Managing Minerals

Boost herd health and animal performance with a well-managed mineral program.

by ***Kindra Gordon***

Ask cattlemen about their mineral programs, and there's a very good chance they'll share a few stories with you as well as emphasize that they've learned minerals are not a place to cut corners — they are worth the investment.

Many producers will agree that free-choice mineral should be offered year-round, with a few special tweaks during the year such as fortifying the mineral mixes during the breeding season or offering a mineral with fly control included during the summer and fall months.

How can you determine an effective mineral supplementation strategy for your own herd? Steve Boyles, an Extension beef specialist with The Ohio State University, and Shane Gadberry, an associate professor at the University of Arkansas, offer the following suggestions.

"Start by visiting with county Extension agents. They often have a good idea of forage types, quality, and soil characteristics in the area," Gadberry explains.

Boyles also suggests visiting with feed companies working in your area. Their representatives can usually provide some ideas and options on what might be working for other producers in the region, he explains.

Both Boyles and Gadberry are also proponents of forage testing. "I recommend some forage analysis throughout the year and over time. This can give you a benchmark for your land/forage," Boyles says. "Since nutrition is a major cost and mineral supplementation is a relatively minor cost in the total nutrition program, it is worth the investment."

As one example of knowledge gained from forage analysis, Boyles cites a project done about a decade ago with forages from several cow-calf operations in Ohio. He reports, "We found the average copper level to be about 2 PPM (parts per million). While the minimum levels of copper required for a cow are 10 PPM, and even higher for higher producing/lactating cows."

As a result of these findings, Boyles says that, over the years, several commercial mineral supplements have increased the copper content offered.

Regarding forage analysis, Gadberry emphasizes that forages need to be tested seasonally and should be representative of what the cattle are grazing to create a general baseline. He notes that most major and minor minerals can be measured inexpensively. However, some nutrients, like selenium, require a separate analysis to detect lower levels, and this testing can add to the cost.

Gadberry also points out that a challenge to interpreting forage test results is that the level tested doesn't necessarily mean it represents the amount utilizable. "Mineral digestion and absorption is affected by other components of the forage, including other minerals and even water," he explains.

In critical situations where a mineral deficiency is suspected, testing animals is an option. With animal testing, blood samples are adequate to evaluate the status of some minerals; however, tissue samples, such as liver tissue biopsy, may be needed to adequately assess copper.

Additionally, Boyles issues a caution in designing your mineral program if distillers' grains are

Mineral terms

- A "complete mineral" should contain the proper balance and ratios of all 14 essential cattle minerals including: calcium, copper, cobalt, iodine, iron, magnesium, manganese, molybdenum, phosphorus, potassium, selenium, sodium, sulphur and zinc.
- Organic, bioavailable mineral sources are an indication of the absorptive ability of the trace minerals. Key trace minerals to look at for bioavailability would be zinc, manganese, copper and cobalt. These minerals aid immunity, reproduction, growth and fiber digestion.
- A weatherized mineral should be water-resistant and should be a large enough particle size to be wind-resistant, as well. Minerals that are water-resistant are less likely to turn into a hard block that cattle are finicky about consuming. HW

fed. He explains that distillers' grains can be quite high in certain minerals and may alter what you need to supplement.

Don't rely on sight

Also with regard to minerals, Gadberry emphasizes that you should not rely on "seeing" a deficiency. He explains, "Deficiencies are often subclinical, meaning that we can't necessarily 'see' the results of a deficiency or response to supplementation without good records of calf weight gain, health following weaning stress, and herd reproduction."

He continues, "In the south, my experience in Arkansas has been that forage testing and animal testing suggest marginal deficiencies in trace minerals, in particular copper, followed by selenium and zinc. Thus, rather than waiting to 'see' a problem, producers should rely on what testing suggests and what research has shown to be effective for improved mineral nutrition."

Looking to the future, Gadberry adds, "I think we still have a lot to learn about mineral supplementation in cow herds — especially in nutrient surplus areas, mineral interactions, and optimal levels for different forms."

Additional advice

Boyles and Gadberry also offer these additional considerations:

- **Explore causes of magnesium deficiency:** If faced with this situation, check magnesium levels but also check other minerals that can affect magnesium absorption, suggests Boyles. He notes that high levels of potassium often exist in many forages — as well as poultry litter used for fertilization — and potassium can interfere with magnesium absorption. Thus, he suggests checking forage levels for potassium in addition to magnesium.
- **Check copper:** As calves become less dependent on the dam for milk, you may see reduced growth. This growth response may be related to endophyte in fescue, but Boyles suggests also checking for a copper deficiency since it can elicit reduced growth in calves as well.
- **Give heifers some special attention:** Boyles advises that heifers being fed grain supplement may need a mineral supplement that looks more like what you are feeding steers and is higher in calcium than the mineral you might traditionally feed to cows. He reemphasizes, "Work with your local Extension service or feed representative to develop a nutrition program suited to your needs.
- **Know/Remember/Consider that more may not be better:** Gadberry warns, "One concern I have today is super mineral programs with cows that are on a good plane of nutrition, being fed a 'breeder mineral' that is higher in trace minerals and a combination of inorganic and organic source, as well as stacking mineral injections on top of the program. Too much isn't always a good thing."
- **Track the details:** Regarding good mineral management, Gadberry advises that you don't overlook the following basics: 1) keep mineral out regularly, 2) don't put out free choice white salt in addition to a complete mineral package that already includes salt, 3) be sure to target adequate levels of trace minerals, 4) monitor mineral consumption rates in the herd throughout the year and 5) track how much is being spent annually for mineral supplementation. **HW**

Three things to look for in your cattle mineral

Not all minerals are created equal, and it may be time to look at your mineral supplementation program.

Whether you buy a mineral off the shelf at a retail store, walk into your local dealer and request his 'standard' mineral, or work closely with your nutritionist to select a mineral supplement for your herd, sorting through the various mineral types can sometimes be a daunting task. It may even be a purchase decision that's so complex you simply cling to the generic or most popular mineral available in your area.

But, the generic or popular option may not be the best choice for your herd's mineral requirements. If you're not feeding a quality supplemental mineral, you may see the consequences of mineral deficiencies later in the form of decreased calf weaning weights, small or weak calves, decreased milk production, reduced or delayed conception, and even poor immunity.

"Not all minerals are created equal, and it's important to recognize the differences in minerals that are out there," says Greg Eckerle, DVM, beef technical consultant with Purina Animal Nutrition. "Even though mineral nutrition is complicated, you can easily evaluate or ask questions about a few different elements of a mineral supplement."

Here are three things to look for in your cattle mineral:

Selecting the right mineral for your herd can be complicated, but there are three key elements that you can look for when it comes time to purchase.

1) Balanced mineral nutrition

A complete mineral should contain the proper balance and ratios of all 14 essential cattle minerals. Those minerals include calcium, copper, cobalt, iodine, iron, magnesium, manganese, molybdenum, phosphorus, potassium, selenium, sodium, sulfur and zinc.

"A proper zinc-to-copper ratio is one of the biggest considerations when choosing a mineral, with a ratio of 3-to-1 being preferable," says Eckerle. Zinc and copper are commonly deficient microminerals in cattle, and the ratio is critical because of how closely zinc and copper absorption are tied.

2) Large particle size ingredients and rain protection

Rain and other elements can quite literally wash a mineral investment down the drain, or can alternately turn your mineral into a brick-type substance which cattle often refuse to eat. But, minerals should also be wind resistant according to Eckerle.

Greg Eckerle, DVM, Purina Animal Nutrition, says that not all minerals are created equal, and it's important to recognize the differences in minerals that are out there.

"A weatherized mineral should not just be water-resistant, it should be wind-resistant as well," says Eckerle. "You don't want the particles to be so small that the wind picks them up and blows them away. A weatherized mineral that includes a larger particle can remedy this problem."

"The biggest drawback of a non-weather resistant mineral is that cattle just aren't going to consume it. Daily mineral needs to be consumed, and if you're not seeing consumption because the mineral has been turned into a hard block or because the particles are being blown away, then your investment is a loss," adds Eckerle.

3) Organic, bioavailable mineral sources

Another important aspect when choosing a mineral is to make sure it has bioavailable mineral sources. The bioavailability of a mineral source alters the absorptive ability of the trace minerals, eliciting their full benefit.

"Mineral sources that are more bioavailable may be a bit more costly, but they can be a good fit for herds with marginal trace mineral status, consistent reproduction issues, overall herd health problems, foot problems or in areas with forage or water issues," says Eckerle.

Some key trace minerals that you might look to for bioavailability would be zinc, manganese, copper and cobalt. These minerals are required for a variety of functions including, but not limited to, immunity, reproduction, growth and fiber digestion.

Minerals are just one piece of a comprehensive cattle nutrition program. A high plane of nutrition during all three trimesters increases the probability of superior health and performance genetics passing to the calf. Sustained® Nutrition assists in keeping the pregnant heifer or cow in optimal condition for the long-term programming of future generations.

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