

Trouble With Tetany



[PHOTO BY SHAUNA ROSE HERMEL]

Changes in spring grazing could put your cows at greater risk of developing grass tetany.

Story by
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Grass tetany is nothing new to the seasoned rancher, but as a growing number of beef producers shift from spring-feeding baled hay to the more cost-effective practice of field-grazing fast-growing, cool-season grasses and forage grains, we see a resurgence of the condition. "It is in this kind of forage where we will see the nutrient balance go off," says Ron Lemenager, a Purdue University Extension beef specialist.

He explains that tetany is a metabolic disorder in ruminants precipitated by a specific mineral deficiency. "Grass tetany is caused by low blood magnesium (Mg) levels in cows," Lemenager explains. "It usually happens in the spring, when grass is starting

to green up and grow, the water content is high, and the minerals and other nutrients in the plants are diluted. When that occurs, magnesium is often one of the deficient minerals."

Chris Allison, New Mexico State University (NMSU) range management specialist, says a 1,000-pound (lb.) lactating cow should consume approximately 30 lb. of dry matter (DM) per day. If the forage is lush and contains only 20% DM, the animal must eat 150 lb. of feed per day to meet the requirements — a substantial chore for even the hungriest cow.

The effects of such a deficiency can be exacerbated by imbalances in other minerals such as potassium (K) and nitrogen (N). "Whenever you have a higher level of potassium — which is common in new, lush, vegetative regrowth starting in the

spring — magnesium deficiency issues can be aggravated," Lemenager says. "This can also apply to nitrogen."

As far back as 1966, the *New Zealand Journal of Agricultural Research* reported that there was an inverse relationship between the total nitrogen content of forage and the availability of forage magnesium to cattle.

Allison notes that, based on current evidence, forages containing less than 0.2% magnesium and more than 3% potassium and 4% nitrogen [25% crude protein (CP)] are especially likely to cause tetany. Forages that are high in potassium and nitrogen should have at least 0.25% magnesium.

When an animal is on high-nitrogen forage, the rumen produces a large amount of ammonium. Under these conditions, dietary magnesium may be converted to the relatively insoluble hydroxide, thereby lowering availability to the animal's tissues.

This could be particularly troublesome for ranchers who graze their cows on land that has received applications of nitrogen-rich dairy, hog or chicken manure. Allison recommends testing these sites before you bring in your cows.

Tetany in cows

Grass tetany — also called grass staggers, wheat-pasture poisoning, lactation tetany

and hypomagnesemia — causes a variety of symptoms, including grazing away from the herd, irritability, muscular twitching in the flank, wide-eyed and staring behavior, and skittishness.

Steve Parish, Washington State University large animal veterinarian, sees tetany as a particularly frustrating condition. Raised on a Nevada ranch where it was relatively common, he recalls that animals suffering from the disorder have a tendency to be in a hyperalert state.

"Anyone who has been around grass-tetany cows knows that there are risks associated even with approaching the animal," he says. "Just the effort of it trying to flee could send it into convulsions."

Parish attributes these incidences to the fact that the animal, through its magnesium deficiency, has depleted the electrolytes in its body to the point it can no longer regulate the relationship between the nervous system and the skeletal muscles.

Lemenager notes that as the condition progresses, it affects how the nerves fire and how the legs and skeletal structure function. Cows with an advanced case of this disorder become uncoordinated, thrash about, and have muscle tremors and staggers. If not treated, most will collapse, go into convulsions and die.

Parish adds that in the field, the best way to determine if an animal died of grass tetany is to remove the eye and send it to a lab for testing. "The fluid in an eye remains stable for a couple of days," he says. "When run through a lab it will represent the magnesium status of the cow."

Bad news for spring calvers

Both Lemenager and Parish agree the animals most susceptible to grass tetany are older, spring-calving beef cows. "We see it is most



Manure applications that increase levels of potassium and nitrogen levels in soil are proven to reduce availability of dietary magnesium. [PHOTO BY ED HAAG]

common in transition cows — animals that are in the last stages of gestation and the first stages of lactation,” Lemenager says. “That is when their system is most depleted and under the greatest stress.”

Parish believes depletion and stress also play roles in the susceptibility of older cows. “Most of these cows have had several calves, have gone through the stresses of lactation, and it takes a toll on their bodies,” he says. “They also have a tendency to be heavier milk producers than the younger animals. This, in itself, can lead to calcium (Ca) and magnesium depletion.”

For the spring-calving producer, this is bad news on two fronts. With the dependency on early spring grazing on the rise, producers must be alert to the risks associated with grass tetany and consider the fact that some of their best, proven producers are at greatest risk.

forms, including magnesium mineral blocks, salt mixtures and liquids. They can be added to protein supplements, silage and even stock water. Allison notes that, assuming a 20% availability, the cow’s magnesium requirement for maintenance and lactation would be from 13 to 15 grams (g) per day. However, situations may require at least 36 g to prevent development of tetany in herds.

Parish recommends consulting a local livestock nutritionist about the type of supplement best-suited for the area. “If anyone knows how to deal with tetany on a local level, it is your nutritionist,” he says. “He is the one to tell you what works and what doesn’t.”

Lemenager says his favorite recipe for controlling tetany is an on-farm mineral mix with approximately 25% trace

mineralized salt, 25% magnesium oxide, 25% dicalcium phosphate and 25% of something that increases palatability, like ground corn or dried molasses. Each cow should consume 8 ounces (oz.) of that mixture a day to manage grass tetany.

One innovative approach to get cows to ingest magnesium is suggested in NMSU’s Cooperative Extension Bulletin B-809, titled “Controlling Grass Tetany

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Effective tetany control doesn’t have to involve major expenses. It can be as simple as delaying turnout until grasses reach at least 6 in. in height.

Ounce of prevention

As a veterinarian and one who is familiar with the mortality levels in cows already showing the symptoms associated with grass tetany, Parish is an ardent supporter of prevention. “I cannot emphasize enough the importance of dealing with the tetany problem before it shows up in the cows,” he says. “Unfortunately, once it does, we have often sustained losses that may have been preventable.”

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Meanwhile, he recommends feeding stored forage a little longer or supplementing the grazed grass with baled hay. This practice provides some DM and a little more nutrient-dense feed while the new grass is low in nutrient profile.

Another low-input, low-cost approach to preventing grass tetany is segregating animals that are at highest risk and pasturing them on sites that are known to have adequate magnesium. Pasture mixes that include legumes such as clover and alfalfa have higher concentrations of magnesium than do pastures with only cool-season grasses or forage grains.

Supplements do work

Probably the most common way to prevent grass tetany in lactating cows is to feed them magnesium supplements. These are available in a variety of

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in Livestock.” This involves dusting pastures with magnesium oxide (MgO). Rates of 15 to 30 lb. of magnesium oxide per acre are recommended, with lower levels for pastures where cattle are moved every two or three days. To help keep rain from washing the magnesium

oxide off the plants, a water slurry containing 10% magnesium oxide and 1.5% bentonite can be applied with a suspension fertilizer applicator. Where forage yields are low, as in many arid regions, dusting or spraying pastures with magnesium oxide is not practical.

Take it to the soil

Keith Johnson, Purdue University forage crop specialist and professor of agronomy, says the best way for cow-calf operators to avoid grass tetany is to make sure their cows get plenty of magnesium. One way is by making sure the soil producing the forage contains appropriate levels of the mineral.

He adds that in areas where dolomite limestone (high in magnesium) is available and hauling is not prohibitive, increasing the level of magnesium in the soil is one solution. Soil samples should be taken from late spring to early autumn to determine what volume of limestone is needed. If natural dolomite is not available, magnesium fertilizer might offer a viable alternative. The effect of magnesium fertilizer or dolomitic limestone is best on coarse-textured acidic soils that are low in potassium. As with the dolomite, soil samples and professional input should be sought before applying magnesium fertilizer.

Parish notes that in the Northwest, where circle irrigation is common, magnesium can also be sprayed through a pivot system, both as a soil amendment and/or as a foliar application.

When tetany strikes

Lemenager's advice to ranchers who recognize the symptoms of grass tetany in cows is to act quickly. "If you have a cow that is staggering, you need to have your veterinarian out as quickly as possible, because the treatment for a cow that's got grass tetany is an intravenous infusion of a dextrose solution that's high in both calcium and magnesium," he says. "High calcium helps in magnesium absorption. Some producers might even feed a legume-type hay to these cattle because legumes tend to be higher in calcium and magnesium than grasses."

Parish warns that cows in the early stages of grass tetany should be handled gently, avoiding stress and exertion when possible. Driving, roping or restraining the animal will frequently result in death. "These animals are in very precarious situations," he says. "Heart failure is a real possibility if they get too worked up."

When he treats cows for tetany, he often turns to a product designed for treating milk fever. "Most of those products are high in both calcium and magnesium," he says. "For those who want more magnesium in the mix, they can add 100 milliliters (mL) of a 20% magnesium chloride or magnesium sulfite solution to 500 milliliters of off-the-shelf product."

