

LOW COST COW/CALF PROGRAM

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Dormant Season Protein

Going into the dormant season, forage nutrient quantity begins to decline. As the toasting proceeds, various nutrients decline at different rates. For the most part, fermentable energy tenaciously holds its own for a while then starts a slow decline; it bottoms out just before green. Protein, meanwhile, starts south immediately upon the loss of any green from leaves and tanks just before new growth. This discrepancy between the levels of dietary energy and crude protein is the biggest nutritional problem confronting the Rancher. In a low-cost program, the only nutrient that is affordable (when limiting the cow's performance) is fermentable energy. If more energy than that which is produced by the land is to be made available, spending big money becomes a necessity. It also is imperative to utilize all of the energy that the land **does** produce. Land cost is the same whether it is well utilized or not at all.

The Role of Protein

Fermentation of the fermentable energy by rumen microorganisms can be limited by insufficient quantities of other nutrients. "Man Must Measure" the levels of crude protein and macro and micronutrients contained in the forage to know if they are present in sufficient quantities to support maximum utilization of the fermentable energy. Generally, a quite simple mineral supplement can be built to supply that which is lacking from the forage. A major complication with this "simple" program is supplying the protein. The rumen microorganisms require a quantity of dietary degradable protein that is in direct proportion to the level of fermentable energy. If there is a deficit of degradable protein, forage energy utilization will not be maximized and thus, expensive land will go to waste. With an oversupply of degradable protein, relative to fermentable energy, excess ammonia will result, which must be detoxified in the liver--an energy-requiring process.

Sources of Degradable

Forage itself is the major source of crude protein that makes up the critter's diet. The degradable protein portion of the

crude protein can be and is argued. It depends upon plant species, plant parts, stage of growth, etc. It generally runs from about 65% to 90%. Since supplements cannot be changed frequently, we must pick a number and go with it. We use a value of 80%--others use a similar value. Further, rumen microbes are not 100% efficient in utilizing dietary degradable protein. As others have, we use a 90% efficiency factor. After doing all of this and that, we say that 72% of forage crude protein can and will be degraded. When it comes to supplemental degradable protein, ranchers commonly turn to the oilseed meals. The meals differ in their degradable protein content. Soybean and canola meals are similar in that high proportions of their crude proteins are degradable. Not so with cottonseed meal. Its crude protein is degraded poorly. The crude protein in ingredients containing only non-protein-nitrogen (NPN) is 100% degradable. The most common of these is urea.

How to Deliver

With adequate forage nutrient composition data, we've managed quite well to formulate supplements containing only the quantity of nutrients that are lacking in the forage. The summation of the quantity of ingredients supplying the daily nutrient requirement is the amount consumed by the cattle each day. This works well until a degradable protein deficiency pops up. When an oilseed meal is fed as part of the mineral supplement, control of consumption can be lost. Over consumption commonly occurs as forage quantity declines - during periods of severe cold and when the degradable protein requirement is not satisfied in the first place. Some Ranchers choose to limit feed the oilseed meal separately from the mineral. Pellets or cubes frequently are spread along a path or a high level of salt is blended into the meal and the mix is offered free choice. (*In the School we discuss the disastrous results of salt limiting*). For the most part, the degradable protein deficiency can be satisfied with supplemental urea in the total mineral blend. Problems can and do arise. It is well recognized that urea can be toxic. Urea-containing supplements must be managed carefully. Urea will dissolve in

water so the feeders must drain. The supplement manufacturer must use a small urea prill so that there is no segregation from the other crystalline ingredients. The cattle should not be without supplement. When re-supplied, over consumption may occur. **There are other precautionary steps to take.** The overwhelming problem occurs when the urea is not in sufficient quantity to satisfy the degradable protein deficiency. Over consumption of the entire supplement often occurs. Our solution has been to continually increase the level of urea. Montana State U¹ delivered degradable protein, from a lick-wheel feeder, in a molasses-based liquid. The cows consumed about 1.2 lb of degradable protein (0.4 lb urea) daily, each year of a two-year study. The native-range-winter forage was low quality (<6% CP and >77% NDF). Dry matter forage consumption was 24.5 lb for the unsupplemented controls and 35.3 lb for supplemented cows during the first year. There was only a small difference in forage consumption the second winter. The authors suggest that reduced performance may have been the result of lower forage availability, due to substantially higher snowfall. **There is a direct relationship between energy consumed and degradable protein required.**

¹Sowell, B.F., J.G.P. Bowman, E.E. Grings and M.D. MacNeil. 2003. Liquid supplement and forage intake by range beef cows. *J. Anim. Sci.* 81:294.

Rumors

*Thanks for all you do for our industry!
It sure has made a difference for us.
Thanks, Carolyn AlmWyoming*

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