



Ridin' Herd

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

Mineral supplementation strategies

Minerals are important in diets of beef cows because many chemical reactions in the body require them to be present. Feed costs are the greatest component of annual cow costs. Producers ask what mineral or minerals should be focused on and how they can be provided economically. These are good questions and not easily answered because minerals needed can differ from ranch to ranch.

The cost of mineral supplements can vary a lot. A mineral program that fills the gaps in minerals needed compared to minerals supplied by the base diet, which is mostly forage/grass, is only a component of a complete nutrition program that lends itself to optimal production and reproduction performance. Understanding some basic principles will help you select a mineral supplementation program that best fits your ranch or production system. One thing is certain: No one program fits all the different beef cow-calf production systems.

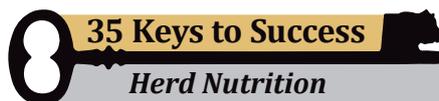
Challenges

A multitude of experiments using different minerals to evaluate their importance in a cow-calf enterprise and their effects on performance and productivity have been conducted. The challenge with mineral research is that minerals interact with one another, and some minerals can be stored by the animal for use when what they are eating does not meet their need for that particular mineral.

At times, when feeds the 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. In feeding situations where the requirement is not met, a cascade of hormonal events can occur in the cow and Ca or P can be mobilized from bone and used by the cow. This doesn't happen all that often, but the mechanism is there as a safeguard for the animal because of the importance of Ca and P.

In addition, the liver is a storage vat for some of the microminerals, for example copper, and this source can be mobilized when blood copper is low. Not all minerals can be stored when consumed in excess.

There are some important minerals that interact with one another, and these interactions make research difficult to conduct and interpret. As an example, high molybdenum (Mo) has a negative impact on copper (Cu) absorption. Also, high potassium (K) can have a negative impact 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.

Just because 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 strategy must be designed to fit the needs of the cow herd and, at the same time, be economical.

Selecting a program

Choosing a mineral program doesn't have to be complicated. First, protein and energy components of the nutrition program affect the mineral supplementation program. Proteins that are consumed by the cow help in the transfer and metabolism of minerals and are critical in absorption of minerals by intestinal tissue. This by no means indicates 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 the cow changes from one phase of production to the next, as in gestation to lactation. The best resource for mineral nutrient needs is the *2000 Nutrient Requirements of Beef Cattle* published by the National Research Council (often referred to

as the NRC for Beef Cattle). Producers will notice that for most minerals such as calcium, phosphorus and sodium, ranges are provided and there is a "maximum tolerable level," which means if the mineral is consumed above this level, toxicity can occur.

Third, an effective mineral supplementation program must include an estimate of minerals provided in the base diet (forages, feeds, etc.) that the cow is consuming. Mineral content in forages can vary from location to location. In many cases, if the soil is deficient in a mineral, there is a high likelihood that the forage will be low in that mineral also.

In addition, when cattle are grazing, they select a diet that is higher in quality than would be selected when a person takes a clipped sample of the same pasture, which makes determining the amount of each mineral the diet is supplying a challenge.

Many state universities or county extension educators have collected forage samples in many locations across their states or counties and have started a library of mineral content of many of the forages that populate their state/area. Contact the university or extension educator to see if a library exists, as these values are better than "book values." Also, there are minerals in the water that the cow consumes, and they need to be included in her dietary intake.

A mineral supplementation program should be simple, economical and meet the needs of the cow herd as it changes from one phase of production to another, and as it changes diets (grazed pastures to harvested forages). 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; it is usually the most expensive component of a mineral supplement. In some areas, producers will need to include some other minerals to the mix and may also need to include some trace minerals to the supplement. Always have salt available for the cow herd. Read the tag for the levels that should be consumed by the cow on a daily basis.

For cattle grazing cool-season pastures early in the growing season, grass tetany

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could be a problem. Supplement magnesium oxide to manage grass tetany. Begin this supplementation at least 30-45 days before grazing these pastures and continue until growing conditions of the cool-season grass become stabilized, which is usually 10-14 days into the grazing season. Most feed stores have a "grass tetany" mineral mix. Read the label to see how much cattle are supposed to consume daily. Most grass-tetany mineral programs will require cattle to consume 6-9 ounces (oz.) per head per day.

Again, 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 because conditions vary from ranch to ranch. Work with your extension educator, beef specialist,

nutritionist or feed store to develop the program that is economical and fits your needs. The nutrition program is related to productivity of the cow herd.



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