

Free-Choice Minerals Are Important for Calves, Too

Many producers provide minerals to the cow herd to enhance cow fertility and productivity. But minerals are just as important for calf performance. Here's why.

by Sue Gordon

Research indicates a calf that receives trace minerals prior to entering the feedlot tends to wean off heavier and to stay healthier once it is put on feed.

"We've found that when calves are put into a stressful situation, such as commingling or entering the feedlot, their immune system doesn't work as well if they are deficient in certain trace minerals," says John Maas, Extension veterinarian, University of California-Davis School of Veterinary Medicine.

The bottom line is that cattle that are deficient in certain minerals are more susceptible to diseases, do not respond normally when vaccinated, and cost more money to treat, Maas says.

For example, severe selenium, zinc and copper deficiencies among calves often result in decreased feed intake, reduced efficiency and lower weight gains. A zinc deficiency can also lead to increased foot problems. Moderate deficiencies of these minerals can be harder to recognize but cause similar symptoms. Hence, a deficiency in minerals often may be the underlying cause of poor performance in the feedlot.

Minerals to watch

Which minerals are most important for peak calf performance? Unfortunately, there is no exact recipe for mineral supplementation. Maas points out that mineral deficiencies vary, depending on forage quality, soil factors, region of the country, time of year and even type of animal.

As an example, plants don't require several of the trace minerals (selenium, for example) for growth, but cattle do. So, unless the soil has some selenium in it that the plant will capture, cattle will likely be deficient in that trace mineral. Moreover, as cattle are bred for better performance — higher reproductive rates, increased weaning weights, growth, carcass characteristics, etc. — their nutritional requirements also increase.

Thus, to determine the mineral needs of your cattle, livestock specialists advise testing forage and water samples, blood samples, or both. Such analyses allow producers to provide minerals cost-effectively and to the best benefit of the cow-calf pair.

When conducting such an analysis, pay close attention to the major minerals (calcium, phosphorus and magnesium) and the trace minerals (copper, zinc, sulfur, manganese, iron and selenium). Factors to consider include:

- 1) Pay special attention to selenium. Across the United States, Maas reports that selenium deficiency is the most common trace mineral deficiency among cattle.
- 2) Evaluate phosphorus.

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Cattle like open spaces

When it comes to mineral feeder design, cattle prefer an open feeder, according to a New Mexico State University (NMSU) study.

Cattle will utilize about 30% more of a complete salt and mineral supplement when it's in a simple, open feeder compared to a covered vane feeder, the study found. The researchers say this is likely because cattle don't like to put their heads into an enclosed area.

A cover also limits the number of cattle that can feed on the mineral supplement at the same time. An open feeder makes the supplement more accessible to several head at once.

But Maas cautions that open mineral feeders are not recommended in areas with high rainfall. "The mineral mixes can be ruined when they are rained on," he says.

Table 1. Mineral requirements and maximum tolerable levels for beef cattle^a

Mineral, Units	Growing & finishing cattle	Gestating & dry cows	Lactating cows	Maximum tolerable level
Chromium, ppm ^b	—	—	—	1,000.00
Cobalt, ppm	0.10	0.10	0.10	10.00
Copper, ppm	10.00	10.00	10.00	100.00
Iodine, ppm	0.50	0.50	0.50	50.00
Iron, ppm	50.00	50.00	50.00	1,000.00
Magnesium, % ^c	0.10	0.12	0.20	0.40
Manganese, ppm	20.00	40.00	40.00	1,000.00
Molybdenum, ppm	—	—	—	5.00
Nickel, ppm	—	—	—	50.00
Potassium, %	0.60	0.60	0.70	3.00
Selenium, ppm	0.10	0.10	0.10	2.00
Sodium, %	0.06-0.08	0.06-0.08	0.10	—
Sulfur, %	0.15	0.15	0.15	0.40
Zinc, ppm	30.00	30.00	30.00	500.00

Adapted from National Research Council. 1996. *Nutrient Requirements of Beef Cattle*, 7th revised edition. Washington, D.C. National Academy Press.

^aNote: concentrations are for total diets.

^bppm = parts per million

^c% of dry matter

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Phosphorus content in forages can vary greatly during the year and is generally lower in dried winter forages. Thus, stockers grazing mature, dried forages will likely require a high-phosphorus mineral. But keep in mind that calcium and phosphorus supplements should be considered simultaneously because of their role in bone metabolism.

The recommended calcium-to-phosphorus ratio for ruminants is usually 2:1. With growing calves, this ratio is especially important. Deviating from it can result in abnormal bone growth and a condition among steers known as waterbelly. This condition can block normal urine excretion and cause death in steers when left untreated.

3) Consider zinc. Feeding trials have reported that including zinc in the diet may improve carcass characteristics. But if you

consider boosting the amount of zinc that is offered, be sure to monitor copper levels, as zinc can tie up the copper available to the animal.

Lastly, recognize that as we become better farmers and soils are continuously cropped and plant yields are increased, trace minerals may become less available or more diluted. If cattle obtain their feed from a single pasture or hay from one specific area, it becomes even more critical to monitor mineral deficiencies. When the site of feed production is deficient in trace minerals, cattle will be deficient as well since they have no alternate source for nutrition.

Mineral management

Once you have your mineral program mapped out, getting the calves to eat the mineral can be another challenge, Maas says. Despite all the benefits minerals

provide, cattle don't typically like the bitter taste of minerals.

"It can be tough to get cattle to eat what they need to eat, especially in an open range or pasture setting," Maas says. He says research has shown it can take up to 120 days to get cattle on a mineral mix.

Therefore it's best to make minerals available to calves early on, especially as the cow's milk production decreases over the summer and calves move to a grass-based diet. Minerals are critical for calves at this time because forage alone doesn't provide all of their nutritional needs. And, as calves get closer to weaning, providing them with a mineral supplement can help boost their immune systems, as well as get them accustomed to being on feed.

Tricks to try to make minerals more palatable include feeding them with salt (which is a mineral cattle will

actually seek out), providing minerals in a molasses or pellet mix when economical, and administering oral mineral boluses when severe copper or selenium deficiencies are evident. Including yeast culture or distillers' grains, a byproduct of the ethanol process, can also improve the palatability of a mineral mix. By improving the taste and smell of the mineral mixture, calves are more likely to eat it and get the nutritional benefits the minerals provide.

Finally, keep in mind that there is no reason to go to extremes in offering a certain mineral unless there are unusual circumstances. Trace minerals are so called because cattle need only small amounts of them. Too much of a certain trace mineral can be an unnecessary feed expense, and in some cases can be toxic to animals.

