

Cost Per Nutrient



Higher feed costs may be with us for a while.
Producers are wise to compare feedstuffs on a cost-per-nutrient basis.

by **Troy Smith**

Not so long ago, alfalfa hay, silage and corn were staple feed resources for Profit Maker Bulls, near Paxton, Neb. Alfalfa had been readily available in the Platte River Valley, and manager Dave Bittner considered it to be one of the cheapest sources of protein for bull-development rations. Of course, that was when the price of alfalfa, ground and delivered, was \$70 per ton.

Last winter, Bittner paid that much for baled cornstalks. Alfalfa had nearly doubled in price. The price of corn climbed from \$2.25 per bushel (bu.) to as much as \$4.50 per bu. before it moderated in the spring. The increasing cost of those traditional feedstuffs forced Bittner to consider alternatives for formulating cattle rations that met nutritional requirements at a lower cost.

Added to the silage, baled cornstalks provided roughage and some energy. Distillers' grains supplied energy and protein, reducing the amount of corn used in the ration and eliminating the use of alfalfa or a commercial protein supplement. A relatively low-cost vitamin-mineral package filled in any remaining nutritional gaps. But, Bittner says, even more ration changes are coming.

Table 1: Cost comparison of typical protein supplements, dry-matter basis

Item	\$/ton	% crude protein	%/lb. protein
Molasses-base protein tub	400	16	1.25
Liquid protein supplement	230	35	0.33
Soybean meal	217	49	0.23
20% all-natural protein cube	215	20	0.54
Wheat midds	145	19	0.38
DDGS*	135	30	0.23
Corn gluten feed	130	20	0.33
Soy hulls	130	12	0.54
Sunflower meal	130	31	0.22
Alfalfa hay	115	20	0.29

*Dried distillers' grains with solubles.

A professional approach

"Typically, we have bought standing corn to cut for silage. What we pay is based on the price of corn (grain), so the cost of silage has become prohibitive. Starting this fall, we won't feed any silage," he explains. "We're looking at all the alternatives for creating a ration and using a professional [bovine nutritionist] to make sure we have the nutrient profile we need, for the least cost."

In this case, the professional is Mac Stevens, a nutritionist with Darling's Nutrition Co. Stevens says increasing prices of grain and forage present challenges to

Source: Karl Harborth, Kansas State University.

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all types of cattle operations. Hoping to pare down their feed bills, feeders, stocker operators and cow-calf producers are looking harder at alternative feed resources.

But, incorporating some nontraditional feed resources, such as distillers' grains or other byproduct feeds, can make ration formulation complex. Professional help may be advisable. Even if producers choose to do it themselves, they should take a professional approach to evaluating the true cost of specific nutrients.

"A lot of producers don't look at the cost per unit of protein or energy," Stevens laments. "They may be feeding expensive protein or energy supplements in excess, or there might be alternatives that will supply what's needed at a lower cost."

For years, livestock specialists like Kansas State University's Karl Harborth have lectured to producers about the nutrient value variability of purchased and home-raised feedstuffs. The only way to know what nutrient levels are, harped the experts, is to have feed ingredients tested. Now, high feed prices are driving home the lesson.

"When hay is costing \$90 a ton, or more, you better know what the quality really is," Harborth says. "Know what you have and what it is lacking, so you can determine what type of supplementation is needed to meet your animals' nutrient requirements. Then, regardless of the type of supplements needed, you should purchase them in a nutrient-dense form. And compare prices on the basis of the cost (per unit) of the specific nutrient."

Whether building a complete ration from scratch or providing a little supplemental protein to grazing cows, producers need to calculate true feed costs to realistically compare feed resource alternatives.

Consider per-unit cost, convenience

Assume, for example, that cattle are consuming hay or grazed forage with a protein content that falls short of animal

requirements. When considering a protein supplement, Harborth advises producers to evaluate the options according to the cost of each pound of protein they contain. And make sure comparisons are made on a dry-matter (DM) basis.

Table 1 (see page 79) shows how some protein supplements appear to be more expensive based on a "per ton" price but may be an economical choice on the basis of cost per pound of protein. However, costs associated with transportation, storage and feeding the supplement have to be considered, too, since they can add to the total cost of the supplement used.

The table also reveals the

added cost of convenience. Protein tubs may be well-suited to certain situations, where frequent feeding of supplemental protein isn't practical. A "self-fed" delivery system certainly is convenient and may make tubs the best choice, even though the price per pound of protein is higher than alternative sources. However, Texas A&M University Extension Beef Cattle Specialist Jason Banta advises producers to think hard about their reasons for choosing a particular supplement.

"The cost of convenience is normally very high. Depending on price and nutrient content, producers can generally purchase two to three times more protein and/or energy when buying cubes, compared to tub products," Banta offers.

Of course, not all cubed supplements are alike either. Manufacturers typically offer choices based on protein content. According to Banta, the differences also illustrate the importance of calculating cost per unit of nutrient. Let's assume a feed supplier offers cubes containing 20% protein priced at \$6.25 per 50-pound (lb.) bag. That product's cost per pound of protein is slightly more than 62¢. If 40%-protein cubes cost \$7.50 per bag, their cost per pound of protein is approximately 38¢.

If the producer needed to supply 0.8 lb. of supplemental protein per head daily, to meet animal requirements, it would take 4 lb. of the 20% cubes, costing 50¢ per day. Feeding 2 lb. of the 40% cubes would suffice, at a cost of 30¢ per day.

Considering today's higher fuel prices, producers should remember that protein supplements don't have to be fed each and every day. Cows grazing crop residues or winter range, for example, can be fed protein cubes on alternating days or just three times per week as long as the amounts fed meet the animals' average daily requirements.

Analyze feed labels

"When comparing energy supplements, it may be a little more difficult to make a direct comparison, because TDN (total digestible nutrients) or another unit for describing energy content may not be included on the feed tag," Banta warns.

In such cases, he advises producers to look at the crude fiber and crude fat values to compare energy levels. As the concentration of crude fat increases, the energy level of the feed increases. However, as the concentration of crude fiber increases, the energy level of the feed declines.

"For example, if two supplements were the same price and both contained 20% crude fiber, but one contained 2% crude fat and the other contained 5% crude fat, you would want to purchase the one with 5% crude fat, because it contains more energy," Banta explains.

"Some feed companies have started to report more detailed nutrient analysis for their products on the Internet. Although the feed tag may not list the TDN content, this information may be obtained from the company's web site so that a more accurate comparison of feeds can be made. If the TDN content for a feed is available, then price per unit of TDN should be calculated," he adds.

Weighing options

Harborth says limit-feeding cows with corn has long been considered a viable alternative

Table 2: Cost of energy (TDN) based on hay quality and price, and corn price

	Hay price, \$/ton	Hay price, \$/ton TDN	Corn price, \$/ton TDN	Corn price, \$/bushel
Low-quality hay (45% TDN):				
	50	111.11	100.20	2.50
	70	155.56	140.39	3.50
	90	200.00	180.51	4.50
Average-quality hay (53% TDN):				
	50	94.34	100.20	2.50
	70	132.08	140.39	3.50
	90	169.81	180.51	4.50

Source: Karl Harborth, Kansas State University

when hay supplies are limited and prices are high. Granted, a certain amount of grain handling and feeding equipment is necessary, and it is more management-intensive, but many producers have withstood periods when forage was expensive by relying more on corn as a source of energy.

“It looked pretty good before corn prices started climbing. Now, even high-priced hay may be cheaper to feed than corn,” Harborth states.

When does corn become too expensive to be considered an alternative energy source? Harborth says it depends on the price of corn, of course, but also the quality of hay it might replace. Table 2 shows the cost of energy, expressed in dollars per ton of TDN, associated with corn and hay at various prices. Both average- and low-quality hay values are included for comparison. Even at \$90 per ton, average-quality hay’s cost per

ton of TDN compares favorably with corn costing more than \$4 per bu.

The ethanol industry is credited for boosting grain prices, but that industry also provides the means by which growing numbers of cattle producers mitigate the resulting higher feed costs. The availability of ethanol byproducts, like distillers’ grains, is increasing as the industry grows. Corn gluten feed and other byproducts of cornstarch and sweetener production also serve as sources of both protein and energy.

These products are touted as affordable alternatives to supply basic nutrients to livestock diets, but prices are tied to the corn market and can change accordingly. Producers whose operations are located nearer to where byproducts are produced have a definite advantage due to

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lower shipping costs. Storing and feeding “wet” distillers’ grains or corn gluten feed, as well as liquid syrup or steep liquor, presents certain challenges and associated costs, too. The challenges might be overcome by purchasing dried distillers’ grains (DDGs), for example, but the price of any product that’s easier to store or feed will reflect the manufacturer’s investment in further processing.

Calculate true costs

So, whether building a complete ration from scratch or providing a little supplemental protein to grazing cows, producers need to calculate true feed costs to realistically compare feed resource alternatives. Testing forages and feed ingredients for nutrient content will help match feed resources to animals’ nutrient requirements. And comparing feed resources, including purchased supplements, according to their cost per unit of specific nutrient should reveal the most economical choices.

