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Grass Tetany

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Grass tetany is a nutritional or metabolic disorder characterized by low blood magnesium, yet it is not just a simple magnesium deficiency. It is also called grass staggers, wheat pasture poisoning and hypomagnesemia. It primarily affects older cows nursing calves under 8 weeks of age, but may also occur in young or dry cows and growing calves. It happens most frequently when cattle are grazing lush, immature grass, but occasionally occurs when cattle are fed dry forages (winter tetany).

High potassium and nitrogen content of grass seems to be associated with low blood magnesium. High nitrogen fertilization seems to reduce magnesium availability, especially on soils high in potassium or aluminum. Grass tetany occurs most frequently in the spring, often following a cool period (temperatures between 45 and 60°F) when grass is growing rapidly, but also is seen in the fall with new growth of cool season grass or wheat pastures.

Low blood magnesium may be caused by 1) a diet low in magnesium, 2) a diet with nutrient imbalances that interfere with magnesium metabolism, or 3) higher levels of milk production. When blood magnesium drops too low, proper nerve impulse transmission fails, causing a tetanic disorder.

The following series of signs have been observed in cattle affected by tetany: 1) grazing away from the herd; 2) irritability; 3) muscular twitching in the flank; 4) wide-eyed and staring; 5) muscular incoordination; 6) staggering; 7) collapse; 8) thrashing; 9) head thrown back; 10) coma; and 11) death. Animals on pasture are often found dead without illness having been observed. Generally, evidence of thrashing will be apparent if grass tetany is the cause of death.

The cause of death can be confirmed in a dead animal by collecting a urine sample from the urinary bladder on postmortem examination. The level of magnesium in the urine is very low when grass tetany was the cause of death.

In sheep the disease occurs under essentially the same conditions, and has the same clinical signs as in cattle.

Prevention

The prevention of grass tetany depends largely on avoiding conditions that bring it on:

1. Hold cattle off new grass until it is 4 to 6 inches tall.
2. Feed dry hay or grain until grass can provide adequate nutrition.
3. Maintain cows on a moderate plane of nutrition until ample grass is available.
4. If possible, feed some legume hay or graze early legume pasture, since legumes are higher in magnesium than grasses.

In areas where tetany frequently occurs, feed cows supplemental magnesium. Supplementation increases blood magnesium levels and alleviates much of the grass tetany problem. Magnesium should be consumed on a daily basis.

Mature cows nursing calves and grazing new spring grass in western South Dakota where grass tetany frequently occurs, were protected from grass tetany by feeding 6 grams of supplemental magnesium daily. In Virginia, the magnesium requirement for lactating beef cows was found to be 18 to 22 grams daily to maintain serum magnesium at 2.0 milligrams per 100 milliliters of serum. The amount of supplemental magnesium for cows nursing calves in areas of Nebraska where grass tetany frequently occurs appears to be 9 to 15 grams per head daily, beginning at least 30 days before the normal grass tetany season. Up to 20 grams per day may be needed for heavy milking beef cows on pasture, or for cows grazing small grain or other lush spring pasture.

Magnesium oxide is one of the better and cheaper sources of magnesium. Since magnesium oxide contains 54 to 60 percent magnesium, the rate of feeding magnesium is about .04 to .08 pound per head daily. As magnesium is not well liked, it should be included in a readily acceptable protein or mineral supplement.

Adding magnesium oxide to a supplement at the rate of 75 to 150 pounds per ton when 1 pound per head is fed daily, or 37.5 to 75 pounds per ton when fed at the rate of 2 pounds per head daily, is the best way to provide supplemental magnesium for many cattlemen. It can be added to a high protein mix before cows go to grass. After the cows are turned to grass, a grain cube will probably be more economical and more palatable.

Salt-mineral mixes can be satisfactory carriers for magnesium when consumption of salt is managed to regulate intake. Feed no other salt when using the mix as a magnesium carrier. Salt content and palatability of the magnesium-mineral mix can be adjusted to assure adequate intake by adding grain, molasses, soybean meal or cottonseed meal.

When feeding free choice mixes, whether commercial or home mixed, check to see that cattle are consuming the desired amount. If not, modify the supplement to increase or decrease intake by increasing or decreasing 1) palatability, 2) the number of locations that the mineral is fed, or 3) the amount of salt or magnesium oxide in the mix.

We suggest that salt-mineral mixes contain 10 to 15 percent magnesium. Range cubes should contain 2.25 to 4.5% magnesium when fed at the rate of 1 pound per head daily.

For commercial mineral supplements guaranteeing a minimum percentage of magnesium, you can calculate daily magnesium intake as follows: pounds intake daily x 454 (grams per pound) x % magnesium. For example, 100 cows consuming 140 pounds per week of a salt-mineral mixture

containing 15 percent magnesium would consume approximately 13.6 grams of magnesium per head per day ($140 \text{ pounds} \div 100 \text{ cows} \div 7 \times 454 \text{ grams/lb} \times .15 = 13.6 \text{ grams/day}$).

Some simple mixtures that may be suitable for preventing grass tetany are shown in *Table I*. For each mix, adjust salt and/or the number of mineral feeders to maintain about 25 to 27 pounds of magnesium oxide per 100 cows per week.

Immediate Treatment

Cattle afflicted with grass tetany need immediate treatment. The most common treatment is an intravenous injection of at least 500 cc of a dextrose solution containing both magnesium and calcium. Consult your local veterinarian regarding recommended preparations and dose rates. Some veterinarians prefer to inject magnesium sulphate intravenously. Four hundred cc of a solution of 25% magnesium sulphate injected under the skin at two locations will give a relatively high level of magnesium in the blood in 15 minutes and may be effective as a temporary treatment when your veterinarian is not immediately available.

Decreasing losses from grass tetany depends on using one or more of the suggested preventive management practices, and timely treatment of affected animals.

Table I. High magnesium salt-mineral mixtures for reducing hypomagnesemia.

	<i>Mix 1</i>	<i>Mix 2</i>	<i>Mix 3</i>
Feeds in Mix	%	%	%
Magnesium Oxide	25	25	25
Dicalcium Phosphate	25	25	35
Salt	25	20	20
Ground Corn	25	30	20
Composition			
Magnesium	13.5-15	13.5-15	13.5-15
Phosphorus	4.5-5	4.5-5	6.5-7
Calcium	6	6	8.5



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