[PHOTO BY SHAUNA ROSE HERMEL]

Grazing With Distillers' Grains

The availability of distillers' grains promises to change how many of us pasture our cattle.

Story by
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If there is a single trait all successful ranchers share it is the ability to respond rapidly to changing conditions. Perhaps it is a necessity considering the tough economic realities associated with squeezing a regular income out of a less-than-predictable market environment. This tests even the sharpest among us.

Seizing the opportunity when first presented is an art unto itself, and those who have mastered that art usually manage to stay ahead of the pack by turning what appears initially to be a financial disadvantage into an economic opportunity. Today this is especially true for those individuals who have successfully integrated distillers' grains (DGs) into their grass-grazing strategy.

"From an animal performance standpoint, I think that distillers' grains are an excellent source for both energy and protein," says Alfredo DiCostanzo, professor of beef cattle nutrition and management, University of Minnesota. "The product is particularly high in the type of protein that is quite often deficient in some commonly grazed grasses."

He adds that this applies to temperate grasses such as bluegrass, bromes and fescues. "That is where I see good compatibility on the protein-fraction end of things," DiCostanzo says. "Especially when these grasses get to a lower-protein, mature state, I think that distillers' can unlock some of the energy that is in them."

In a comprehensive study titled "Critical Control Points for Profitability in the Cow-calf Enterprise," Alan Miller, University of Illinois Extension beef specialist and Angus breeder, analyzed data collected from 225 commercial herds in Iowa and Illinois, ranging in size from 20 cows to 373 cows. He determined that the No. 1 expense, accounting for more than 50% of total expenditures was feeding-related, most of that cost going to mother cow maintenance.

It is common knowledge among beef educators that calf producers traditionally tend to view the costs associated with maintaining a mother cow as fixed. Instead, they choose to focus on maximizing calf weight to generate more profit when the animal sells.

Because pasture grazing plays such an integral part in the maintenance of beef cows throughout the country, DiCostanzo believes that by supplementing distillers' grains, calf producers, including seedstock operators, now have an opportunity to better utilize their grazing resources, which, in turn, will have a positive effect on their bottom line.

Supplement for all seasons

DiCostanzo is quick to point out that while distillers' grains offer a valuable and versatile complement to grazing grasses throughout the year, the role they play in a beef cow's diet changes with the seasons. He adds that it is important the livestock producer understands the dynamics associated with feeding distillers' grains with grasses grazed at various stages of development so that he can take steps to optimize nutrient synchrony (see cover story) and feed efficiency.

He cites, as an example, using distillers' grains as a supplement in conjunction with the grazing of low-quality pasture through the midsummer slump.

"When we are dealing with mature grasses that are probably low in degradable protein, like wheatgrass, it might make sense to include a little urea with the distillers' grains," DiCostanzo says. "Degradable protein is needed to feed the rumen bacteria so that they, in turn, can digest the fiber in the wheatgrass."

DiCostanzo notes that while distillers' grains aren't particularly high in digestible protein, they do contain substantial amounts of bypass protein, which is beneficial to reproduction. After weaning he sees the nutritional demands of a cow shifting away from protein.

"On dry cows, the need for plain protein is relatively low, so we may be thinking more of supplementing energy through using DDGs (dried distillers' grains)," he says, pointing out that during drought years, when condition scores suffer during the summer, supplementing higher levels of distillers' grains might prove to be the most cost-effective way to build condition before that critical fetal-growth period.

"At that point I might stop supplementing urea, because I am feeding so much distillers' — up to 9 pounds (lb.) per cow per day — I will have enough degradable protein to feed the bugs in the rumen," he says.

He points out that much of the protein in the distillers' grains is not utilized by the cows and ends up deposited in the pasture. DiCostanzo says that in feedlot situations this can prove to be counterproductive from an environmental standpoint, but in a grazing scenario, on marginal ground, such an infusion of nutrients can be beneficial.

"The cows are definitely adding value back to the pasture," he says, noting that during the late fall and winter, approximately 50% of protein in the manure and urine is recaptured by the pasture grasses. In the spring and summer months, when the plants are actively growing, that rate is somewhat higher.

Depending on the circumstances — the cost of grazing vs. the cost of the DDGs — DiCostanzo also sees

Table 1: Energy (TDN), metabolizable protein (MP), calcium (Ca) and phosphorus (P) requirements of British × Brahman cows and first-calf heifers[a,b]

	TDN, kg	MP, g	Ca, g	P, g
500-kg[c] cow:				
Early lactation	6.6	735.7	31.3	21.0
Mid-lactation	5.8	606.0	25.0	17.3
Weaned	4.0	424.3	15.0	12.0
Late pregnant	5.0	524.3	25.0	16.0
525-kg cow:				
Early lactation	7.1	798.0	34.3	23.0
Mid-lactation	6.2	650.3	27.0	19.0
Weaned	4.1	443.0	16.0	13.0
Late pregnant	5.4	559.7	27.0	17.0
550-kg cow:				
Early lactation	7.3	813.0	35.0	23.3
Mid-lactation	6.3	664.7	28.0	19.3
Weaned	4.3	458.0	17.0	13.0
Late pregnant	5.5	574.7	28.0	17.0
325-kg heifer:				
First trimester	3.8	403.7	18.0	11.0
Second trimester	4.3	445.7	19.0	11.7
Last trimester	5.6	561.3	28.7	16.0
340-kg heifer:				
First trimester	3.9	419.7	19.0	11.3
Second trimester	4.4	462.0	19.7	12.0
Last trimester	5.8	578.7	29.3	16.3
360-kg heifer				
First trimester	4.1	435.3	20.0	12.0
Second trimester	4.6	478.7	20.7	12.7
Last trimester	6.0	596.0	30.3	17.0

[a]Heifer body weight at conception for heifers with mature weights at 500, 525 or 550 kg, respectively.

[b]NRC, 1996.

[c]1 kg = 2.2046 lb.

Source: Alfredo DiCostanzo, professor of beef cattle nutrition and management, University of Minnesota.

the practice of increasing the amount of distillers' grains into the fall as a viable way of extending the grazing period on otherwise marginal pastureland, thus reducing the need for high-cost stored hay.

"In areas where distillers' is $100 a ton and hay is selling for $120 a ton, that strategy makes good sense," he says, cautioning that there are some risks involved in feeding higher levels of distillers' grains to mother cows. "The amount of sulfate in these distillers' grains can be very high, and producers should be aware of that."

Sulfur a concern

While sulfur (S) is an essential component of the ruminant animal's diet, high dietary concentrations of the mineral can prove fatal. The National Research Council's (NRC's) 1996 *Nutrient Requirements of Beef Cattle* recommends a sulfur concentration of 0.15%, which is needed for formation of certain amino acids and the B vitamins thiamine and biotin, as well as used in some detoxification reactions to maintain normal functioning of body cells.

A total dry-matter (DM) intake from all sources (including water) greater than 0.4% is considered above the tolerable level by NRC standards and can lead to polioencephalomalacia (PEM). PEM is caused by production of excessive amounts of hydrogen sulfide — a gas derived from rumen fermentation — which is belched and then rebreathed into the lungs and carried to the brain, resulting in the necrosis of the cerebrocortical region.

Limin Kung of the Department of Animal and Food Sciences at the University of Delaware has studied the effect of sulfur dioxide poisoning on ruminants. He warns that the mechanism by which the toxins are transmitted — belching and rebreathing sulfur dioxide — is responsible for generating a wide range of responses.

"You might have one or two animals that show clinical signs of PEM and others that appear perfectly fine," he says.

Those animals that show clinical signs of PEM (called "brainers") will often push their heads against solid objects or stagger in circles. Others may look into the sky with their heads thrown back over their shoulders. Common symptoms are respiratory distress, reduced feed intake and reduced rumen motility. Advanced signs of PEM include blindness, thrashing, kicking at the stomach and moaning, followed by death within two days.

DiCostanzo notes the best way to deal with any potential sulfur problems is to first examine a herd's total intake. He adds that anything going into an animal's mouth should be tested for background sulfur content. That includes water and all other feed sources.

Kung agrees and notes that the sulfur in a water supply can be a real contributor to the overall percentage of the mineral consumed by an animal in a feedlot.

"For example, if you had water with a sulfur content of 1,000 parts per million and you have a steer drinking 30 liters of water a day, that translates into 12 grams of sulfur," he says. "That is the equivalent of 0.1% in the diet."

Both DiCostanzo and Kung recommend that the first step to integrating DDGs into any grazing program is having the water tested for specific minerals and then to work directly with a nutritionist to determine exactly what the daily sulfur intake is per animal.

Spring grazing enhanced with DDGs

With the advent of spring grazing, the role distillers' grains play serving the nutritional needs of mother cows changes again, DiCostanzo says. "In most spring grazing scenarios, the protein in the newly emerging grass will be of the highly degradable variety," he says. "Adding a pound or two of distillers' does provide the bypass protein that is not available in the grass."

For DiCostanzo this means that the cow will receive the bypass protein she needs for rebreeding and lactation. "Even in quality forage situations with 12% to 14% crude protein (CP) and more than enough degradable protein for proper rumen function, adding a supplement high

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in bypass protein will improve breed back and milk production," he says, adding that the presence of the bypass protein will also help slow down the digestive process that has been stimulated by the large amounts of degradable protein passing through the system. "This will allow for better feed efficiency and the greater utilization of nutrients than would be possible without the addition of DDGs."

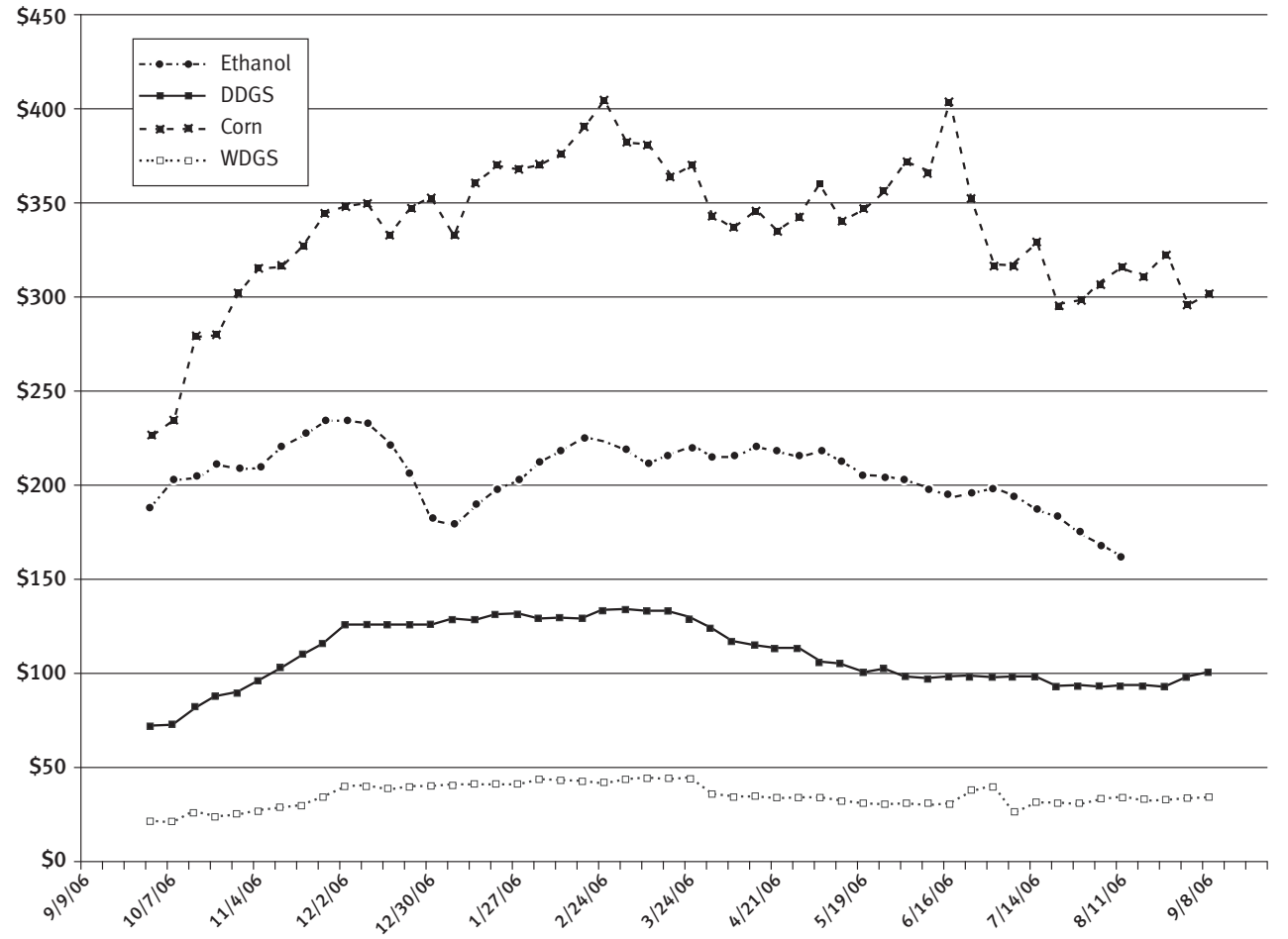
Finally, DiCostanzo views the inclusion of dried distillers' grains in a spring grazing scenario as one way to turn mother cows out on pasture sooner than would be practical without supplementation.

"With DDGs I have no problem with pushing cows out on pasture earlier than most would expect, because I know the cows will get what they need," he says. "And the wider grazing window helps me to manage my grasses so they don't get away from me."

He notes that price makes dried distillers' grains a viable early spring grazing supplement. "At $100 to $110 a ton, dried distillers' grain is remarkably cheap when compared with soybean meal that is twice the price but delivers only a quarter of the protein," DiCostanzo says.

As for getting the cows to eat distillers' grains when they have the option of grazing on young, high-protein grass, DiCostanzo suggests establishing an intensive rotational grazing regimen that limits access to fresh grass and encourages the consumption of the DDGs.

Fig. 1: Northwest Iowa prices for ethanol, DDGS, corn and WDGS



Source: Alfredo DiCostanzo, professor of beef cattle nutrition and management, University of Minnesota