
Mineral Product Definitions for Beef Operations

Mineral supplementation can be an overwhelming and daunting topic for many beef producers. There are lots of terms, definitions, and abbreviations used when describing the ingredients and formulation of mineral supplements. This information sheet provides some basic definitions and background on the types of products that are on the market to help differentiate them from one another. More detailed information on selecting a mineral supplement for your operation can be found at [ANR- 2209 Considerations for Mineral Supplementation in Cow-Calf Operations](#).

Trace Mineralized Salt – Trace mineralized salt generally contains sodium chloride (white salt), and is fortified with microminerals such as copper, zinc, manganese, and selenium. These mineral products are generally cheaper than other commercial blends, but do not offer a complete mineral package for cattle. Typically these formulations contain high salt content, and relatively low levels of trace minerals. Providing trace mineralized salt along with a complete free-choice mineral supplement will generally reduce the intake of the complete free-choice mineral supplement.

Complete Free-Choice Minerals – A complete free-choice mineral contains salt (generally 15 to 25% of the formulation), and both macro- and micro-minerals that are required to supplement the forage based diet. Macrominerals include calcium, phosphorus and magnesium, sodium and chloride. Microminerals generally include copper, zinc, manganese, cobalt, iron and selenium. The complete free-choice minerals are generally formulated to be consumed between 2 to 4 ounces of product per head per day. Additional additives such as vitamins, ionophores, or fly control products (see ‘Minerals with Added Technologies’ below) can also be included in the formulation.

Chelated Minerals – Chelated minerals, or organic minerals, are characterized as mineral salts (usually trace minerals) that have a mineral-carbon bond (the carbon being a carbohydrate, protein or amino acid). These mineral products generally have greater bioavailability than most inorganic minerals, enhancing their absorption and use by the animal. Chelated minerals are generally included as a portion of the total components in a mineral mixture. Historically, products were more strictly non-chelated or chelated in nature. However, as product formulation has progressed, more commercially available products use a combination of non-chelated and chelated minerals to improve quality while maintaining a moderate level price point.

Hydroxy Trace Minerals – Copper, zinc, and manganese are sometimes formulated using a hydroxyl group binding technology. This provides a strong covalently bonded mineral complex that allows them to be better protected from alteration in the rumen, but instead passed to the lower gastrointestinal tract for absorption in the small intestine. This technology is designed to create greater bioavailability and absorption of these trace minerals by the animal.

Oxide Compounds – The form of mineral product in each formulation is important, as evidenced by the idea behind the above products. When selecting a free-choice mineral, choose those supplying zinc, copper, and manganese in the form of sulfate and not oxide. These forms are generally more available to the animal and used more effectively. Note that the most often used form of magnesium in mineral supplements is magnesium oxide.

Injectable Minerals – Injectable mineral products are designed to deliver trace minerals such as copper, zinc and selenium to beef cattle. These products may be used to rapidly elevate the trace mineral status of an animal. Injectable products should not be used as a replacement for a mineral feed supplement, but may be used in combination with a consistent program to improve trace mineral status during key times in the production cycle.

Minerals with Added Technologies

- Ionophores – Products such as Rumensin or Bovatec are often added to mineral supplements to improve feed efficiency. Blending these products with minerals helps ensure more consistent consumption, and can have positive effects on feed efficiency on grazed forage systems or in drylot settings.
- Fly Control – Many mineral packages may include the addition of insect growth regulators (IGR) or larvicides as fly control. These products work by providing control through manure. Product efficacy is based on cattle consuming the mineral product consistently containing these products, and starting cattle on these products prior to fly issues reaching threshold levels of concern.
- Combination - Both of these products may be present in some mineral formulations. Additional feed antimicrobials or antibiotics will require a Veterinary Feed Directive.

Additional Resources:

[Timely Information – Veterinary Feed Directive Requirements for Feed Distributors](#)

[ANR-2210 Mineral Requirements for Beef Cattle in Alabama](#)

[ANR-2209 Considerations for Mineral Supplementation in Cow-Calf Operations](#)

[ANR-2322 Mineral Supplementation for Newly Received Stocker Cattle](#)

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