

# **Magnesium (M-Mix)**

## **Bone and Blood Development**

**Magnesium is an enzyme activator primarily involved in energy metabolism and bone formation**

**Magnesium improves calcium and phosphorus metabolism and calcification of bone. Magnesium is needed by the body in relatively small amounts but is very important to life. About 70% of the magnesium in the body is in the bone, combined with calcium and phosphorus. Muscle contains more magnesium than calcium. Magnesium is present in the blood, organs and tissue fluids of the body. A deficiency of magnesium in the blood causes grass tetany in cattle, a highly fatal disease.**

**Magnesium absorption takes place mainly in the small intestine and to a lesser extent through the rumen wall. However, due to the very large surface area of the rumen wall, the rumen makes a substantial contribution to total magnesium absorption. Plasma magnesium may be the major factor controlling absorption. There appears to be poor regulation mechanisms in the body to control magnesium losses. Magnesium is excreted in the urine and feces.**

# **Magnesium (M-Mix) 2**

**Magnesium deficiency results in vasodilation (blood vessels relax and increase in size), extreme irritability with convulsions, loss of equilibrium and trembling and tetany (as seen in cattle in the spring with grass tetany). High calcium and high phosphorus depress magnesium absorption. With high dietary phosphorus, there may be formation of insoluble magnesium-phosphate salts that are excreted in the feces. When these insoluble salts form in the kidneys, urinary calculi results.**

**MAGNESIUM – The optimum amount is in a range of 0.29 – 0.3% of the total dry matter.**

**Magnesium is alkaline.**

**Magnesium toxicity is unlikely under most conditions. Large doses of magnesium have a laxative effect.**



# **Magnesium (M-Mix) 3**

## **EFFECT OF AN EXCESS OF MAGNESIUM**

- **Increases need for phosphorus and other elements.**

## **EFFECT OF A DEFICIENCY OF MAGNESIUM**

- **Irritability**
- **Irregular gait or shifting lameness.**
- **Weak pasterns.**
- **Muscle tremors.**
- **Grass Tetany - animals may be temporarily blinded; may turn in circles until balance is completely lost: frothing at the mouth.**

# **GRASS TETANY**

**Magnesium deficiency-induced grass tetany occurs mainly in the spring (occasionally in the fall) when fast growing pasture grasses are the primary forage for cows. It is also seen more frequently on fertilized pastures (especially when fertilized with commercial N-P-K based fertilizers). High potassium depresses magnesium absorption. The sodium/potassium ratio appears to be more important than the potassium concentration.**

**Magnesium forms a chemical complex with ammonia in the rumen. High ammonia levels are normally seen with the very high soluble protein levels normally found in growing grasses. The ammonia can be used by rumen bacteria to make amino acids/ proteins provided there is adequate carbohydrate (energy) sources available to the bacteria.**

**Fast growing grasses have a very high water content and are relatively low in energy. The tetany seen with magnesium deficiency may be brought on by emotional stress (such as moving cattle, attempting to rope or corral the animal for treatment), and/or by cold temperature stress.**