

Reducing the Risk of Grass Tetany

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What is grass tetany?

Grass tetany, or hypomagnesmic tetany, occurs when Magnesium (Mg) levels in a cow's blood are too low. This is caused by a low content or availability of Mg in pasture or hay which occurs when the forage is low in Mg or when the forage is high in nitrogen or potassium relative to Mg. The latter often occurs after heavy application of mineral fertilizers or manure. A plant's Mg content is depressed in cold soil when there is inadequate phosphorus, a mineral necessary for Mg uptake by plants. Grass hay crops grown under cool, moist conditions, and those that have been rained on, often contain low levels of Mg and are at risk for causing winter tetany in beef cows.

Soil fertility management

The risk of grass tetany can be reduced by proper soil fertility management. When soil test Mg is in the low to medium range (less than 250 lb. Mg/acre or less than 12% of the soil cation exchange capacity) use high Mg limestone (dolomitic limestone) to increase soil test Mg and plant Mg uptake. High quality dolomitic limestone contains 12 to 13% of actual Mg or 20 to 22% Mg oxide equivalent. The higher cost of this lime is justified by the long-term advantages in plant and livestock nutrition and health. One ton of dolomite (12% Mg) per acre adds 240 pounds of Mg/acre to the soil. When the soil contains over 250 pounds of Mg/acre, it is generally safe to use high calcium lime (calcitic lime) to correct soil pH. For optimum crop production, soil test values for nutrients reported as part of the soil cation exchange capacity (CEC) should be 70 to 80% calcium, 12 to 15% Mg, and 3 to 5% potassium.

Cold soils reduce the availability and uptake of soil phosphorous, a mineral plants require for the uptake of Mg. Soils testing high in phosphorous help ensure that plants are able to take up Mg, reducing the risk of tetany. The freezing and thawing of soil during the winter releases potassium from the clay, allowing grasses to take up extra potassium in the spring. This is accentuated when nitrogen is applied to grass pastures in the spring. Avoid applying potassium or nitrogen fertilizer to grass pastures in early spring to reduce the risk of tetany. Apply potassium fertilizer when plants need it most; in late summer and early fall. Likewise apply nitrogen to pastures after the soil has warmed in the spring. Another option is to apply nitrogen in the late summer or early fall to stockpile forage for fall grazing. Grasses benefit from nitrogen at this time of year since tiller buds needed for growth next year develop in the fall. Also nitrogen recycled through manure and urine increases grass growth the following spring.

Legume management

Legumes contain more Mg than grasses, so increasing the legume content in pastures and hay fields reduces the risk of grass tetany. In many cases this is accomplished by correcting the soil pH using high Mg limestone, phosphorous, and potassium (if low or medium) according to soil test, then frost-seeding clovers in the winter. When managing for increased legumes in grass-based

pastures or hayfields, do not apply nitrogen in the spring or early summer; nitrogen will stimulate the grasses that tend to smother the legumes, especially seedling legumes. Legumes benefit from rotational grazing, and from fall grazing with adequate rest to ensure plant health and rooting vigor. Proper fall grazing stimulates clover growth the following spring.

Legumes pay for themselves. Well managed grass-legume stands produce as much forage as pure grass hay fertilized with 150 pounds of N/acre. Animal production per head is greater on grass-legume pastures than straight grass pastures, with yearling steers gaining an additional 0.25 to 0.33 lb/day, backgrounded calves gaining an extra 0.50 lb/day, and dairy cows producing 6 to 10 more pounds of milk/day. Cattle and sheep can also eat more forage when it contains legumes. Increased consumption accounts for an increase in performance on forage-containing legumes.

Supplementation with Mg

Older cows, cows in early lactation, and especially old cows in early lactation, are most prone to grass tetany since Mg uptake decreases as cattle age, and since a cow's Mg requirement is highest in early lactation. Cows in early lactation need a ration containing 0.20% Mg (dry matter basis) while they only need 0.12% Mg during gestation. Growing and finishing cattle need 0.10% Mg. When cows in early lactation are fed forages testing less than 0.20% Mg, also feed them a supplement of Mg oxide (60% Mg) in mixture with salt, other minerals, and grain. Ensure that each animal gets about 2 ounces of Mg oxide (about 50 grams) each day. Commercial mineral mixes containing adequate Mg can do an excellent job reducing the risk of grass tetany.

Summary

Grass forage grown on soils testing low or medium in Mg may produce forages that are at high risk of causing grass tetany, especially when fertilized with nitrogen or potassium during cool, wet weather. The risk of grass tetany is reduced by the use of high Mg lime to increase soil test Mg when soil pH is low, and by applying potassium and nitrogen fertilizer in late summer or early fall. Early spring applications of phosphorous will cause no problems since phosphorous is needed by plants to take up Mg. Growing legumes in place of using nitrogen fertilizer helps reduce the risk of grass tetany. Supplementation with Mg oxide will help reduce the risk of grass tetany when cattle are fed forages low in Mg. Be sure to soil test hay meadow and pasture soils and apply recommended lime, phosphorous, and potassium in the fall. To optimize livestock nutrition and health, forage-test your hay crops to learn when Mg supplementation is needed during the fall, winter, and spring.

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