Ridin' Herd

► by **Rick Rasby,** *extension beef specialist, University of Nebraska*

Start planning for winter feeding program

Profitable cow-calf producers tend to have three important items in line with one another: weaning weight in line with reproductive rate in line with cost of producing a weaned calf. Weaning weight and reproductive rate will likely not be maximum, but optimum given the feed, labor and capital resources available. In addition, maximizing the use of winter and summer grazing opportunities and using harvested and commercial feeds at the "proper" time are important in making the cow-calf enterprise profitable.

Harvested forages

In many operations, at some point in time during the winter, harvested forages will be used before and/or after calving. Forages available can differ tremendously in quality. "Average" quality alfalfa is 16% crude protein (CP) and 55% total digestible nutrients (TDN). Corn silage averages 8% CP and 69% TDN.

A dry, pregnant, mature cow requires 7%-8% CP and 50%-56% TDN before calving.

Feeds like cane hay, sorghum silage, wheat hay and wheat straw provide slightly different average values. "Average" values provide only part of the story on forage quality. Forages of differing quality can be targeted in a feeding program to reduce cost by knowing if, when, how much and what kind of additional feed is needed. Are the bales of grass hay in the stack yard 50% TDN or 58% TDN?

Relative value of supplements

Regardless of your situation, re-evaluate your supplementation program from a cost standpoint to determine if current supplementation strategies can be justified. A good place to start when evaluating protein sources is to evaluate them on their nutrient content. Comparing feeds based on nutrient content tells which are the best value. Also, compare feed of different moisture contents at a 100% dry-matter basis.

When comparing sources of supplemental protein or energy to feed the herd, calculating the cost of the supplement on a per-pound-of-protein or per-pound-of-energy basis

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Example 1: Purchase cost by nutrient for feedstuffs that have the same moisture/dry-matter contents

Protein source	Alfalfa hay (good)	Dried distillers' grain (DDG)
Cost (as-is basis):	$80.00 per ton	$183.00 per ton
DM	90%	90%
CP	17%	30%
TDN	57%	108%

Alfalfa hay

Cost per pound (lb.): $80.00 per ton (2,000 lb.) = $80 ÷ 2,000 = $0.040 per lb.

Cost per pound of DM: $0.040 ÷ 0.9 (DM content) = $0.044 per lb. of DM

Cost per pound of protein: $0.044 ÷ 0.17 (protein content) = $0.26 per lb. protein

Cost per pound of energy: $0.044 ÷ 0.57 (TDN content) = $0.077 per lb. of TDN

DDG

Cost per pound: $183.00 per ton (2,000 lb.) = $183 ÷ 2,000 = $0.092 per lb.

Cost per pound of DM: $0.092 ÷ 0.9 (DM content) = $0.102 per lb. of DM

Cost per pound of protein: $0.102 ÷ 0.30 (protein content) = $0.34 per lb. protein

Cost per pound of energy: $0.102 ÷ 1.08 (TDN content) = $0.09 per lb. of TDN

Example 2: Purchase cost by nutrient for feedstuffs that have different moisture/dry-matter contents

Protein source	Alfalfa hay (good)	Wet distillers' grain (WDG)
Cost (as-is basis):	$80.00 per ton	$70.00 per ton
DM	90%	35%
CP	17%	30%
TDN	57%	108%

Alfalfa Hay

Cost per pound: $80.00 per ton (2,000 lb.) = $80 ÷ 2,000 = $0.040 per lb.

Cost per pound of DM: $0.040 ÷ 0.9 (DM content) = $0.044 per lb. of DM

Cost per pound of protein: $0.044 ÷ 0.17 (protein content) = $0.26 per lb. protein

Cost per pound of energy: $0.044 ÷ 0.57 (TDN content) = $0.077 per lb. of TDN

WDG

Cost per pound: $70.00 per ton (2,000 lb.) = $70 ÷ 2,000 = $0.035 per lb.

Cost per pound of DM: $0.035 ÷ 0.35 (DM content) = $0.10 per lb. of DM

Cost per pound of protein: $0.10 ÷ 0.30 (protein content) = $0.33 per lb. protein

Cost per pound of energy: $0.10 ÷ 1.08 (TDN content) = $0.09 per lb. of TDN

is key. A description on how to calculate these values is illustrated in Example 1 and Example 2.

An Excel template titled *The Feed Cost Cow-Q-Lator* allows producers to make protein and energy supplementation comparisons easily through simple value inputs. The Ag Manager's tool can be found online at *http://westcentral.unl.edu/agecon3.*

Discussion of crude protein concepts

In the past, crude protein had been used in balancing rations. It has long been recognized that the crude protein system had some flaws. It is also known that the rumen microorganisms in beef animals have nitrogen or protein needs, yet the animal has protein requirements for maintenance of the digestive tract, nervous system, muscle structure, etc., plus muscle growth. The crude protein system only assumed one requirement for the entire animal. The crude protein system worked relatively well as long as the limitations were recognized and appropriate adjustments were made.

The 1996/2000 National Research Council (NRC) requirements use metabolizable protein and established separate requirements for the rumen microorganisms and the animal. Metabolizable protein is the protein that reaches the small intestine and is made up of microbial protein (protein that is made by rumen microorganisms) and rumen undegraded protein (RUP).

In the past, RUP has been referred to as bypass protein, or the protein that escapes or bypasses the rumen microorganisms without breakdown. In the small intestine, protein is digested efficiently, similar to digestion in monogastric animals.

The requirements for the rumen microorganisms is referred to as rumen degraded protein (RDP) and comes from protein that is digested or broken down in the rumen. It is important that the RDP requirement be met to provide a high level of microbial activity and to assure optimum levels of fiber digestion.

Some of the RDP can come from nonprotein nitrogen (NPN) sources such as urea. The amount of NPN that is utilized in high-roughage diets for bacteria protein synthesis continues to be debated. It is known that urea breaks down at a much faster rate in the rumen than carbohydrates are broken down in forages. Because of the lack of synchrony, one would not expect the nitrogen from NPN to be utilized as effectively as nitrogen from natural proteins, which break down more slowly.

The debate will continue on how efficiently NPN will be utilized under the various conditions encountered with the range beef cow. Even though many trials have been conducted to determine NPN utilization, the committee that published the 1996/2000 requirements simply stated, "Until more information is available, it is advisable to use caution when using urea in low-protein, high-forage diets." Tables are available to give estimates of RDP and RUP for many feeds used in ration formulation.

Final thoughts

- Test forages for crude protein, energy (TDN) and moisture because they can vary in nutrient content.
- Target feeds for best use — use lower-quality feeds before calving and higher-quality feeds for young females and cows after calving.
- Supplement as needed, and price supplements based on nutrient needed.

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