

# Texas Dairy Matters

*Higher Education Supporting the Industry*

## USING DISTILLERS GRAINS FOR STARCH

Todd Bilby, Ralph Bruno, Kevin Lager, and Ellen Jordan

Extension Dairy Team

Department of Animal Science

Texas A&M AgriLife Extension Service

The Texas A&M University System

Traditionally, corn has been the major energy source for dairy rations because of the high starch content. The starch provides energy needed for high milk production; however when too much starch is added at the expense of forage, rumen pH decreases. When rumen pH falls, intake decreases as does fiber digestion and milk fat concentration.

The recent surge in ethanol production for fuel has resulted in increased competition for corn. A side benefit of the ethanol industry has been an escalating quantity of byproducts, which can be used by nutritionists in formulating rations. These byproducts present an opportunity to develop rations with energy provided from alternatives to corn. Consequently, rations may be developed that minimize the negative impacts of feeding too much starch.



One of the major ingredients available from ethanol production is distillers grains. For each 56 pound bushel of corn processed for fuel, 18 pounds of distillers grains is generated in addition to the 2.7 gallons of ethanol and carbon dioxide. Both wet and dry distillers grains (WDG and DDG) are available.

Drying distillers grains improves shelf life and ease of handling, while reducing freight charges. If too much heat is applied in the drying process, digestibility declines, as well as palatability. Although some think color is an indicator of overheating, a burnt odor is more accurate.

Distillers grains with soluble (DGS) is produced when part of the “stillage” is added back to the grain. In recent research from South Dakota, substituting dry DGS (DDGS) and soyhulls for the starch from corn was evaluated. Four

different rations were fed with 0, 7, 14 or 21 % DDGS. Starch declined from 29 to 26 to 23 to 20 % in the four rations as DDGS increased. The rations consisted of 27 % corn silage, 22 % alfalfa hay and 51 % concentrate. Soyhulls were added along with the DDGS to maintain crude protein at 17% across the four rations.

As the percent DDGS increased, dry matter intake declined in a linear fashion; however neither milk production nor composition of fat or protein changed. Consequently, feed efficiency tended to improve as the starch was replaced by the non-forage fiber from soyhulls and DDGS.

Results from this research indicate that DDGS, in combination with soyhulls, can partially substitute for the starch from corn without negatively impacting production. At the time of the trial, the calculated feed cost declined from \$4.91 to \$3.49 per cow per day and income over feed cost increased from \$7.02 to \$8.44 per cow per day as starch from corn decreased from 29 to 20 % of the ration and DDGS increased from 0 to 21 %.

The price of various feed ingredients continues to change with time, but by-product feeds provide alternatives to control cost and maintain productivity. Work with your consultant to identify which ingredient combinations might improve your bottom line.

## Reference

Ranathunga, S.D., K.F. Kalscheur, A.R. Hippen, and D.J. Schingoethe. 2010. Replacement of starch from corn with nonforage fiber from distillers grains and soyhulls in diets of lactating dairy cows. *J. Dairy Sci.* 93:1086-1097.