Vitamins And Minerals Are Key For Optimum Livestock Performance

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The conversations between producers and nutritionists regarding livestock mineral intake generally focus on two areas: 1) What mineral blend will most efficiently balance the dietary and performance needs of the animals and 2) How that mineral will be fed. When it comes to mineral delivery, special attention should be paid to how the mineral is physically consumed by the animal and, just as importantly, how the individual mineral components are utilized inside the body, i.e., the bioavailability of the mineral ingredients.

All too often we find that a mineral program is put in place and left alone until a problem arises. Don't wait for a reason to evaluate your mineral program; ask yourself these questions now to avoid a problem later:

Is there enough mineral in the diet?

Investigating whether or not there is enough mineral in the diet requires a thorough examination of the ration and what is actually fed. Once the ration is properly balanced, mineral delivery needs to be evaluated.

There are several methods used to incorporate mineral into a diet, all of which can pose challenges to proper mineral delivery. For example, many livestock producers feed their mineral in a TMR. To ensure that this method of mineral feeding truly distributes the mineral uniformly, a TMR audit should be done at least twice a year. An audit could reveal improper mixing techniques or inaccurate scale readings, which in turn, would reveal inaccurate mineral delivery.

Is the mineral delivery strategy appropriate?

While there is a mineral delivery strategy to fit the need of most operations, some methods are simply inefficient and are considered poor mineral delivery methods.

Examples of weak mineral feeding methods are:

Mineral Blocks: Blocks are typically not capable of providing enough macro-mineral volume to meet an animal's daily mineral requirement. Similarly with salt blocks, animals cannot physically lick off enough volume in a day to provide a sufficient amount.

Mineral Water: Some producers believe that supplementing their water source with mineral will meet their animal's mineral requirements. This, however, is not the case. Water systems cannot deliver adequate levels of macro-minerals or trace minerals.

"Cafeteria-Style" Free Choice: This strategy involves offering free choice minerals as individual mineral components, driven by the belief that the livestock are able to select which specific minerals, and how much, they need in their diet. Truth be told, several of these manufacturers admit that in order to avoid toxicities or deficient intakes, each individual mineral is flavored to drive the desired intake. This completely counters the original marketing claim that consumption will be driven solely by the animal's perceived need.

Can the mineral be utilized?

The answer to this question can be influenced by many factors ranging from feed delivery, digestion and/or utilization of the mineral.

Is the source of mineral appropriate?

As with the mineral feeding strategies, there is a wide array of options presented to the livestock industry as acceptable "mineral" sources. That being said, a number of these options are inefficient and can be a waste of money compared to a high quality mineral source that is readily bioavailable to the animal.

Kelp: The mineral quality and quantity of kelp compares closely to that of typical alfalfa, with the exception of kelp's high iodine content. Kelp contains a wide range of minerals and several vitamins that are high in bioavailability, but low in quantity; therefore, kelp does not qualify as a fortified mineral supplement as it does not meet an animal's daily nutrient requirements.

Clay: Various clays can contain a wide array of minerals. Because clay has a strong molecular structure, much of that mineral is not available to the animal and what is has a low bioavailability. Clay can also be damaging to the utilization of many other nutrients as it often binds them up. This is counterproductive to mineral delivery.

Charcoal: Typically used as a weak, non-polarized, mycotoxin binder, charcoal has the blind affinity to also bind macro-minerals, trace minerals and vitamins in the diet; which decreases their ability to be utilized by the animal.

Diatomaceous Earth (DE): DE is a silica clay that is mistakenly thought to be a natural dewormer. ATTRA (Appropriate Technology Transfer for Rural Areas) has done several studies and is unable to substantiate the efficacy of DE as a dewormer[1]. This abrasive powder acts in a non-specific manner and can pose a respiratory hazard to livestock, as well as human health. DE can also significantly tie up nutrients and compromise the diet.

Humates: In the United States, it is illegal to feed humates to livestock. Humates are a high carbon derivative of charcoal, offer poor bioavailability, tie up dietary nutrients and contain several undesirable heavy metal compounds.

Is the mineral bioavailable?

Bioavailability is one of the most important factors to consider when choosing a mineral. The efforts put into ensuring proper delivery of the mineral is seriously compromised if the mineral is not able to be utilized correctly by the livestock. Minerals formulated with sulfate and/or oxide forms of trace minerals have a reduced bioavailability due to their high levels of reactivity with other nutrients[2]. Also be aware that minerals appearing red in color may contain high levels of iron oxide (ferrous oxide), often added for visual appeal. Iron oxide, however, is another highly reactive compound that can greatly reduce the bioavailability of a wide range of minerals and vitamins.

Crystal Creek® minerals are formulated for high bioavailability to ensure that livestock truly utilize as much mineral as possible and offer the best return on producer feed dollars. This, in part, can be attributed to the proteinate and polysaccharide mineral carriers Crystal Creek® utilizes that are more biologically accepted as compared to sulfates and oxides.

Is a complete, balanced, free choice mineral available?

Nutritionists will often not recommend putting out a free choice mineral because they feel the mineral is already included in the force fed ration. This approach is a bit arrogant and relies entirely on the idea that the nutritionist has complete control over what the livestock are fed and what they are truly consuming. Nutritionists who understand that complete control over all variables is impossible, will recommend offering a complete balanced (containing no salt and no flavoring) free choice mineral at all times.

Offering a balanced, free choice mineral will give the livestock an opportunity to indicate when they are not receiving adequate mineral from their feed, for whatever reason. For example, a drastic increase in free choice mineral intake could signify a problem such as poor TMR mixing or an exposure to mycotoxins. The alternative to not having free choice mineral available might result in a longer period of time before the problem is identified, all the while the livestock are insufficient on mineral intake. The small investment of feeding a free choice mineral more than pays for itself in prevention of lost revenue.

Mineral feeding provides the most basic level of nutrition necessary for an animal's functional and productive life, and therefore, should not be taken lightly. Dietary minerals touch all aspects of livestock health and can help improve a livestock operation's bottom line. Take the time to address your mineral feeding strategy as well as potential areas of improvement. To learn more about evaluating your livestock mineral program, contact a Crystal Creek® nutritionist.

Sources:

[1] ATTRA Sustainable Agriculture "Tipsheet: Organic Management of Internal and External Livestock Parasites", July 2015

[2] Feed Management, December 1996