

Vet Call

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Meeting the Protein Needs of Cow Herds

The second most expensive nutrient in a cow herd nutrition program after forage is protein. Adding to its importance is the fact protein is the most likely major nutrient to be purchased off the farm. Protein is required not only in growing animals, but also for cows in all stages of production.

Protein plays a major role during lactation to affect quantity and quality of milk produced. Protein is also important for its role in enhancing appetite, which alters the level of forage intake and therefore, the level of energy that an animal consumes.

Research has shown that low protein consumption the last 60 days of pregnancy is associated with the weak calf syndrome which is a perennial problem in all parts of the country. Because of its importance, producers need to consider protein in the initial formulation of cow diets.

By dividing the year into four production periods illustrating the differences in protein requirements between the periods, producers can more readily recognize those times of the year when protein supplementation is critical and other times when forages should provide the necessary levels.

■ Figure 1

	Period 1	Period 2	Period 3	Period 4
	80 days	125 days	110 days	50 days
	post calving	pregnant & lactating	mid-gestation	pre-calving
protein level lbs/day	2.5	2.1	1.5	1.8

Figure 1 is an example of the protein needs of a 1,100 pound cow that gives 15 pounds of milk daily when lactating. Requirements are based on NRC minimum levels plus 10 percent. Increases in milk production and cow size both increase the protein requirement in the diet. For each 100 pound increase in body weight, protein requirements increase 6 to 8 percent. For each five-pound increase in daily milk production, protein requirements increase 13 to 15 percent. For spring calving herds, protein requirements in period 2 are met by grazing growing forage. Protein supplementation is often necessary for at least part of the other three periods.

Some common mistakes in feeding protein to beef cows are:

Over-feeding protein during mid-gestation

A typical 1,100 pound cow of average producing ability will need only 1.5 to 1.7 pounds of crude protein during the middle part of gestation. However, in many cases, producers will feed a roughage of fair quality, 8 to 10 percent crude protein, during this period that should meet both energy and protein requirements, but then also feed a protein supplement, which is not needed.

Under-feeding protein after calving

After a cow calves, her requirement for protein increases greatly. For a 1,100 pound cow producing 15 pounds of milk, the requirements are 2.5 pounds of crude protein daily; If that cow produces 20 pounds of milk, protein level needed is increased to 3.0 pounds.

Misuse of non-protein nitrogen (NPN) or urea

Urea is an inexpensive source of nitrogen. In many cases, it can be fed successfully to cattle, particularly feedlot animals. In most herd nutrition programs, even when forage is limited or of low quality, urea can still be utilized as part of the protein source. Producers should be aware, however, that when high levels of urea are fed concurrently with low quality forages, a negative response to the protein supplement can occur, causing weight loss and subsequent reductions in weaning weights and reproductive performance. In order for urea to be successfully utilized, it must be accompanied by adequate energy and fed to cows being maintained in a positive energy balance.

Before you select a protein supplement, it's imperative you have your harvested forages analyzed for energy and protein content every fall. Be sure to evaluate different cuttings of hay and hay from different fields separately so you know the nutritional value of each forage before you feed it. Use this information to decide which hay to feed to mid-gestation cows, the lowest quality hay; which to feed to first-calf heifers in mid-gestation, medium quality and which to feed to all females pre- and post-calving, the highest quality hay.

It's unfortunate, but true, that you can't tell hay quality by looking at it, other than the exception of badly weathered hay. The \$50 or so that you spend for forage analysis will more than be repaid when you know if and when you need to supplement protein.

Protein sources can be alfalfa hay; soybeans (cows can eat raw soybeans); soybean meal; wheat middling, a by-product of milling; cottonseed meal; commercial cubes; tubs with urea/molasses; or protein blocks. Protein sources should be evaluated on a cost per pound of protein basis.

Alfalfa hay often calculates out as the cheapest protein source but, you must have the equipment to handle it and transportation costs must be low. Protein blocks and tubs usually calculate out as the most expensive, but most convenient source. By-products such as wheat middlings and cottonseed meal must often be purchased in semi-truck loads to get the best deal, but are an excellent source of inexpensive protein.

Two of the keys to profitability in the cattle business are directly related to protein feeding. The first is to optimize your feeding expenses by avoiding over-feeding of expensive protein supplement when they are not needed. The second is to optimize reproduction and calf viability by not under-feeding protein at critical time. By forage testing, working with your veterinarian or nutritionist and comparing your protein supplementation options for competitive pricing, you can optimize your feed expenses without sacrificing reproduction or animal health.