

# Mineral Match-up

*From immune function to growth and reproduction, minerals are key to cattle health and performance.*

*by Kindra Gordon*

If your cow herd is struggling with poor pregnancy rates, weak newborn calves or lackluster growth in general, a mineral deficiency could be to blame.

“Minerals matter because they support many of an animal’s biological pathways,” notes Stephanie Hansen, an Iowa State University beef feedlot nutrition specialist.

Although the percentage of minerals in the diet is small — usually 1% to trace parts per million (ppm), she explains, minerals influence health for immune function, bone and muscle growth, feed efficiency and how the animal is able to utilize energy, as well as carcass quality and reproductive performance.

## Minerals 101

Common macrominerals include calcium (Ca), magnesium (Mg), phosphorus (P), and sodium (Na). Macrominerals must be provided in a constant supply through the animal’s diet, from feedstuffs or supplements, because animals cannot easily access stores of macrominerals in their body.

Microminerals, often referred to as trace minerals, include copper (Cu) and zinc (Zn). While some trace minerals can be stored in the animal’s body, cattle can still be deficient in these minerals, which affects animal performance.

Hansen notes that while forages

and feedstuffs supply minerals, the mineral content varies greatly based on geographic location, plant species, soil fertility, stage of plant maturity and even climatic conditions.

Although “book averages” for the mineral content of most feedstuffs exist, Hansen encourages producers to test their own forages to develop supplementation programs.

Hansen says a rule of thumb in mineral management is to assume that only about half of the mineral in forage is available to the animal.

Thus, she suggests balancing deficits with some supplementation and working with a nutritionist or extension specialist to develop an effective supplementation program.

As an example of addressing a deficiency, she points out, “In general, forages often are sufficient in calcium, but phosphorus can be variable.”

To correct this, supplementation may require including calcium and phosphorus together at a 1:1 ratio. Hansen says the reason for supplementing both minerals is because the animal’s body metabolism of one mineral also affects the other.

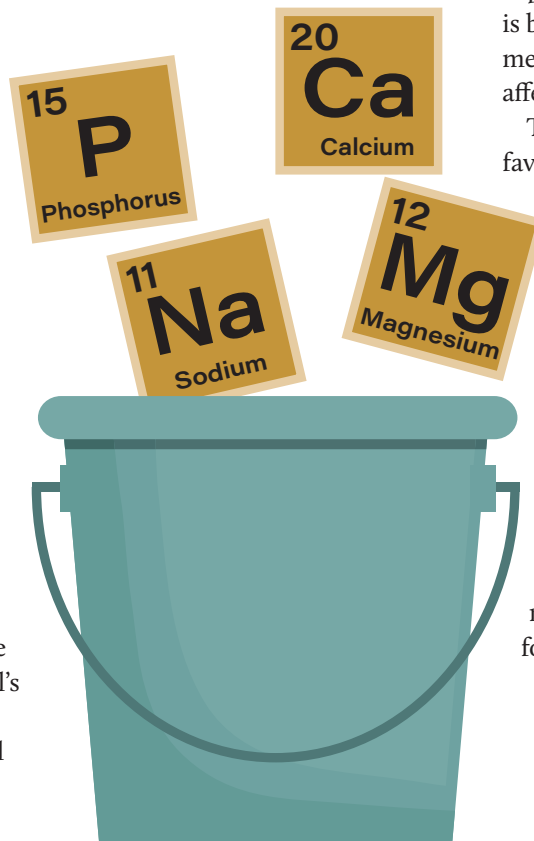
To this, Hansen notes that her favorite saying with regard to minerals is that “no mineral is an island.”

She explains, “You can’t try to fix just one problem. You need to take a holistic approach, because one mineral can affect another.”

## Red flags to watch for

To help producers assess if their cattle may be experiencing a mineral deficiency, Hansen has noted a few “red flags” to watch for. These include:

- *Are sudden poor pregnancy rates an issue that can’t be attributed to poor breeding soundness of the bull?* Mineral deficiencies to look at may include copper,



- manganese (Mn) or zinc.
- **Is the cow herd having issues with retained placentas?** If so, determine if there may be a selenium (Se) or vitamin E deficiency.
  - **Are newborn calves weak or sluggish?** Consider supplementing cows with selenium, vitamin A or E, or iodine (I) prior to calving. Hansen notes that iodine helps with temperature regulation. As an additional tip, she notes that if using an injectable mineral with the cow herd, the ideal timing is 6-8 weeks prior to calving to help boost the mineral nutrition for the newborn calf, as well.
  - **Have you noticed discoloration of cattle's hair, especially around the muzzle, eyes and ears?** A copper deficiency may be the culprit.
  - **Is cattle growth in general poor?** A mineral deficiency could be to blame. Hansen says, "If you know you live in an area where soils are deficient [in minerals], then it is likely the forages/ feedstuffs are deficient."

She concludes: "Test your feeds, test your water, and start a conversation with your nutritionist or extension specialist to see how being strategic with mineral supplementation can help optimize your cattle performance."

*Editor's note: Iowa State's Stephanie Hansen shared remarks during a four-part webinar series on mineral nutrition hosted by the National Cattlemen's Beef Association (NCBA). View the archived webinars at <https://www.ncba.org/cattlemenswebinarseries.aspx>. Kindra Gordon is a freelance writer and cattlewoman from Whitewood, S.D.*



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## More Mineral Considerations

Iowa State University's Stephanie Hansen also shares these mineral considerations:

- Rarely is there a need to supplement iron (Fe), because it is abundant in forages and harvested feedstuffs — often at levels two to three times higher than nutritional requirements. However, high iron levels may act as an antagonist against critical trace minerals like copper and manganese, preventing them from being absorbed and utilized at levels to maintain proper cattle health and nutrition.
- It is a misnomer grass tetany occurs in the spring as a result of grass being low in magnesium. Instead, the magnesium deficiency that causes grass tetany is the result of interference of other minerals in the grass, creating a decrease in absorption of magnesium at needed levels. Potassium (K), which tends to be represented at high levels in forages in the spring, is usually the culprit preventing the animal from obtaining the required magnesium levels. Nitrogen used to fertilize forages is also capable of creating interference with absorption levels of magnesium. Hansen points out that, overall, grass tetany is associated with rapid grass growth, and although issues typically occur in the spring with cool-season grasses, challenges can also occur in the fall with rapid regrowth or with cover crops. To prevent deficiencies causing grass tetany in spring and fall, producers can supplement the beef animal's diet with a mineral high in magnesium.
- Water may also play the role of an antagonist affecting how much of the mineral the animal can absorb and use. Thus, it is important to test water to see if it could be affecting mineral bioavailability.
- Cattle do not have the capability to balance their own diet — often called nutritional wisdom. Hansen says, "Research has found that cattle will select a palatable but poor-quality diet in preference to an unpalatable, nutritious diet." She likens this to humans choosing to eat pretzels instead of a bowl of broccoli. Thus, salt is often included in most free-choice minerals to add palatability to products and keep consumption levels up.