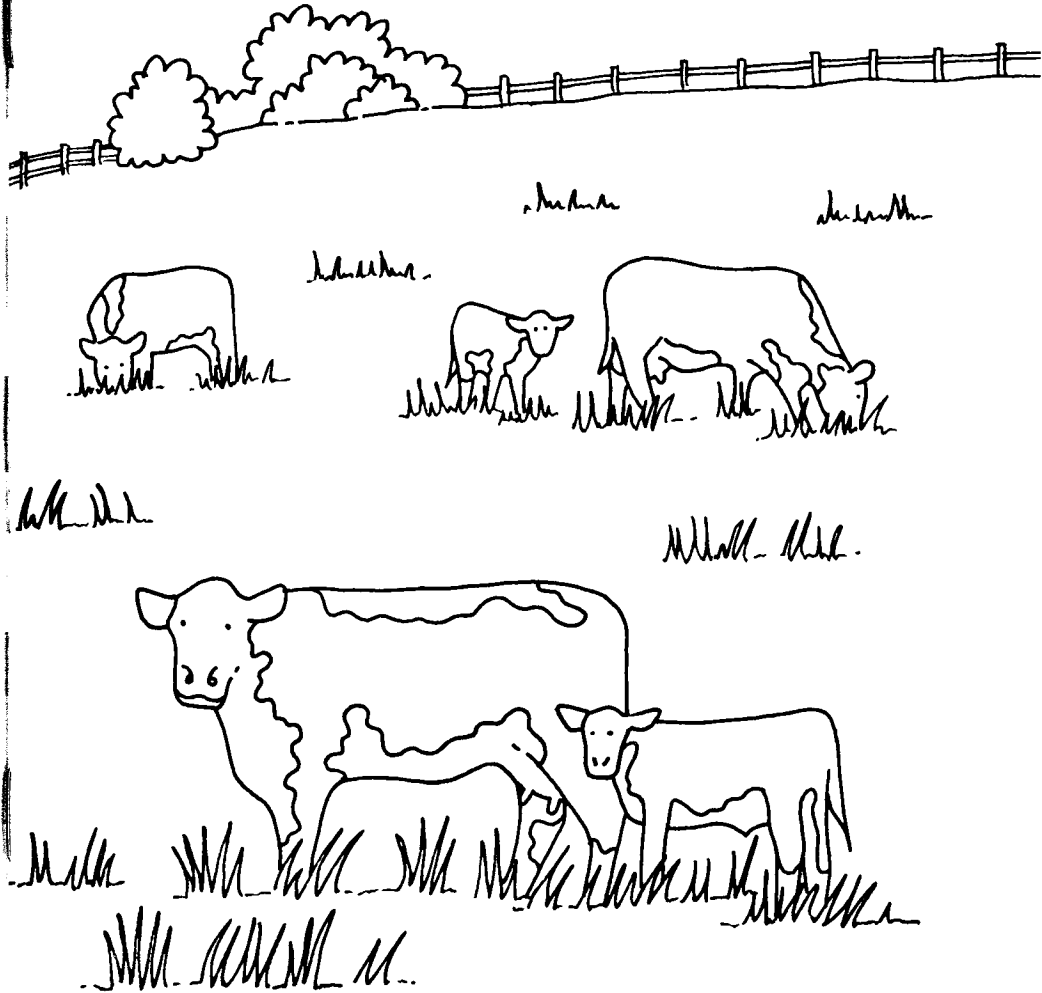


# Controlling Grass Tetany



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## Controlling Grass Tetany

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Grass tetany is a nutritional disease that occurs in beef and dairy cattle and sometimes sheep. Deficient levels of magnesium in the diet cause the disease, which is responsible for the deaths of many cows in the United States and other countries. Grass tetany is sometimes called hypomagnesemic tetany, lactation tetany, grass staggers, or winter tetany.

Cows are particularly susceptible to tetany when nursing a calf or producing milk. Sometimes pregnant animals die from the condition. Older cows are more susceptible than those with their first or second calves. Also, cows that are herded or worked may be more susceptible to the disease.

### Recognizing Grass Tetany

Cows are most likely to get grass tetany soon after they are turned out on spring pasture. The problem may also occur when animals are on field crop aftermath or poor quality hay. In mild cases, milk yield is decreased and the animals are nervous. These signs may indicate the need for preventive measures. In more severe cases, affected cows may avoid the rest of the herd, walk with a stiff gait, and

lose their appetite. They are nervous, have staring eyes, and keep their head and ears in an erect position. Also, they stagger; have a twitching skin, especially on the face, ears, and flanks; and lie down and get up frequently. Animals may be irritable and behave aggressively.

After a time, extreme excitement and violent convulsions may develop. Animals lie flat on their side, the forelegs pedal periodically, saliva flows freely, breathing is labored, and the heart pounds. If treatment is not given at this stage, animals usually die during or after a convulsion.

Stockmen who have not previously seen grass tetany should consult a veterinarian, Extension livestock specialist, county agent, or other person who has had experience with the problem.

Grass tetany should not be confused with nitrate toxicity. In cases of nitrate toxicity, the blood is brown. Also, there is a grayish to brownish discoloration of white areas on the skin and on the non-pigmented mucous membranes of the mouth, nose, eyes, and vulva. On some pastures, the hazard from nitrate toxicity and from grass tetany may occur at the same time.

If animals are deficient in calcium, they may be sluggish instead of nervous as they are when they have magnesium deficiency. Animals may have a calcium and magnesium deficiency at the same time, thus masking the signs of

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magnesium deficiency. In wheat pasture poisoning, animals may be deficient in both calcium and magnesium.

If a laboratory diagnosis shows that the blood serum contains less than 10 parts per million (ppm) of magnesium or if the urine contains less than 20 ppm of magnesium, the animal is in acute danger of having a convulsive attack of grass tetany.

#### Occurrence

Grass tetany is common during cool, cloudy, and rainy weather; and often occurs when cool weather is followed by a warm period. Animals get grass tetany most often when they are grazing cool-season grasses or small grain pastures in spring or fall. Rapidly growing lush grasses are the most dangerous. Grass tetany has occurred on orchardgrass, perennial ryegrass, timothy, tall fescue, crested wheatgrass, bromegrass, and winter annuals such as soft chess. It has also occurred on small grain pastures including wheat, rye, and oats.

Grass tetany also occurs when animals are being wintered on low magnesium grass hay, corn stover, and occasionally on low magnesium alfalfa hay. It is not common on legume pastures or in animals wintered on legume hay.

Grass tetany is most likely to occur on pasture plants grown on soils that are low in available magnesium and high in available potassium. If calcium is low as well as magnesium, tetany is more likely to occur. Many State soil-testing laboratories provide information on

the danger of tetany on pastures, and can recommend corrective fertilization or dolomitic liming practices.

The use of high rates of nitrogen and potassium fertilizer has sometimes been associated with increased grass tetany. Heavy applications of broiler house litter or other manures high in nitrogen and potassium may also increase the hazard of grass tetany.

Forage grasses should be analyzed when a grass tetany hazard is suspected. Forage containing less than 0.2 percent magnesium and more than 3 percent potassium and 4 percent nitrogen (25 percent protein) are especially likely to cause tetany. Forage that is high in potassium and nitrogen should have a magnesium concentration of at least 0.25 percent.

#### Treatment

Treatment of tetany cases can be successful if given early and without excessive handling of the affected cows. Under range conditions, 200 cubic centimeters (cc) of a saturated solution of magnesium sulfate (50 percent) injected under the animal's skin places a high level of magnesium in the blood in 15 minutes.

Some veterinarians use intravenous injections of chloral hydrate or magnesium sulfate to calm excited animals and then follow with a calcium-magnesium gluconate solution. If the animal again goes into convulsions, a second dose of calcium-magnesium gluconate solution may be required. Intravenous injections should be administered slowly by a trained person because there is danger of heart failure if they are given too rapidly.



*Injection of calcium-magnesium gluconate into the bloodstream of a cow with grass tetany. PN-4045*



An inductively coupled argon-plasma vacuum spectrometer can be used for measuring the level of magnesium in plants, soils, blood, and urine. BN-50370

An enema of 60 grams (2 ounces) of magnesium chloride ( $MgCl_2 \cdot 6H_2O$ ) in 10 ounces of water has been helpful. The enema may be given with an esophageal or oral calf feeder with the probe inserted 25 cm (10 inches) into the anus. Magnesium is absorbed through the walls of the large intestines and the lower bowel.

Oral administration of magnesium, in place of intravenous injections or enemas, has not been effective in treating tetany cases since too much time is required for the magnesium to reach that part of the GI tract where it can be absorbed.

For followup treatment, the animal should be removed from the tetany-producing pasture and fed hay and concentrates. Also, 30 grams of magnesium (2 ounces calcined magnesite containing 85

percent  $MgO$ ) should be given daily. Force-feeding of magnesium may be necessary, but after a week the amount can be greatly reduced.

Cows that get tetany are likely to get it again later in the season or in later years. However, these cows may be high producers.

#### Preventing Grass Tetany

Where a diagnosis of grass tetany is made, one or more of the following practices may be useful in preventing new cases from occurring:

(1) Applying magnesium fertilizer and dolomitic limestone to the soil may increase the magnesium concentration in plants, although it may take several years before there is much effect from the dolomitic limestone. Incorporating dolomitic limestone below the soil surface will increase its effectiveness.



Measuring the pH of nutrient solution used for growing plants in a chamber with controlled levels of light and temperature. BN-50371

The effect of magnesium fertilizer or dolomitic limestone is generally greatest on coarse-textured acid soil that is low in potassium. On some soils, very high rates are required to appreciably increase the magnesium concentration in plants.

Local recommendations should be secured before magnesium fertilizer or dolomitic limestone is used. The amount of magnesium required may vary considerably, depending on the soil pH, texture, and potassium content. Local recommendations should also be followed to avoid using too much nitrogen and potassium fertilizer.

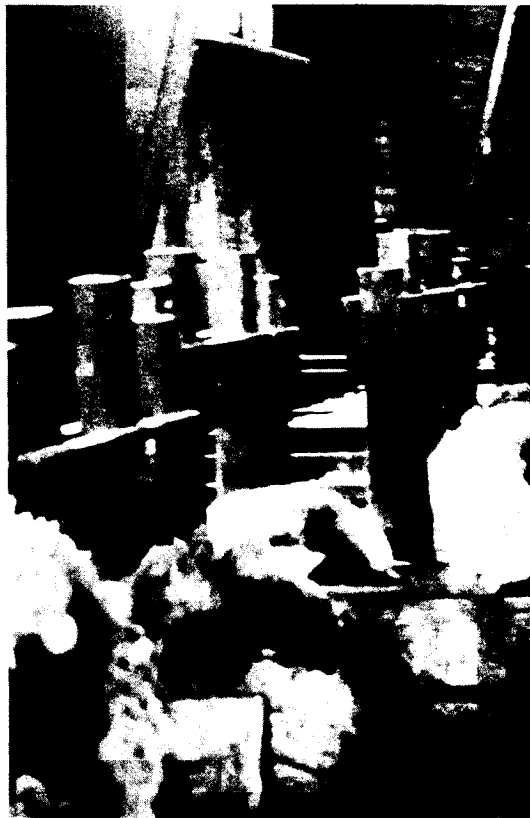
(2) Dusting pastures with magnesium oxide (MgO) as finely powdered calcined magnesite is useful to increase the intake of magnesium by cattle. Rates of 15 to 30 pounds of MgO per acre can be used, with the lower rates suited to cases where cattle are moved to new pastures every 2 or 3 days.

To help keep rain from washing the MgO off the foliage, a water slurry of 10 percent MgO and 1.5 percent bentonite can be applied to the grass with a suspension fertilizer applicator.

Where forage yields are low, as in semiarid regions, dusting or spraying pastures with MgO is not practical.

(3) Supplementing magnesium in the animals' diets is recommended. Commercial grade magnesium oxide (MgO), magnesium chloride (MgCl<sub>2</sub>), magnesium carbonate (MgCO<sub>3</sub>), and magnesium sulfate (MgSO<sub>4</sub>) are good sources. Dolomitic limestone and magnesite rock are poor sources of magnesium; therefore, they are not recommended.

Animals can be fed a supplement of special high-magnesium mineral blocks or mineral salt mixtures.



*Studying the effect of diet on the magnesium status of sheep. PN-4043*



These are available from feed stores, or information on mixing them at home can be obtained from State experiment stations. They often contain dried molasses, grain, or some other material to make them palatable to animals. Also, magnesium may be added to a protein supplement or silage.

Licking wheels or licking belts are sometimes used to slowly dispense magnesium oxide or magnesium sulfate in molasses. One must be certain that the magnesium remains in suspension or solution, and that the



*Spreading a mixture of magnesium oxide and bentonite on grass pastures. PN-4044*

magnesium concentration is high enough for the animals. Milking cows or cows nursing calves should get magnesium supplements daily.

Since tetany-susceptible animals are usually unable to obtain very much magnesium from their body reserves, the daily supplement is very important. If forage is high in nitrogen, supplementing it with hay, molasses, or grain may increase magnesium availability to the animals. Animals feeding on lush grass, however, are not likely to eat much dry hay or mature standing forage.

Throughout the high-risk period, a minimum of 10 grams of magnesium should be given to beef cattle every day. For beef cows nursing rapidly growing calves, 20 to 25 grams is better. For beef cattle on hay, 8 to 10 grams per day is adequate.

For dairy cows, 30 grams of magnesium (60 grams or about 2 ounces of commercial grade MgO) per day is recommended. For calves, 4 to 8 grams per day (8 to 16 grams of MgO) is needed, depending on their ages.

Lactating ewes, just after giving birth during the tetany-susceptible period, should receive about 3 grams of magnesium (6 grams of MgO) per day.

Magnesium supplements should be started several weeks before the tetany period to get the animals accustomed to them.

(4) Adding magnesium sulfate to drinking water is helpful. Some diarrhea may occur, but this has not been a problem. Magnesium acetate or magnesium chloride may be used instead of magnesium sulfate. To be effective, the drinking trough must be the only source of water.

(5) Using pastures that are likely to cause grass tetany to graze steers and dry stock, and legume hay or high-legume pastures to feed milking cows and cows nursing calves is also recommended.

#### **Film and Videocassettes**

A 12-minute, 16-millimeter film and 1/2- and 3/4-inch videocassettes on grass tetany are available. For more information, contact your local Extension office or one of the authors.