



Minerals must be provided to the animal in a balance. When minerals are not balanced, problems can arise like toxicity and deficiency.

Minding Your Minerals

Mineral nutrition is a balancing act.

by **Travis Meteer**, University of Illinois extension educator, commercial agriculture

Have you ever watched a person walk a tight rope? The balance and precision that it takes to make it from one side to the other is incredible. Focus and attention must be combined with talent and practice. If any small thing goes wrong – balance can be lost and the goal of making it across is gone.

Mineral nutrition is a balancing act too. It is very delicate and much more fragile than other nutrition tasks, such as meeting protein and energy requirements. Minerals must be provided to the animal in a balance. When minerals are not balanced, problems can arise. Low levels can lead to deficiency. High levels can lead to toxicity. Matter of fact, high levels of one mineral can cause a deficiency in another.

Sources of minerals in the diet

Minerals enter the animal primarily through feed, water, and supplementation. While it is easy to understand that your mineral feeder full of mineral supplement is a source of mineral, many times cattlemen ignore the minerals that are available to an animal in the feed and water.

In order to better understand what minerals your cattle are ingesting you should test your feedstuffs and even your water source. If you are certain mineral imbalances are affecting your herd, you can discuss this with your local veterinarian and they can draw blood or take liver biopsy samples to identify mineral deficiencies.

Mineral interactions

I personally believe this is a problem in many cattle rations and many times is holding cow performance back. Producers that are trying to push performance higher need to take a look at what may be causing mineral interactions in their cattle diets.

Mineral interactions can result in one mineral restricting the bioavailability of another. Thus, reducing the amount of that mineral absorbed by the animal. This can lead to deficiency. Another way to put this is an excess can cause a deficiency.

One of the most common mineral interactions in beef cattle is the interaction between calcium and phosphorus. Generally, calcium and phosphorus levels are recommended in a ratio (Ca:P). Ideally, a ratio of 2:1 is targeted. Cattle can handle slightly lower Ca:P ratios, however when the ratio becomes inverted, or

more phosphorus is provided than calcium, steer cattle can be at risk of urinary calculi (also known as water belly). A prolonged period with a Ca:P imbalance in young cattle can interfere with bone growth and decrease overall performance.

Certainly the Ca:P ratio is important to monitor. Many corn byproduct feeds are high in P. In cases of high levels of Ca and P in the diet, other mineral requirements for magnesium, manganese, iodine, sulfur, iron, and zinc will all increase. Remember the key to proper mineral nutrition — balance.

The relationship between copper, iron, molybdenum, sulfur, and zinc is another crucial mineral interaction. These minerals can all influence the bioavailability of each other. High levels of zinc, iron, molybdenum, or sulfur can all interfere with copper availability. Copper deficiency is one of the most common mineral problems across the country.

Do you have hard water? Are your cornstalk bales dirty? Did your hay field get flooded before you cut and baled it? These are all likely suspects for more iron in your cattle rations. Iron is really good at reducing the availability of crucial trace minerals.

Are you feeding distillers grains or CCDS? These feedstuffs are higher in sulfur. High sulfur levels in the ration will bind trace

minerals, especially copper. Cows that suddenly have red tinged hair coats are likely experiencing copper deficiency.

Selenium deficiency is a problem in Illinois. Selenium and Vitamin E are generally used in conjunction to supplement against Se deficiency. This is because both Se and Vit. E work along the same lines in the body to prevent hydroperoxides. Administering Se and Vit. E together is a good supplementation strategy to combat Se deficiency.

Solutions

Producers can utilize minerals that incorporate organic forms or chelates to help resolve major issues with mineral interactions. Injectable minerals are also a potential solution. However, the key is to know what is deficient and how that deficiency is occurring. Your vet will be able to test for deficiencies. Getting rid of an excess will be much more economical than purchasing expensive minerals.

When formulating your mineral nutrition program it is crucial that you are aware of these mineral interactions. Understand that feeds and water can be playing a major role in mineral nutrition of your cattle. Excess can cause deficiency. Consult your nutritionist or Extension specialist for more information on mineral nutrition. **HW**



Producers trying to push performance should look at what may be causing mineral interactions in their cattle diets.



Hard water may increase iron in cattle diets which reduces the availability of crucial trace minerals.

Three things to look for in cattle mineral

by **Greg Eckerle**, Ph.D., beef technical consultant, Purina Animal Nutrition

Whether you buy a cattle mineral off the shelf at a retail store, walk into your local dealer and request their '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 cattle 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 cattle minerals are created equal, and it's important to recognize the differences in minerals that are out there. 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:

1) Balanced cattle 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, sulphur 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. 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.

A weatherized mineral should not just be water-resistant, it should be wind-resistant as well. 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.

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.

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. **HW**