



The Veterinary Link

by **BOB LARSON**, professor of production medicine, Kansas State University

Cow herd mineral supplementation

When I think about meeting the nutritional needs of beef cow-calf herds, I first focus on the ability of the base forage to meet the energy and protein needs of the various groups of cattle that differ by age and lactation status on the ranch. Another aspect of nutrition that must also be considered is the mineral content of the diet. The minerals available from grazed and harvested forages and feed depend greatly on the soil in which it is grown, as well as the type of plant being consumed.

Mineral needs

Because of the importance that soil plays in the availability of many minerals, supplementation needs can vary greatly across North America. In addition, mineral needs (particularly calcium and phosphorus) will increase somewhat in late gestation and, to a greater extent, during lactation compared to non-lactating cattle (heifers, dry cows, bulls).

Several minerals are necessary in beef cattle diets to maintain optimum health, reproduction and growth. Minerals

needed in relatively large amounts are described as major or macro minerals, while minerals needed in small amounts are usually called micro or trace minerals.

The major minerals that most commonly need to be supplemented in beef cattle diets are sodium (salt), calcium and phosphorus, while magnesium and potassium are major minerals that require supplementation under certain circumstances. The six trace minerals that may be deficient in forage-based diets are copper, cobalt, iodine, selenium, zinc and manganese.

The mineral needed in the greatest amount in beef diets is salt (sodium chloride). Because salt is deficient in most natural feeds, it should be supplemented in all situations. The level of salt needed can vary depending on the diet, type of cattle and environmental conditions, but a general rule is to supply 1 to 2 ounces (oz.) per day.

Calcium and phosphorus are often considered together. Calcium content of grass decreases somewhat as forage matures and becomes dormant, but

Because salt is deficient in most natural feeds, it should be supplemented in all situations.

often maintains levels that supply dietary needs throughout the year. Phosphorus, however, is leached out of dormant forage, so that by mid-winter, levels are much lower than while forages are growing. Grains and many byproduct feeds used to supplement cows on dormant forage such as wheat middlings, soybean products, distillers' grains and corn-gluten feed have high phosphorus content that will likely provide sufficient levels in the diet.

The Coastal Plain of Texas and other portions of the Gulf Coast, the Sandhills of Nebraska, Montana, portions of Minnesota, North Dakota, and areas in numerous other states have phosphorus-deficient soils and diet supplementation should be a priority. In many other parts of the country, phosphorus deficiencies are seldom identified and phosphorus supplementation is not needed or can be strategically planned for the period of high demand (late gestation and early lactation).

Mineral management

Deficiency of magnesium is identified as a condition known as grass tetany. Observed most frequently in the early spring, grass tetany results from the consumption of lush forage, which has low levels of magnesium and sodium and has an excess of potassium.

In addition to plant factors, grass tetany is associated with late pregnancy and early lactation due to the movement of calcium, phosphorus and magnesium out of blood circulation and into the udder for milk production. During periods when grass tetany is a danger, a mineral mix with at least 18% magnesium needs to be offered. Because cattle do not like the taste of magnesium oxide, dry molasses or other flavor enhancers should be added to the mineral mix.

Minerals needed in small amounts are called trace minerals. In most situations requirements are met with grazed forages or supplemental feedstuffs. However, deficiencies or imbalances can occur when cattle grazing on some soil types consume plants that are either deficient in some important trace minerals or have excessive amounts of minerals that will tie up or prevent the proper utilization of other minerals. For example, iron, nitrate, sulfate, protein and plant estrogens are known to reduce copper utilization.

The first priority in trace mineral nutrition is to reduce the intake of antagonists to minimize the amount of supplemental mineral required. Changing water sources, rotating pastures so that animals are not on pastures with high levels of antagonists for long periods of time, or changing harvested forage sources may accomplish this.

Commercial mineral supplements are widely available and will meet the needs of most classes of cattle. The amount of each mineral provided by commercial products must be printed on the label. In some situations (due to concentrate feeds used and soil type), no commercial supplement is available to perfectly meet a herd's mineral needs. In these situations, custom mixes can be created. The supplier of the supplement will work with the producer to provide the proper level of minerals based on analysis of the animal's diet.

Salt and other minerals can be delivered to cattle in several forms. If possible, minerals can be mixed into hand-fed protein or energy supplements so that all cattle are more likely to receive their allotted amount. If no supplement is being fed, or if it is difficult or impossible to add minerals to the supplement, salt/mineral can be offered free choice in a loose granular form or as a block or tub (or other solid or semi-solid form).

All free-choice methods of mineral delivery will likely result in some cattle consuming far more and others far less than the desired amount. It has been reported that supplying salt/mineral in a loose form results in the highest intake, but because of loss to wind and weather or because of other convenience factors, a solid or semi-solid form may be more appropriate in some situations. Many commercial protein supplements — whether in a pellet, cake, tub or liquid form — have salt and other minerals added so that additional mineral supplementation is not needed.

Because cows do not have the nutritional wisdom to consume the proper amount of free-choice mineral supplement to meet their dietary requirement or to avoid toxicity, it is important to monitor mineral intake. Determining the amount of mineral consumed over several days is necessary to know the herd's average consumption. If consumption is too low, intake enhancers such as dry molasses, wheat midds, cottonseed meal or flavoring may be added. If consumption is too high, salt may be used to limit intake to desired levels.