

# Trace Minerals and their Importance

Relationships affected by Trace Mineral Nutrition

Reproductive Performance  
Level of Stress

Rate of Gain  
Level of Milk Production

## Trace Minerals involved in Ruminant Health

### COPPER

#### Direct problems associated with a Copper deficiency!

- Cows:**
- 1) **Inhibited conception** (Even though estrus may be normal)
  - 2) **Reproductive Failure** caused by early embryonic death and resorption
  - 3) The possibility of increased numbers of **Retained Placentas**.
  - 4) **Necrosis of the Placenta**. (A placenta that dies)
  - 5) **Decreased ovulation**
  - 6) **Increased dystocia** (Calving problems)
  - 7) **Lower Immunity**
- Calves:**
- 1) **Inability to suckle properly** and Central Nervous System abnormalities
  - 2) **Diarrhea**
  - 3) **Subestrus** (Delayed puberty)
  - 4) Impaired tissue oxidation caused by malfunction of the copper-related enzyme system through-out the animal
- Bulls:**
- 1) **Decreased Libido**
  - 2) **Decreased spermatogenesis**

#### Indirect problems associated with a Copper deficiency!

A Poor Haircoat that may be reddish in color  
Retarded Growth      Reduced Longevity      Skeletal changes

### COBALT

#### Direct problems associated with a Cobalt deficiency!

- Cows:**
- 1) **Depressed Milk and Colostrum yield and quality**
  - 2) **Reduced Fertility**
  - 3) **Lack of Vitamin B12 during lactation** (Cobalt is necessary in the synthesis of Vitamin B12)

**Calves of Cobalt deficient Cows:**

- 1) **Poor Condition at Birth**
- 2) **Increased young calf mortality**

#### Indirect problems associated with a Cobalt deficiency!

Depressed Appetite      Poor Digestion      Wasted Feed  
Poor Growth and Weight Loss

# Manganese

## Direct problems associated with a Manganese deficiency!

- Cows:**
- 1) **Suppression of estrus**
  - 2) **Reduced Conception Rate**
  - 3) **Delayed Ovulation**
  - 4) **An increased incidence of abortion**
  - 5) **The possibility of Delayed opening of vaginal orifice**

### Calves of Manganese Deficient Cows:

- 1) **Light Birth Weights**
- 2) **Infant Calf Mortality**

- Bulls:**
- 1) **Seminal Tube Degeneration**
  - 2) **Inhibited Libido**

## Indirect problems associated with a Manganese deficiency!

**Poor Skeletal Development**  
**Legs and Joints that are weak or in poor condition**

# Zinc

## Direct problems associated with a Zinc deficiency!

- Cows:**
- 1) **Reduced Conception Rates**
  - 2) **An increased incidence of Retained Placentas**
  - 3) **Increased Dystocia** (Calving Problems)
  - 4) **Decreased Immunity**
- Bulls:**
- 1) **Impaired Growth**
  - 2) **Delayed Puberty**
  - 3) **Decreased Testicular Size**
  - 4) **Decreased Libido**
  - 5) **Atrophy of Seminiferous Tubules**
  - 6) **Impaired development and function of reproductive glands**  
and the consequent **inhibition of spermatozoa maturation.**

## Indirect problems associated with a Zinc deficiency!

**Mild to severe Hoof condition problems** which inhibit desired cow and bull performance.  
**Sub-optimal skeletal structure and growth and weight gain**  
**Poor feed utilization and efficiency**  
**Stress related problems**  
**Poor, rough haircoat**