

MINERALS 101

By Dr. Jimmy Horner

As I have the pleasure of visiting various Wagyu operations throughout the U.S. and around the globe as part of my business, I'm always curious about an operation's mineral program and their approach to managing the mineral nutrition of the herd. The majority of producers understand that minerals are indeed required nutrients and are not optional, and most operations provide supplements during winter and spring, yet it is not unusual to run across a few individuals each summer that do not deem it important to provide mineral supplementation once pastures are green and growing. Though cattle will frequently consume less free-choice mineral while grazing lush, green pasture the truth is just because the pasture is green does not mean it suddenly meets all of the animal's requirements. It doesn't. Though this management practice can certainly cut production costs in the short run, it can prove very costly in the long run.

Minerals and vitamins occupy a very small and yet vitally important role in the proper nutrition of cattle. Minerals and vitamins play critical roles in reproduction, immunity, growth and overall health of the animal. Minerals are classified as either macro-minerals or micro-minerals (trace minerals).

Macro-minerals include calcium, phosphorus, magnesium, potassium, sulfur, and salt which are present in relatively large concentrations in the body and required in larger amounts in the diet. Micro-minerals include copper, zinc, manganese, selenium,

cobalt, manganese and iodine which are present in low levels in the body and required in smaller or trace amounts in the diet. Each of these minerals has a specific physiological function(s) and their deficiencies can have grave consequences.

Vitamins A, D and E are often required in supplements as well with some B vitamins growing in popularity especially for stressed cattle and cattle with undeveloped or improper rumen function.

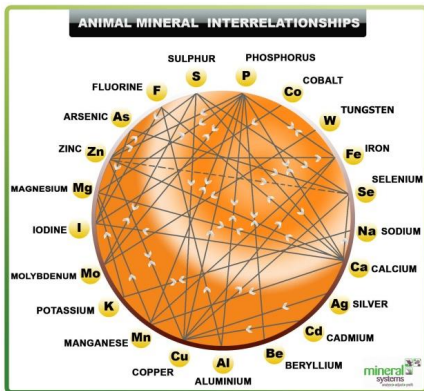
A producer should take several

factors into consideration when selecting a specific mineral supplement for their individual operation. These include:

- Forage quality-regular testing of each hay shipment or cutting, pasture clippings
 - Water quality-test well water annually and surface water bi-annually
 - Age and class of cattle-open vs. bred, nursing vs. dry, young vs. mature
 - Known deficiencies or antagonists in soil or water
 - Herd history and any known breed x mineral predispositions
 - Expected consumption level and cost
- Producers should try to select



mineral supplements that meet requirements yet avoid excesses that not only reduce profits but may also lead to imbalances with other minerals. Most mineral ingredients interact with each other so a continuous, proper balance is critical (see Figure 1). In other words, a high level of one mineral can have a negative impact on the utilization of another mineral such as that of elevated potassium in lush wheat pasture leading to potential magnesium deficiency and grass tetany.



The best mineral supplement in the world is of no use if the cattle fail to consume it consistently.

Thought there are several different forms of mineral supplements including loose, blocks, tubs, etc., the best form is the one that your cattle eat with the most consistency and that contributes to your individual operation attaining its goals and objectives for reproduction, growth, herd health and efficiency year after year. I recommend covered mineral feeders if loose mineral is used and loose minerals should have minimal small particles to avoid caking and losses to wind. Factors affecting mineral consumption include:

- Proximity to water source and gathering area-mineral feeder per 30-40 cows placed near water, near shaded loafing areas or near best grazing area
- Freshness-loose minerals may need to be changed out weekly to ensure consistent intake
- Salt content of supplement-cattle eat to taste just like us

- Palatability of carrier or filler in supplement-ingredient for carrier should be high quality, consistent and highly palatable
- Lush vs. sparse pasture-good pasture = less consumption, poor pasture = more consumption
- Weather-drastic changes in weather may temporarily increase mineral consumption



The bioavailability of the mineral source is important and not all mineral ingredients are created equal. Though chelated and/or organic trace minerals are certainly not required in every mineral supplement, they can be highly beneficial especially in breeding herds with fullblood Wagyu females and sulfate forms of trace minerals are much preferred over cheaper oxide forms as well. After working with the Wagyu breed for over 22 years now and sharing personal experiences with other nutritionists, veterinarians and embryologists involved with the breed for many years, several of my colleagues and I have become somewhat convinced that Wagyu may indeed possess an inherent inefficiency in metabolizing certain trace minerals and vitamins. As a result, I typically either formulate supplements which contain more biologically available forms of these particular nutrients or I will increase minimum allowances by 10-15% and I often incorporate both approaches. Copper, zinc and vitamin E seem to be the most trou-

blesome in my own experience and as a result, I often utilize the sulfate and/or chelated forms of copper and zinc, and natural source vitamin E. There are confirmed breed x nutrient interactions with other cattle breeds and maybe someday our concerns with Wagyu regarding this area of mineral nutrition will either be confirmed or dispelled.

The bottom line is minerals are required nutrients and should not be considered optional. A proper balance of essential minerals is critical. Forage and water supplies should be tested regularly to help determine the specific mineral profile needed. Mineral supplements should be placed near watering sources and cattle gathering areas, and kept fresh. Sources of mineral supplements may vary widely in bioavailability and if raising Wagyu cattle, particular attention should be paid to sources of ingredients. A good mineral program for a typical Wagyu cow should cost no more than \$20-30 per year and serves as a rather inexpensive insurance policy once you factor in the costs of lost profits and reduced productivity associated with inadequate mineral nutrition. Please feel free to contact me at jhorner@protocoltech.net with any questions regarding this article or if you would simply like to discuss this subject further. 🌱

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