Byproducts Offer Alternatives

by ***Troy Smith***

For the producer concerned about possible negative effects of supplementing the cow herd's forage-based diet with starchy feed ingredients such as corn or other grains, there are alternatives. Digestible fiber energy sources, such as wheat middlings, corn gluten feed and soybean hulls, are less likely to depress forage intake or digestibility. All of these feedstuffs originated as "byproducts" of grain-processing industries, but many processors now refer to them as "co-products" and have become more aggressive in their marketing efforts.

According to Dale Blasi, Kansas State University (K-State) Extension specialist, the drawback to some byproduct feeds is that availability may be seasonal if processing does not occur year-round. Certain products may be most practical for producers in regions where the source crop is grown and processed, and transportation costs are low.

"It depends on the product, but if the mills only run part-time, supplies may be variable. Prices are, too. If low supply coincides with high demand, it drives up the cost," Blasi says. "There are storage and handling challenges with some of them. Everything has its drawbacks, but producers shouldn't ignore these byproducts."

Wheat midds and straw

Working in Kansas and having family ties to eastern Colorado, Blasi has seen many producers use wheat midds in rations for growing cattle, but also as an economical supplement for cows. Fort Collins, Colo., cattleman Mike Pay says he will save a dollar per head per day while feeding his cows pelleted wheat midds and straw instead of hay costing well over $100 per ton.

After coming off grass in the fall, Pay's registered Angus herd grazes cornstalks until January. From then until spring turnout, the cows are fed 17 lb. of wheat midds per day and 15-20 lb. of barley straw.

"If I'm feeling particularly generous, I might give them a few pounds of alfalfa hay. But probably not," Pay says, grinning. "The barley straw costs $60 a ton and wheat midds cost $100. That puts the per-cow feed cost at about $1.50 per day, instead of $2.50 when going the usual (all hay) route."

A byproduct of the flour-milling industry, wheat midds contain higher levels of fiber, protein and minerals than the parent grain, but have lower amounts of starch and energy. Available as pellets or cubes, the fiber-friendly nature of wheat midds means energy may be added to forage-based diets with little or no negative impact on forage digestibility. However, Blasi says wheat midds generally are high in phosphorous and low in calcium, so producers may need to adjust mineral supplementation accordingly.

"Be aware that neither wheat midd pellets nor cubes will store like grain," Blasi warns. "Producers often report problems with extended on-farm storage, particularly in summer heat and humidity when the pellets may soften and mold. It might be best to start with small quantities until the producer learns how to handle the product."

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►Corn is not the only feedstuff that can be used to supplement cows during periods of drought and reduced forages. Wheat middlings, corn gluten feed and soybean hulls are all options to supplement for digestible fiber energy sources.

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Table 1: Typical composition of commonly used forages and alternative feed sources

Feed	% DM[1]	% TDN[2]	% Protein
Corn	86	90	10
Ear corn	87	83	9
Soybean hulls	91	78	12
Wheat midds	90	85	19
Corn gluten feed (dry)	88	77	21
Corn gluten feed (wet)	60	86	20
Distillers' grain, corn (dry)	92	90	29
Distillers' grain, corn (wet)	30	90	29
Wheat straw	90	42	4
Alfalfa hay (early bloom)	90	60	18
Prairie hay (med. quality)	90	50	8
Sudan hay (early)	89	56	9

[1]DM = dry matter.
[2]TDN = total digestible nutrients.

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Soy hulls

Soy hulls (the outer covering of the soybean) are another popular choice as an energy supplement to high-forage diets. Their highly digestible fiber content makes them comparable to corn as an energy source, but they contain very little starch. The typical crude protein (CP) value of soy hulls is listed as 12%, but actual protein content may vary widely, depending on the amount of soybean particles included.

Soy hulls are pelleted to aid shipping and feeding, but as with wheat midds, producers have experienced problems with pellet integrity. Blasi also says cattle may bloat if they consume too much of this product. Soy hulls expand a great deal after coming in contact with water and saliva, often making cattle appear full, and true gas bloat may occur when large amounts are fed. Bloat is more likely when soy hulls are fed at levels exceeding 1.5% of body weight.

Two years ago, Minert/Simonson Angus Ranch, Dunning, Neb., headed toward winter with a short hay supply. Lowell Minert and son-in-law J.W. Simonson started supplementing their cows with soy hulls. Hay was scarce again last year, so they bought more soy hulls, as well as dry distillers' grain.

"We've wintered cows on three or four pounds of soy hulls per day, plus hay. I'd say a pound of soy hulls will replace about one and a half pounds of hay," Minert offers. "We haven't had any real problems with storage and handling, but we have seen some difference in pellets from different plants. The price pretty much follows hay price, but if you take advantage of seasonal lows to contract soy hulls, they're competitive with corn. And you don't have to worry about depressing forage utilization."

Distillers' grain

In the process of making ethanol, the starch in corn or other grains is converted to alcohol and removed. What remains is the distillers' grain, which is high in TDN and protein, as well as minerals and vitamins. In some areas its cost also may be high, relative to other energy sources, so distillers' grain often is used as a protein supplement. Available in either wet or dry forms, the cost of transportation for the wet product is higher, and it deteriorates much more rapidly. Dry forms include meal and pellets. Distillers' grain also contains about 10% fat, which may be advantageous in maintenance and development diets for breeding cattle.

Minert has successfully used distillers' grain, in combination with soy hulls, to supplement breeding bulls, heifers and embryo donor cows. With the addition of sun-cured dehydrated pellets, the byproduct feeds also have been used in a 16% protein creep feed.

"This year, it's drier still. By mid-summer, we started supplementing pairs on pasture, feeding 10 pounds of soy hulls, every other day, to stretch the grass," Minert adds. "And we're really short of hay now, so we'll be feeding some silage to cows this winter. We'll probably mix soy hulls and distillers' grain with that."

Corn gluten

Corn gluten feed is a byproduct of the wet corn milling industry's production of corn starch, corn syrup and corn oil. It is available in either wet or dry forms, with the latter being easier to handle and cheaper to ship. Gluten feed is frequently used in feedlot rations, because it provides similar gains and feed efficiencies as corn grain. Depending on availability and price, it also may be a viable alternative feed for supplementing forage, without depressing fiber digestibility.

Comparing costs

When comparing costs of alternative feed sources, it's a good idea to make sure you're comparing "apples to apples." Extension beef specialist Cody Wright, South Dakota State University, recommends that producers use a delivered cost per ton of dry matter (DM) for each feed source considered, then compare them for energy, or total digestible nutrients (TDN), and protein.

For example, suppose the delivered cost of corn is $70 per ton. Corn is 86% dry matter and 90% TDN, so to obtain the corn's cost per ton of TDN, make the following calculations:

$70 ÷ 0.86 (DM) = $81.39 per ton of DM

$81.39 ÷ 0.9 (TDN) = corn cost at $90.43 per ton of TDN

If the delivered price for pelleted soy hulls is $85, figure the cost per ton of TDN using values of 90% DM and 77% TDN.

$85 ÷ 0.9 (DM) = $94.44 per ton of DM

$94.44 ÷ 0.77 (TDN) = soy hull cost at $122.65 per ton of TDN

For comparison, calculate prairie hay at 90% DM and 50% TDN. Assume the hay costs $80 per ton, delivered.

$80 ÷ 0.9 (DM) = $ 88.88 per ton of DM

$88.88 ÷ 0.5 (TDN) = prairie hay cost at $177.76 per ton of TDN

Similar calculations can be made to compare the cost per ton of protein for various feedstuffs. Remember to calculate DM cost first, then divide by the appropriate protein percentage. Nutrient content can vary, so feed analysis is advised, but Table 1 shows the typical composition of some commonly used forages and alternative feed sources.