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## **Trace Mineral Nutrition of Florida Grazing Cattle**

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### **Essential Trace Minerals**

Approximately 16 different minerals are required to support normal biological functions in beef cattle. Under grazing situations nearly all of these are adequately provided by forage and water. Minerals, which are not met by dietary sources, need to be supplemented. These minerals are grouped into two categories, macrominerals and microminerals. The macrominerals, which are commonly supplemented to grazing animal diets, include sodium (as NaCl), potassium, calcium, phosphorus, magnesium, and sulfur.

Only the microminerals which form a group called the essential trace minerals (ETM's) will be discussed in this report. Seven trace minerals are considered essential to support normal physiological functions in beef cattle. These include cobalt, copper, iodine, iron, manganese, selenium, and zinc. The level at which these ETM's are supplemented varies in accordance with the amount and availability in the diet being consumed. A common misconception is that animals will consume trace minerals, as they are needed. In reality, sodium as sodium chloride (salt) is the only mineral which animals have the innate ability to consume as needed. Therefore, proper trace mineral intake is crucial when addressing potential deficiency situations.

The most common form of trace mineral supplementation is through the consumption of commercial, free-choice loose mineral mix. Typically, these mineral mixes are formulated with an intake expectation of 2 to 4 ounces of mineral per animal per day. Unfortunately, achieving this target intake by all animals does not occur. Several animals within a herd will consume very little to no mineral at all. However, over time and on the average mineral consumption usually meets the desired intake levels. It is this averaging effect, over time, which allows free-choice mineral supplements to be the most practical

choice for most Florida Cattlemen.

### **Is This Enough?**

Although deficiencies due simply to an insufficient mineral intake exist, many minerals, such as copper, zinc, and selenium, may experience impeded absorption due to the influencing factors of other antagonizing elements. One well-known example in Florida is the antagonistic combination of copper and molybdenum rendering copper unavailable for absorption. For molybdenum to exert an influence on copper, it is essential that an adequate level of dietary sulfur be available. When total dietary sulfur levels fall below .25%, even high levels of molybdenum are seldom a problem with copper absorption. The contribution of multiple interfering compounds makes a clear understanding of trace mineral metabolism difficult. Many research groups, ours included, continue to focus effort toward a better understanding of the intricate relationship of trace mineral nutrition in beef cattle production systems.

### **Do I Have a Trace Mineral Deficiency?**

1. Address Other Factors:

The first step in identifying trace mineral deficiencies is to attempt to rule out other more directly contributing factors to decreases in animal performance. For instance, if average cow body condition scores are below 4 ½, chances are far greater that decreases in reproductive performance and/or immune competence are a result of energy/protein deficiency versus trace mineral deficiency. Secondly, be sure that proper management of free-choice trace mineral feeding is offered. For instance, are the cattle being offered a continuous supply of fresh, dry mineral? Are they consuming the mineral at an appropriate level?

2. Forage Trace Mineral Concentrations

Know the trace mineral contribution of the available feedstuff. Collect forage samples being careful to select that forage which the animals are actually grazing or consuming as hay. Perform a standard trace mineral evaluation of the forage. Many commercial laboratories offer trace mineral packages which provide multiple analyses for a minimal price.

3. Herd Trace Mineral Status

Often times it is possible to establish a reasonable plan of action by addressing points 1 and 2. However, in some instances it may be important to further explore a potential trace mineral deficiency by examining animal trace mineral status through blood and liver collection. For two of Florida's most troublesome trace minerals, copper and selenium, liver samples provide the most reliable indicator of actual animal stores. Blood samples are an unreliable approach for the measurement of these elements. Today, the liver tissue collection technique is simple, inferring very little stress to the animal.