Mineral Supplementation

The importance of minerals in cattle diets

BUILDING A FOUNDATION

Forage is the foundation for grazing beef cattle diets. Unfortunately, the perfect forage simply doesn't exist even given ideal growing conditions. Depending on season and species, forage may provide sufficient energy and protein to meet brood cattle nutrient needs, yet that's not enough for even the healthiest of animals to attain the best performance genetically possible. What's lacking? Vitamins and minerals, plain and simple. This writing will focus on mineral status.

MINERALS?

Yes, minerals. And, that's more than just salt. Macro minerals include calcium, phosphorus, magnesium, potassium, sodium and chlorine (salt), and sulfur. Macro minerals are needed in greater quantities and are generally expressed in units of percentage on feed tags. Trace minerals (sometimes called micro minerals) include iron, selenium, iodine, cobalt, molybdenum, copper, zinc and manganese. While all of these trace minerals play a critical role, the dominant trace minerals of consideration to supplement grazing cattle are copper, zinc, manganese and cobalt. Trace minerals are supplemented in smaller quantities than macro minerals and are generally expressed in ppm (parts per million) on a feed tag. Overall, body mineral status influences growth, reproduction, milk production and health. These amazing elements are crucial for a myriad of body processes (see Amazing Mineral Functions). The importance of mineral nutrition cannot be overstated...without adequate mineral nutrition, production and health are compromised. The degree to which production and health are impacted will be dictated by forage mineral content/bioavailability and mineral needs based on production stage. Stress, whether it is from calving, weaning, shipping, immunological challenges or environment, places a greater demand on the body for minerals, particularly trace minerals.

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AMAZING MINERAL FUNCTIONS

Minerals, they're not just for skeletal and bone formation. Here's a list of vital functions that involve minerals.

- Enzymatic activation, function and component
- Metabolic functions
- Amino acid formation
- Nerve impulse and transmission
- Muscle building and contraction
- Energy metabolism
- Hormone function
- Formation of B vitamins
- Tissue integrity (hoof and skin)
- Milk secretion
- Osmotic pressure regulation
- Acid-base balance
- Rumen microbial growth and metabolism
- Heart regulation
- Blood clotting
- Membrane permeability
- Oxygen and carbon dioxide transport in blood
- Respiratory gas exchange
- Glucose breakdown
- Genetic code transmission
- Protection against oxidative damage to tissues
- Skeletal structure

More often than not, mineral deficiencies go undetected because they typically are manifested in sub-clinical forms in terms of lower forage intake, slower gains, poorer feed efficiency, lower reproductive efficiency and lower immunity. One must also consider the fact that minerals interact with each other, often not in a friendly manner. Too much of a good thing (specific mineral), just might actually create a deficiency by tying up another mineral, making it unavailable. Consequently, it's not only the amounts, but the ratios of various minerals that must be taken into account when formulating mineral supplements.

The rumen environment also impacts mineral availability. While there are rumen microbial mineral needs, these needs are small in comparison to the amounts needed by the body. One exception is the need for cobalt by rumen microbes for synthesis of vitamin B12 (more about that later). Rumen-soluble minerals interact with other components during rumen fermentation, resulting in forms of minerals that are less available for absorption from the small intestine into the blood stream for distribution throughout the body. How well a chosen mineral supplement can fill the gap between what the forage supplies and what the animal needs will be the deciding factor impacting production and possibly health.

ARE ALL SOURCES OF MINERALS EQUAL?

In a word, no. Mineral sources vary greatly in terms of bioavailability and concentration. Sulfate, oxide and carbonate-based trace mineral sources have been the industry standard for years. Oxide forms tend to be the least bioavailable with the degree of availability varying by mineral source. Magnesium oxide can be fairly available, but availability varies tremendously, and, to add insult to injury, magnesium oxide is not palatable to cattle, creating the need to "mask" its taste. Minerals are also capable of antagonisms based on their chemical composition. These antagonisms reduce bioavailability and can take place not only within the animal but within the bag as well. Organic (chelates, complexes, proteinates and polysaccharides) minerals offer higher bioavailability; however, the cost is substantially more. Due to cost, the use of organic minerals, namely trace minerals zinc, copper, manganese and cobalt, are limited to periods where the animal is subjected to more stress, such as calving or weaning, and often a combination of inorganic and organic trace minerals are used in the mineral supplement. There is little debate regarding the superiority of organic, chelated trace minerals (specifically copper and zinc). Research has even shown that organic-complexed trace minerals are an effective component of generational nutrition, even benefitting the animal the minerals are not directly fed to. The ultimate biologically available form of supplementation (100% of copper, zinc and manganese from organic-complexed source) has historically been considered unattainable due solely to the cost of these mineral sources. That has recently changed because ADM is able to control the supply chain from production to delivery of the organic-complexed copper, zinc and manganese. Because of this integration, a mineral supplement with 100% organic-complexed copper, zinc and manganese is now available with no additional cost compared to mineral supplements previously formulated with hydroxy forms of these trace minerals.

THE PAYBACK

Mineral supplementation pays. Return on investment can be evaluated in terms of better gains and reproductive efficiency, the ability to digest forages more thoroughly and efficiently, better immune response and more productive subsequent generations. In stocker cattle an increase of 0.1 lb ADG due to mineral supplementation will overcome a $6.00 per bag price difference and still provide a 3:1 ROI. And, better reproductive response in terms of conception rates also yields dividends. Don't forget about better body condition score due to extracting more energy from available forages. Cows in better body condition have better reproductive efficiency and feed cost may be reduced as less energy supplementation is required.

The production returns for adequate and effective mineral supplementation far outweigh the cost. While cost will always be an important factor dictating mineral supplement selection, the "cheapest" product doesn't mean it will provide the greatest economical return. Producers need to consider the following factors:

- Mineral sources used in the product
- Research, formulation and manufacturing expertise backing the product

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- Consistency of product
- Palatability
- Consumption rate and reliability of consumption
- Weatherization
- Results

You really do get what you pay for. Can you afford to give your herd less than what they need? Mineral know-how is not new to ADM, with roots in mineral manufacturing (MoorMan's®) dating back to the late 1800s. ADM Mineral formulation and manufacturing is based on the expertise that can only be attained from a hundred plus year history of making minerals that cattle producers have relied on for decades.

WHICH PRODUCT IS THE RIGHT PRODUCT?

Mineral supplements are like puzzle pieces, they may look very similar, but each one has a place it fits best. Each forage and supplemental feeding program will set up specific gaps that mineral supplements are designed to close. Every customer gets to determine their own value proposition, based on sourcing and additives available. To fulfill all possible criteria ADM has three key mineral lines that provide organic-complexed trace minerals. Find the puzzle piece that best completes your operation.

For optimum cattle health, as well as performance, affordability and convenience, you can count on ADM's wide pantry of mineral nutrition solutions.

DIAL IN THE RIGHT SOLUTION FOR YOU

AMPT performance minerals are targeted mineral supplements that provide only the minerals and vitamins in the optimum amounts and ratios that benefit cattle, and features 100% chelated copper, zinc, and manganese.

- 4 oz weatherized mineral
- Rumen bypass - 100% chelated Copper, Manganese, Zinc
- Rumen soluble Cobalt
- Highly palatable Magensium
- No added Potassium
- Most consistent intake

MoorMan's Mineral line offers 2 oz per head daily intakes of weatherized range mineral that enable cattle to take full advantage of available forage and enhances the rumen microbes' ability to digest roughage.

- 2 oz weatherized mineral
- Rumen bypass - Copper
- Rumen soluble Cobalt
- Targeted intake
- Best cost per head per day

Provides value that goes beyond the bag, into the feeder and onto your bottom line. Choose your mineral formulation from an extensive line-up of options.

- 4 oz weather resistant mineral
- Rumen bypass - Copper
- Highly diversified offering
- Traditional mineral program

ADM Seasonal Minerals

ADM Seasonal beef mineral products help you provide essential minerals and vitamins to your herd in an affordable, convenient and easy way.

- 4 oz mineral
- Highly palatable
- Straight-forward program

GET RESULTS...

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