



GRASS TETANY

“Grass Tetany” is best described as a complex metabolic disorder of ruminant animals resulting from reduced intake, reduced absorption or reduced skeletal mobilization of magnesium. This disorder is also referred to as “Grass Staggers,” “Lactation Tetany,” “Pasture Tetany” and “Wheat Pasture Poisoning.” All adult bovines, including steers and sheep, may develop this metabolic condition. However, this condition is observed to occur most frequently in pregnant or lactating bovines while feeding on lush, rapidly growing cool season pasture grasses. Often these pastures have been heavily fertilized with potassium and/or nitrogen fertilizer. Older, heavier milking cows are more susceptible than those with their first or second calves.

Grass Tetany will occur most commonly about five to ten days after wet, cold weather and the air temperature has increased to around 60°F or greater. Grass Tetany has occurred in cattle grazing orchard grass, perennial rye-grass, timothy, tall fescue, crested wheatgrass and smooth bromegrass. This disorder can also occur in cattle grazing wheat, rye, oats and barley, as well as in those being wintered on low magnesium grass hay or corn stover.

Causes

Grass Tetany or Hypomagnesemia results from a dietary deficiency of magnesium or from the presence of some factor in the diet which reduces the absorption and/or utilization of magnesium. Magnesium plays an essential role in thousands of metabolic reactions in the body, especially those involved with energy utilization. Therefore, cows and ewes are most susceptible to Grass Tetany during late pregnancy or early lactation when dietary energy and magnesium needs are greatest. Tetany-prone forages are either low in magnesium at this time or contain high levels of potassium and nitrogen. Studies have shown that high levels of potassium and/or nitrogen in the forage (resulting from high

rates of nitrogen and potassium fertilization or from a heavy application of broiler house litter) result in impaired magnesium uptake by the plant and/or utilization by the animal.

Forage dry matter that contains less than 0.2 percent magnesium and more than 3 percent potassium and 4 percent nitrogen (25 percent protein) is likely to cause Grass Tetany. Forages high in potassium and nitrogen should contain at least 0.25 percent magnesium on a dry matter basis. Wheat pasture poisoning is thought to be the result of ingesting abnormally large amounts of potassium from the diet, thus causing relative or absolute hypomagnesemia as serum potassium levels rise.

Hypomagnesemic tetany occurring in cattle wintered on pasture and exposed to inclement weather may be related to inadequate caloric intake and possibly the resultant hyperactivity of the thyroid gland. Also cows that are herded and worked at this time may be more susceptible to Grass Tetany.

The worst combination of causative factors and the most common circumstances in which the disease occurs is inadequate energy intake (lush pasture) with a low dietary content of magnesium (grass pasture) in recently calved cows. One other important factor is the variation between individual animals in their susceptibility to hypomagnesemia and to the clinical disease.

Symptoms

The clinical picture most commonly seen is an alert downer animal that upon stimulation attempts an uncoordinated effort to escape or attack the stimulator. This condition is usually followed by a Downer Syndrome accompanied by paddling movements, with subsequent exhaustion and death occurring rapidly. Cows usually exhibit external or visible signs indicating the potential development of the Grass Tetany syndrome. Initially, the cow may have a depressed appetite and exhibit a

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dull, lethargic appearance. However, animals deficient in calcium may be sluggish instead of nervous as when they are suffering from a magnesium deficiency. In wheat pasture poisoning animals may be deficient in both calcium and magnesium. Therefore, animals may have a calcium and magnesium deficiency at the same time, thus masking the signs of a magnesium deficiency.

As the condition progresses, signs of stiffness may be apparent as she walks, and ultimately, a staggering gait may become apparent. The animal becomes highly excitable, nervous and has readily visible muscular tremors as the severity of the condition progresses. In the most severe stage, the animal collapses to the ground with continuation of the tetanic muscular spasms. The legs will usually thrash the ground around the cow. Death occurs after the collapse stage of tetany if the animal does not receive medical treatment. There are no gross lesions evident in animals dying from uncomplicated Grass Tetany. Bruises due to trauma are common in animals dying a violent death. Bloat and pneumonia due to aspirated ingesta may occur in complicated cases.

Treatment

Grass Tetany should be regarded as a serious condition requiring immediate attention and the help of your local veterinarian. Therapy is aimed at increasing the serum magnesium level, as well as supplementing the dietary intake of magnesium. Typically the serum level of magnesium in normal grazing cattle is 18 to 20 parts per million (ppm). Cattle suffering from Grass Tetany are often reported to have serum magnesium levels of less than 10 ppm. If laboratory analysis reveals that blood serum contains less than 10 ppm of mag-

nesium, or if urine contains less than 20 ppm magnesium, the animal is in acute danger of having a convulsive attack of Grass Tetany.

Injecting 200 cubic centimeters (cc) of a 20% magnesium sulfate (Epsom salts) solution under the skin places a high level of magnesium in the blood in 15 minutes. This treatment is then followed with a calcium-magnesium gluconate solution. Intravenous injections should be administered slowly and only by a trained person due to the danger of heart failure if given too rapidly. In emergencies, a rectal enema containing 60 grams $MgCl_2 \cdot 6H_2O$ (Magnesium Chloride Hexahydrate) in 200 cc water can be used.

Prevention

As mentioned earlier in this Timely Topic, several factors are involved in the mechanisms causing Grass Tetany. Continuous daily feeding of a Vigortone high magnesium mineral mix that supplies 10-20 grams of magnesium per head per day should help prevent the occurrence of Grass Tetany. Studies at the University of Kentucky have shown that tetany-prone animals are unable to obtain much magnesium from their body reserves. Therefore, the animal must be well adapted to the free-choice mineral before the tetany season begins to insure an adequate daily intake of magnesium. This regime should begin 30 days before grazing of the lush pasture and be continued until the rapid growth stage of the pastures has changed.

If the increased feeding of magnesium is not started prior to grazing the tetany-prone pasture, the consumption of magnesium needs to be 20 to 40 grams per head per day. In some areas, the Grass Tetany season may stretch from October through May.