'Super' Feed Concept Adds Value, Marketability to Regional Crops

By Sally Sologuk Backman

As ethanol production swells, distillers grains producers are still searching for new market niches. The nutrient-dense coproduct is giving feed researchers multiple avenues from which to study uses. Livestock producers are beginning to jump on board with the versatile product, and a group of North Dakota researchers is leading the way.


Backman

North Dakota, which has the capacity to produce more than 110 MMgy of ethanol with another 210 MMgy under construction, offers many opportunities to test distillers grains. Ethanol producers, nutritionists and livestock producers and local businesses recently came together to pursue the possibilities.

"North Dakota produces 27 times more feed than we can use locally with the number of livestock that we have in the state," says Vern Anderson, animal scientist at the Carrington, N.D., Research Extension Center. "The bottom line is we produce so much protein-rich and fiber-rich livestock feed in North Dakota that it becomes a challenge to use it all. We have an excess of feed and in order to sell it in the world marketplace and to compete with the distillers grains of Kansas and Nebraska, we need to be differentiated."

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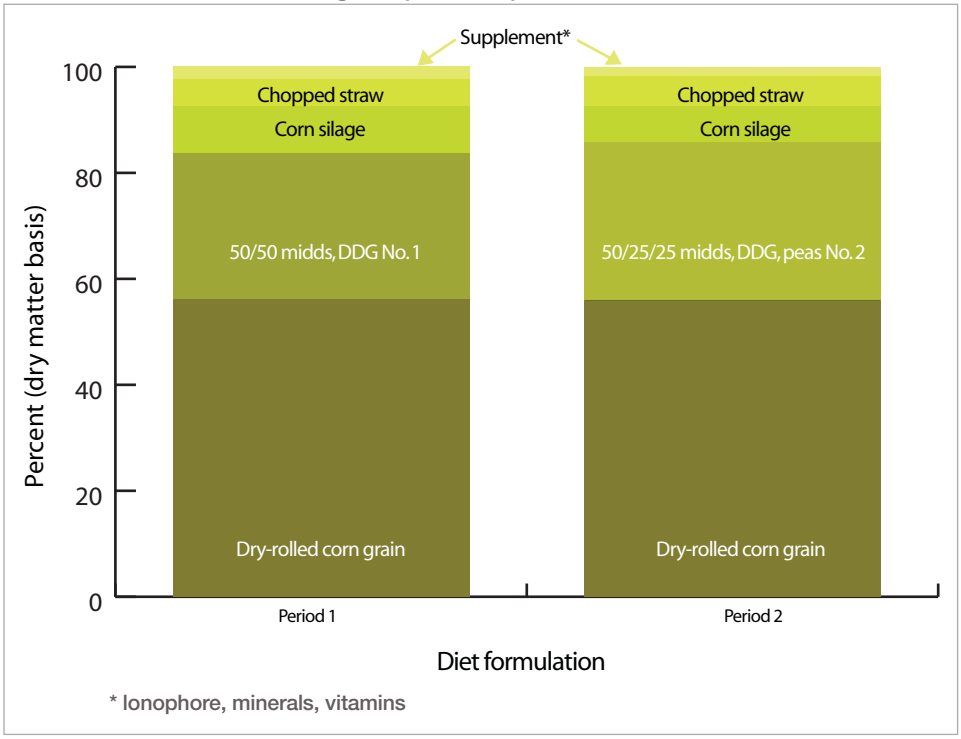
Combinatorial Pelleting of 'Super' Feeds

The need for market differentiation ultimately resulted in the manufacture of coproduct combination feeds, or what Anderson calls "super" feeds. The underlying concept was mutually developed at the REC and Northern Crops Institute in Fargo, N.D. The research, headed by Anderson and Kim Koch, manager at NCI's Feed Production Center, suggests that by developing formulations from different combinations of coproducts and grains with complimentary nutritional profiles, pelleted compound feeds can be made for specific purposes.

"Instead of handling two or three or four feeds, dairymen in California, China or Mexico would just handle one," Anderson says. "We are differentiating this product from other single-ingredient, individual commodities, which have nutritional and physi-

Table 1. Rations fed containing compound coproduct feeds



SOURCE: CARRINGTON, N.D., RESEARCH EXTENSION CENTER

cal issues that may impede their flowability, storability and their palatability to some extent."

The researchers use the term combinatorial pelleting to describe the process, according to Koch. "Pelleting isn't overly complicated," he says. "It adds density to the product, improves its handling characteristics and should improve its shelf life."

Anderson adds, "The pelleting issue has some challenges in that these fibrous byproducts don't always pellet well. We have the ability to put in binders such as peas, which have a terrific binding ability, resulting in better pellets, and they add nutrients, digestibility and palatability."

Studies into combinatorial pelleting of coproduct feeds have commenced at both North Dakota locations. Koch did a study on pelleting barley malt sprouts (BMS) and distillers dried grains (DDG) at NCI. The second study reported in this article began when a pasta manufacturer challenged Anderson and his staff to help the company add value to wheat midds. Procedures and results of both studies are published in the 2007 NDSU Beef Feedlot Research Report.

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Combining BMS and DDG in Pellets

"Barley malt sprouts and distillers dried grains are known to have high nutrient profiles and are available at relatively low cost," Koch says. Unfortunately, they are often difficult to pellet by themselves.

Previous studies done at the NCI Feed Production Center suggest that compared with ground barley, the pelleting of a BMS mix or a BMS/DDG mix requires a higher electrical energy demand. These prior experiences suggest that by using steam pelleting to combine BMS and distillers dried grains with solubles (DDGS), some of their negative attributes cancel one another, resulting in a more user-friendly product.

The focus of this study was to observe the conditions necessary for production of good quality pellets when using commercially representative BMS and DDG. BMS were obtained from two sources. The first was a blended product containing BMS, ground screenings and ground thin barley (a commercial product developed to reduce the difficulty of pelleting 100 percent BMS). The second was solely BMS. DDG were from a single source, having a nutrient content consistent with NRC values.

In Trial 1, graded additions (10 percent, 20 percent and 30 percent) of DDG were combined with the BMS

mix. In Trial 2, the same graded additions of DDG were used plus the 100 percent BMS product.

Koch concluded from the study that adding DDG to BMS improves overall pelleting characteristics and provides potentially significant energy cost savings, with manageable losses to pellet quality. "Combining DDG with BMS could be a win-win situation," Koch says. "Feed processors would realize decreased energy costs and also decreased machinery wear and lower maintenance costs (parts and labor). Livestock producers would receive a more user-friendly feed with a complimentary nutrient profile. The end result would be an increased drawdown on the DDG inventory."

Compound Feeds from Wheat Midds, DDG and Peas

The second study arose from a request by Dakota Growers Pasta Co., Carrington, N.D., for Anderson and his staff to develop a value-added use for wheat midds, a byproduct of their semolina milling and pasta manufacturing. The researchers came up with the idea to formulate multiple compound feeds with combinations of wheat midds, distillers grains and peas.

After developing and test pelleting seven coproduct formulations at NCI, two were selected for manufacturing at a commercial feed plant and fed to cattle in a feedlot at the Carrington center. The pellets were fed to steers as part of a balanced diet.

A demonstration feeding trial was initiated Dec. 12, 2006, with 49 steer calves. During the first 62-day feeding period, the pelleted super feed with 50 percent midds and 50 percent DDG (24.33 percent crude protein, 55 mega calories net energy of gain) was fed, while the coproduct formulation containing 50 percent midds, 25 percent DDG and 25 percent field pea (23.65 percent crude protein, 54 mega calories net energy of gain) was fed until slaughter (Table 1). Peas in the diet help to ensure tenderness and juiciness in the beef. The two pelleted compound feeds were included at 28 percent and 30 percent of the diet dry matter, respectively, for periods 1 and 2. Carcass traits were exceptional for steers that were marketed at less than 1 year of age, with 74 percent of the steers grading USDA Choice or better.

Blending DDG with wheat

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midds and field peas increased nutrient density, palatability and rumen undegradable protein compared with durum wheat midds alone.

"While the protocol of this study did not provide for any side-by-side comparative research on the coproduct feed formulation, the experience of feeding these two products was very positive and the carcasses graded very well," Anderson says.

The study's investigators conclude that there is a need to conduct research with larger numbers of animals using different formulations with commercial potential for marketing. Additional research may include different formulations with barley malt, oilseed meals, beet pulp, soy hulls and other coproducts.

Conclusion

Anderson and Koch state that they have seen a great deal of interest across North Dakota in super or coproduct combination feeds.

"This project is a great example of how Carrington Research Extension Center, NCI, North Dakota State University and the processors are working together to try to solve a problem to the advantage of the livestock producer," Koch says. "In private conversations, feed industry people acknowledge that this concept has potential. We are proposing more research and development of combination feeds in the near future." DGQ

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