



Ridin' Herd

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Mineral supplementation programs

Commercial cow-calf producers know minerals are important to the animal; many chemical reactions require them to be present. With input costs continually on the rise, the question by producers is what mineral(s) should be the focus, and how can these minerals be provided economically? These are good questions, and they are not easily answered.

Producers note the wide range in cost of the mineral supplementation programs they hear and read about. A mineral program that fills the gaps in minerals needed compared to minerals supplied is only a component of a complete nutrition program that lends itself to production and reproductive performance optimums for a ranch. An understanding of some basic principles will help meet the challenge of selecting a mineral supplementation program. One thing is for certain: No one program fits all production systems.

Minerals in a nutrient plan

Researchers have conducted a multitude of experiments using different mineral supplementation strategies to evaluate their importance in a cow-calf enterprise and their effect on performance and productivity. When conducting mineral research, the challenge using beef cows is that cows are, for lack of a better word, elastic. When the feeds a cow consumes are higher in minerals than what she needs, she has this ability to store them and then mobilize them when the forages or feeds are not adequate to meet her needs.

For example, calcium (Ca) and phosphorus (P) are stored in bone. If times get really tough, a cascade of hormone events can occur in the cow, and Ca or P can be mobilized. This doesn't happen often, but the mechanism is there as a safeguard for the animal because of the importance of the two minerals.

Similarly, the liver is a storage vat for some of the microminerals, such as copper (Cu). This source can be mobilized when blood copper is low.

A number of important minerals interact with one another, and these interactions make research difficult to conduct and interpret. For instance, a high level of molybdenum (Mo) has a negative effect on Cu absorption.

High potassium (K) can have a negative effect on magnesium (Mg) uptake. In this situation, if cattle are grazing a pasture where grass tetany is a concern, cattle may experience grass tetany even though Mg supplementation or intake may be adequate.

Though understanding minerals and their interactions can be complicated, it doesn't mean producers should throw up their hands and forget about this part of the nutrition program. A mineral supplementation program must be designed to fit the needs of the cow herd and, at the same time, be economical.

Selecting a mineral program

Choosing a mineral program doesn't have to be complex.

First, protein and energy components of the nutrition program affect the mineral supplementation program. Proteins in the cow's system help in the absorption, transfer and metabolism of minerals and are critical in maintaining the absorption of minerals by intestinal tissue. This doesn't mean you should overfeed protein, but it illustrates that an effective mineral program has to be in unison with a total nutritional program for the beef cow herd.

Second, it is important to have a reference that shows the cow's requirement and how mineral needs change as she moves from one phase of production to the next — from gestation to lactation, for instance. The best resource is the *2000 Nutrient Requirements for Beef Cattle* published by the National Research Council (NRC).

For most minerals such as calcium, phosphorus and sodium, ranges are provided along with a "maximum tolerable level." If the mineral is consumed above the maximum tolerable level, toxicity can occur.

Third, effective mineral decisions must include an estimate of minerals provided in

the diet the cow is consuming (forages, feeds, etc.). Mineral content in forages can vary from location to location. If the soil is deficient in a mineral, there is a high likelihood the forage will be low in that mineral. When cattle are grazing, they select a diet that is higher in quality than would be selected by a person taking a clipped sample of the same forages. So, determining the minerals and amounts the diet is supplying is a challenge.

Many state universities or county extension educators have collected forage samples in locations across their states and have started a library of mineral content of many of the forages that populate their state. Contacting the university or extension educator in your state to see if a library exists is strongly encouraged before getting into extensive forage testing at your location. These values are better than "book values." Determine mineral intake for the total diet consumed, including water.

A mineral supplementation program should be simple, economical and meet the needs of the cow herd as they change from one phase of production to another and as they change diets (grazed pastures to harvested forages). These kinds of strategies have a good chance of being implemented.

Calcium and phosphorus are probably the two minerals on which most cow-calf producers should focus, especially when feeding harvested forages and before and during the breeding season. *Do not* overfeed phosphorus because it is usually the most expensive component of a mineral supplement.

Always have salt available for the cow herd. Some producers have included a trace mineralized salt in some situations. If you manage cattle in a situation where trace minerals are needed, there are commercial mixes available. Feed only what is needed and not supplied by the diet. Read the tag for the levels that should be consumed by the cow on a daily basis. For most mineral supplements and the self-mixed mineral supplements, 2-3 ounces (oz.) per head per day is a typical intake.

Finally, if your cows graze pastures in the springtime where grass tetany is a problem, supply a mineral that contains magnesium oxide. Begin this supplementation at least

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30-45 days before grazing these pastures. Magnesium is not very palatable, so these supplements contain ingredients that will entice cattle to consume the mineral. Read the tag to determine what daily consumption should be. Most grass tetany mineral programs will require cattle to consume 6-9 oz. per head per day. Oversupplementation of potassium can trigger grass tetany. Because grass tetany can occur when calcium is low, the tetany mineral needs to contain calcium.

Final thoughts

Mineral supplementation programs in many situations don't have to be complicated, but it is hard to make a blanket recommendation for cattle. Work with your extension educator, beef specialist, nutritionist or feed store to develop the program that is economical and fits your needs. Remember, an efficient mineral program considers the total nutritional requirements of the cow.



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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.