Ridin' Herd

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Drought corn silage in beef cow diets

Drought poses many problems for cow-calf producers. The low productivity of pasture and rangeland poses the challenge of how to best manage cattle and maintain long-term viability of the grass resource. The other challenge, especially in areas where year-round grazing is not an option, is how to economically secure feeds for the time when cows are fed harvested forage. In drought conditions, hays and alfalfas are usually expensive because yield is low and demand is high. Corn silage is a feed that we don't typically feed to beef cows. Corn silage is usually used in growing calf and feedlot diets because of its high nutritive value, especially energy. When hays and alfalfas are expensive, corn silage is a feed that cow-calf producers should consider.

Determine cost per pound of nutrient

When comparing feeds to use in your feeding program, and you know what nutrient (protein, energy, phosphorus, etc.) is needed, compare them on a dollar-per-nutrient basis.

When this pricing procedure is used, it is important to compare the feeds on the same moisture basis. The easiest way to compare different feeds on an equal moisture basis is to compare them on a 100% dry-matter (DM) basis.

Silage and grass hay are used in cow diets as an energy source. This summer in Nebraska, large round bales of grass hay were priced at $80-$90 per ton, and alfalfa that was determined to be in "fair" quality ranged from $90 to $100 per ton. In addition, wheat straw was priced at $60 per ton.

Let's say, for example, we need to purchase energy for the winter-feeding program and alfalfa was an option priced at $90 per ton delivered. The alfalfa tested at 57% total digestible nutrients (TDN), 18% crude protein (CP) and 88% DM. The cost of alfalfa per pound (lb.) of TDN on a 100% DM basis is $0.09 per lb. of TDN (2,000 lb. per ton x 0.88 × 0.57 = 1,003 lb. of TDN in a ton of alfalfa that is 100% DM; then $90 ÷ 1,003 lb. of TDN = $0.0897 per lb. of TDN).

Let's compare this to drought silage that yielded 40 bushels (bu.) per acre. Regular silage is 72% TDN, so let's put drought corn silage at 64.8% TDN (90% of regular silage), and the DM is 35% and cost in the bunker silo is $22 per ton. Using the same procedure as above, the cost per lb. of TDN for corn silage is $0.05 per lb. of TDN (2,000 lb. per ton × 0.35 × 0.648 = 453.6 lb. of TDN in a ton silage on 100% DM basis; then $22 ÷ 453.6 lb. of TDN = $0.0485 per lb. of TDN). If you had the equipment to put up and deliver corn silage to the cow herd, corn silage would be a better buy than alfalfa as an energy source at the prices used in the calculations above.

Feeding corn silage to cows

Drought-damaged corn silage would be considered a high-quality forage at 64% TDN. Using some of the concepts on intake in the October 2006 "Ridin' Herd" column, a gestating cow will easily consume about 2.5% of her body weight on a DM basis of corn silage. If the cow weighs 1,200 lb., she could consume 30 lb. of silage a day on a DM basis. If the silage is 35% DM, this 1,200-lb. cow could eat 86 lb. of silage daily.

If she is fed a full feed of silage and the silage is 64.8% TDN, she could consume 19 lb. of TDN daily (30 lb. of DM × 0.648 = 19.44 lb. of TDN). If the 1,200-lb. cow is in the last one-third of gestation, her TDN needs are between 12 lb. and 13.8 lb. (average, 12.8 lb.) of TDN. So at a full-feed of silage, she is consuming more silage than is needed to meet her requirement. You could limit-feed corn silage to meet her energy requirement. In this example, feed her 57 lb. daily (19.8 lb. DM of silage × 0.648 = 12.8 lb. of TDN DM daily needed to meet TDN requirement; then 19.8 lb. of DM ÷ 0.35 DM of silage = 56.6 lb. of silage "as-fed") to meet her TDN requirement.

You probably don't want to limit-feed late-gestation cows to this degree. If you added 7 lb. of ground cornstalks (50% TDN, 5% CP, 88% DM) on a DM basis as a filler, these cows should gain body condition under typical winter conditions. In addition, energy requirement will be exceeded (12.8 lb. requirement, 12.8 lb. from silage, 3.5 lb. cornstalks) and CP requirement would be very close to being met (2.2 lb. per day required, 1.76 lb. from silage, 0.35 lb. from cornstalks) — close enough that I would not add any extra to the diet. Total DM intake would be 26.8 lb. per head per day. Add vitamins and minerals and, under typical weather conditions, the herd should perform well.

After calving more energy and protein will be needed in the ration.

Pricing drought-damaged corn silage

To estimate the value of drought-damaged silage, what do you need to consider? Start by comparing it to regular, high-grain corn silage. One common rule-of-thumb for pricing regular silage is that one ton of silage in the bunker silo is worth

10 times the price of a bushel of grain. Using this rule, when corn is worth $2.20 per bu., then regular silage is worth $22 per ton. Drought-damaged silage has lower feeding value than regular silage, but not as much lower as you might think.

Silage from corn producing 5 bu. per acre or less will still have 75% of the feeding value of well-eared silage. Corn producing 40 bu. per acre is worth about 95% that of regular silage. So, the value of drought-damaged silage in the bunker silo can be adjusted proportionately to regular silage using this information.

Feed value stays high during drought because leaves and stalks retain many nutrients that normally go into the grain. If the corn is still standing in the field, harvest costs must be considered. These can be as low as $4 to $5 per ton when yields are high and near the bunker silo, to more than $10 per ton for fields with drought-stricken, lower yields that are several miles from the bunker.

One final consideration might be to compare the silage to other potential feeds. With hay prices around $80-$100 per ton, corn silage may be worth a couple dollars per ton more this year than usual.

If you have ensiled drought-damaged silage, let it go through the 28-day fermentation period before opening up the pit for feeding. I would suggest testing the silage for moisture, percent CP, TDN and nitrates. Even though the ensiling process will reduce nitrates by 40%-60%, still consider testing for nitrates. Don't give up on your drought-damaged corn. It still can make some useful and valuable silage.

Final thought

Drought poses challenges to cow-calf producers because weather conditions have affected the amount of harvest feeds available due to reduced yields. One of the best harvest options for dryland corn grown in drought conditions is to harvest it as silage. Corn silage will fit into cow-calf diets when hay and alfalfa are priced high. If you have the equipment to deliver silage to the cow herd, consider this feed resource, as it may be the most economical feed that you have available.

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Editor's Note: *"Ridin' Herd" is a monthly column written by Rick Rasby, professor of animal science at the University of Nebraska. The column focuses on beef nutrition and its effects on performance and profitability.*