

SPRING PASTURES - GRASS TETANY AND BLOAT

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Most cattlemen look forward to warmer temperatures and spring grass. As temperatures begin to warm, cool-season grasses and legumes begin a rapid growth phase resulting in the production of large amounts of lush, palatable, green pasture. Unfortunately, early in the growing season, these forages are very high in moisture content and nutrients are diluted. The result is that it is difficult for animals to eat enough dry matter to meet all of their nutrient requirements. Two unrelated, but equally important problems are commonly seen early in the grazing season – grass tetany and pasture bloat.

Grass Tetany

Grass tetany, sometimes called grass staggers or hypomagnesaemia, is a metabolic disorder of cattle related to a deficiency of magnesium (Mg). Early lactation cows are the most susceptible, with older cows considered more susceptible than those with their first or second calves. The logic is that older cows seem less capable of mobilizing Mg reserves from the bones than their younger counterparts.

Grass tetany usually occurs when animals are grazing lush pastures in the spring, but it can occur during the fall and winter as well. Grass tetany is typically seen in early lactation cows grazing cool-season grasses during cool, cloudy and rainy weather and often occurs when cool weather is followed by a warm period. Rapidly growing, lush grasses create the greatest problem. Grass tetany has occurred on orchardgrass, perennial ryegrass, timothy, tall fescue, crested wheatgrass, bromegrass, Kentucky bluegrass, annual ryegrass and small grain (wheat, oats, barley, triticale and rye) pastures. It can also occur when livestock are wintered on low Mg grass hay or corn stover. Fortunately, the risk of grass tetany decreases on pastures that contain over 30% legumes (examples: clovers, alfalfa, birdsfoot trefoil) or animals wintered on grass-legume hay.

The greatest risk for grass tetany is when pastures soils are low in available magnesium, high in available potassium and high in nitrogen. Pastures where a significant amount of manure has been applied often have this mineral imbalance and are considered more vulnerable. Soil testing is a valuable tool to provide insight into potential problems. High rates of nitrogen and potassium fertilizer are sometimes associated with increased tetany problems. Suspect forages should be analyzed. Forage containing less than 0.2 percent magnesium, more than 3 percent potassium and more than 4 percent nitrogen (25 percent crude protein) are likely candidates to create grass tetany problems. Some data suggest that low phosphorus levels can also contribute to increased grass tetany on these types of pastures. If a soil test indicates low soil Mg and low soil pH, a Mg containing limestone would be recommended to improve soil Mg and pH levels.

Unfortunately in many cases of grass tetany, symptoms are not noted and the only evidence is a dead cow. In mild cases, milk yield is decreased, and the animal is nervous. These signs indicate the need for preventive measures. Animals affected by acute grass tetany may suddenly stop grazing, appear uncomfortable, and show unusual signs of alertness, such as staring and

keeping their heads and ears in an erect position. Cows may also stagger, have twitching skin (especially on the face, ears, and flanks), and lie down and get up frequently. Once cows get to this point, they are easily excited and any stimulation may lead to startling reactions, such as continuous bellowing or running. A staggered gait pattern typically develops followed by collapse, stiffening of muscles and violent jerking convulsions with the head pulled back. Animals often lie flat on one side with periodic foreleg paddling, twitching of the eyes and ears, and a chewing motion that produces froth around the mouth. Between convulsions, the animal may appear relaxed. During this phase, any sound or touching of the animal, such as when administering treatment, may result in violent reactions. Animals usually die during or after a convulsion unless treatment is given.

To prevent grass tetany, animals should be fed a high Mg supplement or free-choice mineral (containing 8 to 12 percent Mg.) Magnesium may be added to a protein supplement, grain mix, silage or liquid supplement. The cow's Mg requirement for maintenance and lactation typically would be from 13 to 15 grams per day, but can be as high as 36 mg in unique situations. Magnesium oxide is the primary source of Mg in mineral supplements and it is unpalatable which results in low mineral intake. For this reason, something needs to be added to the mineral mix to increase palatability such as corn, soybean meal, or molasses. Magnesium sulfate is also a good source and is more palatable. If producers are feeding corn co-products (distiller's grains or corn gluten feed), adding additional sulfur to the diet in the form of magnesium sulfate could create a sulfur toxicity. The best recommendation is to feed a more moderate amount of Mg on an ongoing basis (include 2.5 to 3.5 percent Mg) as a preventative. This is especially important in herds having a higher percentage of older cows.

Treatment of cows in the early stages of grass tetany can be effective, but animals should be handled quietly and gently, producing the least stress and exertion possible. Any stress that causes excitement such as driving or roping can result in sudden death. A sterile solution of magnesium sulfate given subcutaneously is a common treatment and producers that have experienced grass tetany should contact their herd health veterinarian. Other treatments used by some veterinarians include intravenous injections of chloral hydrate or Mg sulfate to calm excited animals and then follow with a calcium-magnesium gluconate solution. Intravenous injections should only be administered slowly by a trained person, because there is danger of heart failure if they are given too rapidly. As a follow-up treatment, the animal should be removed from the tetany-producing pasture and fed hay and concentrates. Also, approximately 30 grams of Mg sulfate should be given daily. Cows that have grass tetany are more likely to get it again later in the season or in future years.

Pasture Bloat

Bloat is a digestive disorder characterized by an accumulation of gas in the first two compartments of a ruminant's stomach (the rumen and reticulum). Production of gas (primarily carbon dioxide and methane) is a normal result of rumen fermentation. These gases are usually discharged by belching (eructation) but, if the animal's ability to release these gases is impaired, pressure builds in the reticulum and rumen and bloat occurs. Pasture, or "frothy" bloat, results from the production of a stable foam and if not relieved, the pressure created by the entrapment of rumen fermentation gases in the foam can lead to death by suffocation in as little as one hour

or less. Bloat can occur on any lush forage that is low in fiber and highly digestible, but is most common on immature legume (clover and alfalfa) pastures.

Bloat can occur after as little as 15 minutes to 1 hour after they are turned out to a bloat-producing pasture. However, there is often a lag of 24 to 48 hours before bloating occurs in cattle that have been placed on a bloat-producing pasture for the first time. They may become bloated on the first day, but it is more common to see bloat on the second or third day. Often the animal bloats only mildly and stops eating and the discomfort is eventually relieved. In more severe bloat, the animal's rumen is distended (especially on the left side), it urinates and defecates frequently, bellows and staggers. Death, due to restricted breathing and heart failure can occur quickly if action is not taken.

Bloating usually occurs when hungry cattle are first turned onto legume pastures. It seldom occurs on grasses, (or pastures with at least 50 percent grass), coarser pastures, or hay. Bloat usually follows a heavy feeding or grazing period. Hungry or aggressive feeders are most susceptible which is why producers often see their "best-doing" cattle develop this condition. Other conditions also increase the incidence such as frost, dew or rain on the field. Bloat incidence is likely to be increased during periods of rapid plant growth in the spring or following a summer rain. Also, adaptation of animals to a particular feed is an important factor. As animals become adjusted to a particular pasture or ration, the rumen microbial population adapts and the animal is less susceptible to bloat.

While complete elimination of bloat is not realistic, there are management practices that can significantly reduce the incidence of bloat. These practices include the following: 1) begin grazing in the spring on pastures that are predominately grass or grass-legume (at least 50 percent grass) mixtures. This will allow the animal and the rumen microflora time to adjust to the pasture. 2) Make sure that the animal is full when first put onto pasture in the spring. Feeding of dry grass hay or corn silage to animals before turnout to fill the rumen can allow the animal and their rumen microbes time to adjust. 3) Animals fed several pounds of supplemental grain before turnout are less likely to bloat. 4) Delay turnout until the forage is dry following a dew or rain. 5) Avoid placing animals on legume pastures after a light frost. Watch animals already on these pastures when frost takes place closely for bloat. 6) Check animals for bloat carefully every two hours when beginning grazing. 7) Rotate pastures in a manner that assures animals are not excessively hungry when going onto fresh pastures. 8) Consider anti-bloat products that contain poloxalene (2-4 g/100 lb body weight/d) several days before turnout and during periods where bloat is likely. Effectiveness of this product depends on daily intake, therefore mixing it with a daily supplement is more effective than feeding in blocks on pasture. Another useful product is Rumensin[®] which has also shown efficacy in reducing the incidence of bloat. 9) Some animals are chronic bloaters. If a particular animal frequently shows signs of bloat, it may be best to remove that animal from the herd. 10) When renovating pastures in need of greater legume content, consider birdsfoot trefoil, a non-bloating legume. When using birdsfoot trefoil, do not graze too close or the stand will diminish.

Death may occur quickly, but usually does not take place until 2 to 4 hours after the onset of bloat. When the bloat becomes severe enough (acute), the animal collapses and dies quickly, almost without a struggle. Death is likely caused by suffocation, when the distended rumen

pushes against the diaphragm and prevents inhalation. When bloat is observed, immediately remove affected animals from pasture and offer dry hay. This will reduce the bloat problem in all animals that will eat. Forcing bloated animals to walk can increase belching. When handling an affected animal remember to move them calmly and quietly because breathing is impaired by the build up of pressure in the rumen. If the bloating has not been lessened once you get the animal to the pen, several options should be considered. They include: 1) stomach tubing – this involves restraining the animal and passing a rubber hose down the esophagus (taking care to avoid passing it into the animal's trachea) and into the rumen providing a mechanical release of the gas. If a standard-sized stomach tube is not available, a garden hose with an outside diameter of 2.0 to 2.5 cm can be used. The metal coupling on a garden hose must be removed to prevent injury to the mucous membranes of the mouth and esophagus. If a Frick speculum is unavailable, the operator will need assistance in holding the mouth partly open so that the animal is unable to chew the tube. With frothy bloat, the tube typically becomes plugged by froth immediately upon entering the rumen. The operator should clear the froth from the end of the tube by blowing through it and moving it back and forth to locate pockets of gas. With frothy bloat, it may be impossible to reduce the pressure, and an anti-foaming agent such as oil should be administered while the tube is in place. 2) Administration of a vegetable or mineral oil drench – this will reduce the surface tension and allow the stable foam gas bubbles to rupture. The rate for treatment is 300 to 500 mL (10 - 12 oz) for a 450 kg (1,000 lb) animal, administered in one dose. This treatment can be repeated several times within a few hours if necessary. 3) Trocar – this should be the last possible resort and should only be used when the animal is down and cannot be moved. Use of a trocar, a device that punctures the rumen from the outside is a rapid and effective means of releasing the gas, but it requires treating the animal with antibiotics because of the risk of peritonitis.

Conclusions

Death from grass tetany and pasture bloat can occur quickly and it is often too late when producers first observe animals in distress. Benjamin Franklin once said, “an ounce of prevention is worth a pound of cure” and that advice fits both grass tetany and pasture bloat. It is much easier and more cost effective to proactively manage cattle to prevent grass tetany and bloat than to treat it after it occurs. Prevention involves understanding the causes and development of a management plan to minimize their incidence, and then be prepared to treat an occasional animal that does develop symptoms.