column, we will consider wheat and oil seed co-products.