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Prevention and Treatment:

Grass Tetany

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Lush, green, rapidly growing grasses present a considerable risk for grass tetany, regardless of season. The combination of high potassium and low magnesium and calcium in these forages is thought to be the primary cause of grass tetany. Because of the increased forage production and growth rate, cattle grazing fertilized pastures are generally at higher risk.

The principal factor that influences concentration and availability of magnesium to both the plant and the animal is potassium. High concentrations of potassium negatively affect soil magnesium uptake by plants. High nitrogen concentrations following fertilizer applications also may limit magnesium availability.

In addition, lush, rapidly growing forages typically contain high concentrations of potassium, which can reduce the availability of magnesium to livestock.

Grass tetany tends to occur most often in the early- to mid-spring following a cool period ($< 60^{\circ}\text{F}$), when grasses are lush and growing rapidly. It can also occur in the fall in new growth of both small cereal grains (e.g., wheat, oats, rye) and cool-season grasses, especially crested wheatgrass.

Pastures and hays of legumes and legume-grass mixtures are good sources of magnesium and calcium and are generally not a concern for grass tetany. Feeding legume-based hay or grazing pastures with a legume-grass mixture early in the grazing season can provide some supplemental magnesium to livestock.

Prevention

The most effective management strategy to address grass tetany is to prevent it.

Prevention can be accomplished several ways. One method to minimize risk is to delay turnout until the forage is more mature and is past the rapid growth stage (at least 6 inches tall). Delaying turnout also will reduce early-season grazing pressure on range and pastures, allowing soil moisture to be used efficiently to produce as much grass as possible for later in the grazing season.

Grazing non-lactating animals on high-risk pastures can reduce or eliminate problems with grass tetany. Grass tetany occurs most frequently in cows that are nursing young calves. Growing cattle, dry cows, or cows with calves older than four months of age are generally at lower risk for grass tetany.

One of the most effective prevention strategies involves supplementing magnesium while the cattle are grazing high-risk forages.

Cattle should receive at least .5 to 2 oz of supplemental magnesium per head per day to prevent tetany. Magnesium is not effectively stored in the body; beginning supplementation more than 2 weeks prior to the grazing period is not advantageous.

The most practical means of supplementing magnesium under range or pasture conditions is with a high magnesium block or mineral mix. Supplemental magnesium

may also be added in combination with a protein supplement, silage, or a liquid.

Because of the low palatability of magnesium supplements (especially magnesium oxide), cattle may refuse to consume the supplement. If they do not consume adequate levels of magnesium from a free-choice mineral mix, the supplemental magnesium should be combined with a more palatable feed (i.e. dried molasses, distillers grain, soybean meal) to help drive consumption.

Signs

Regardless of the prevention strategy used, cattle should be observed at least twice a day when they are first turned out on spring pasture. There are some clinical signs that can be used as indicators of grass tetany; however, the first sign is usually a dead animal.

An animal with grass tetany frequently stops grazing and appears nervous or high-headed. It will likely respond quickly and erratically to the slightest stimulus. As the condition advances, it may begin to stagger or experience twitching of the skin, followed by stiffening of the muscles and violent jerking convulsions with the head pulled back. It may also lie down and “pedal” with its legs and chew to the point of frothing at the mouth. If the convulsions subside, the animal may appear more relaxed; however, noises or touching of the animal, even to administer a treatment, may result in violent reactions.

Diagnosis

In most cases, diagnosis of grass tetany is done on the basis of history and characteristics of the pasture and affected animals: sudden death of early-lactation animals on fast-growing pasture and no characteristic lesions or abnormalities that can be found in the dead animal.

In live animals, decreased serum magnesium concentrations may be indicative of inadequate magnesium intake, therefore increasing the risk of grass tetany. In animals currently undergoing convulsions, magnesium may be falsely elevated due to magnesium leakage out of damaged muscle cells.

In dead animals, magnesium levels in urine, cerebrospinal fluid (up to 12 hours after death), and vitreous fluid (from the rear chamber of the eyeball; up to 48 hours after death) may be measured to diagnose grass tetany. These samples can be analyzed at a veterinary diagnostic laboratory.

Treatment

If an animal is suspected of having grass tetany, time is of the essence.

A veterinarian should be contacted immediately to administer a magnesium solution intravenously. Frequently, treatment can be given in range conditions.

The response to treatment depends heavily upon how advanced the condition is at the time of administration. Animals that have been down for 12 hours or longer are poor candidates for successful treatment; muscle damage may prevent these animals from rising even if their magnesium status is corrected.

Treatment is often complicated by the severe nature of the animal's convulsions and potentially aggressive behavior. This can make finding a vein for intravenous treatment challenging. When treating animals, practice caution to avoid being injured.

An intravenous solution containing magnesium (as borogluconate or chloride salt) and calcium is the treatment of choice. This solution is available by prescription through a veterinarian. Animals affected with grass tetany commonly are low in calcium also, so solutions containing both calcium and magnesium are preferred.

Solutions vary as to the concentration of magnesium present. An intravenous dose of 1.5 to 4 grams of magnesium is necessary to correct the magnesium deficit. Depending on the product used, a dose of 500 to 750 ml will achieve that level. Solutions should be administered slowly.

Animals should be left alone for 30-60 minutes following treatment before being stimulated to rise. This will allow time for magnesium concentration in the cerebrospinal fluid to return to normal, while avoiding the possibility of inducing further convulsions.

Relapses following the first treatment are not uncommon. Strategies to reduce relapse rates may include subcutaneous administration of magnesium preparations, rectal administration of magnesium solutions (enemas), and oral supplementation with magnesium drenches or gel preparations.

Consult a veterinarian before undertaking these additional steps.