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Bloat and Acidosis Prevention and Management

Jane Parish, MSU Extension Beef Cattle Specialist

Nutritional disorders in beef cattle can result in poor animal health, lowered production, and even animal losses. The National Animal Health Monitoring System reports that 7.0 percent of beef cattle death losses in the Southeast U.S. in 2005 were caused by digestive problems such as bloat and acidosis. The prevalence of death losses from digestive problems increased as herd size decreased.

Bloat

Cause

Bloat is a common digestive disorder in beef cattle. It occurs most often in feedlot cattle but affects cattle in all production phases. Bloat results when cattle are prevented from eructating (belching) and releasing of gases produced normally from microbial fermentation. Gas production may then exceed gas elimination. Rumen expansion from gases puts pressure on the diaphragm and lungs. This compression reduces or cuts off the animal's oxygen supply and can result in death by suffocation.

Frothy bloat (feedlot bloat) is the most common type of bloat. It results from the formation of a stable foam in the rumen that stops the animal from expelling rumen gases. This foam can cover the cardia (esophageal entrance from the reticulorumen) and prevent eructation. Frothy bloat occurs in cattle fed high grain diets but is not a major concern for many Mississippi cattle producers. However, "feedlot" bloat is a concern with cattle on high grain diets, for example, bulls on feed-based bull development programs.

Consumption of forages containing high levels of soluble protein (such as alfalfa, winter wheat, and white clover) contributes to stable foam production. This is called frothy pasture bloat or legume bloat. Legumes that contain leaf tannins help break up the stable foam in the rumen and are rarely associated with bloat. These tannin-containing legumes include arrowleaf clover, berseem clover, birdsfoot trefoil, sericea lespedeza, annual lespedeza, and crownvetch. Similarly, tropical legumes such as kudzu, cowpea, perennial peanut, and alyceclover rarely cause bloat. Bloat can also occur on lush annual ryegrass or small grain pastures, particularly in spring.

Free-gas bloat is another type of bloat that happens when the cardia or esophagus is physically obstructed or damaged or when rumen movement is depressed.

Clinical Signs

Cattle suffering from bloat swell rapidly on the left side and may die within an hour in

some cases. Sudden death from bloat is frequently cited in feedlots as a cause of cattle losses. Cattle may exhibit signs of discomfort by kicking at their sides or stomping their feet. Susceptibility to bloat varies with individual animals. Some animals display a tendency to bloat when contemporaries do not.

Management Guidelines

Do not turn shrunk or hungry cattle out onto lush legume or small grain pastures without first filling them up on hay. Bloat is still possible on these forages even after a frost. Bloat risk is lower when legumes begin to flower than with earlier plant growth. Use of forages containing condensed tannins can assist in bloat prevention. Cattle should be slowly adapted from forage-based diets to grain-based diets over a period of at least three weeks. Manage the nutritional programs of chronic bloaters carefully.

Poloxalene can be provided in a salt-molasses block or as a top dressing to feed according to label recommendations. If a poloxalene block is provided, make sure cattle consume the blocks at least three days before placing them on a pasture with a significant bloat risk. Remove other sources of salt, and place poloxalene blocks (30 pounds per four to five animals) where they will be easily accessible to the cattle. Feeding monensin can reduce the risk of both feedlot and pasture bloat. Monensin is reported to be more effective than lasalocid in controlling bloat, while poloxalene is more effective than monensin for bloat prevention.

Discuss bloat treatment options with a veterinarian. Poloxalene may be administered through a stomach tube to help break up the stable foam and allow the animal to eructate (belch). Do not drench a bloated animal because of the danger of inhalation and subsequent pneumonia or death. Feed coarsely chopped roughage as 10 to 15 percent of the ration in a finishing diet. A bloat needle (six to seven inches long) or a trocar can be used in extreme cases to puncture the rumen wall on the left side of the animal to relieve pressure inside the rumen. This treatment option should be considered a last resort as severe infections may result. Although there is no label claim, research indicates that monensin reduces the incidence and severity of frothy bloat.

Acidosis

Cause

Acidosis is a nutritional disorder often associated with a shift from a forage-based diet to a high concentrate-based diet or excessive consumption of fermentable carbohydrates. Acidosis may occur in cattle on high-grain diets common with youth livestock projects, bull development programs, and cattle finishing programs. It can also occur in stocker calves when self-feeders and high-starch feeds such as corn are used.

Acidosis is the result of low rumen pH. The typical pH of the rumen on a forage-based diet is 6 to 7. As the amount of forage or roughage in the diet decreases and the amount of concentrate increases, the pH of the rumen falls between 5 and 6 depending on the forage to concentrate ratio of the diet. Low pH supports the growth of lactic acid producing bacteria. Lactic acid is a very strong acid that reduces rumen pH even

further. Acute (severe) acidosis occurs when ruminal pH drops below 5.2, while subacute (less severe) acidosis occurs at a ruminal pH of less than 5.6. Laminitis, liver abscesses, and polioencephalomalacia often accompany acidosis.

Clinical Signs

Effects of acidosis on cattle may include rumen stasis (slowing or stopping of gut movement), diarrhea, and dehydration. Cattle appear weak, anorexic, and uncoordinated. Manure is often soft, gray, and foamy. Nutrient absorption may be impeded after animals recover from a bout of acidosis. Cattle with subacute acidosis may exhibit reduced but variable feed intake and decreased performance. Susceptibility to subacute acidosis may vary among animals. Acute acidosis can result in heart and lung failure and death.

Both subacute and acute acidosis can lead to rumenitis (infection of the rumen wall). The low pH from acidosis creates lesions in the rumen wall. Damage to the rumen wall from sharp objects (such as wire or nails) predisposes the animal to abscess formation. When rumenitis develops, liver abscesses often follow. Bacteria from the rumen that cause liver abscesses (*F. necrophorum*, *Actinomyces pyogenes*, *Bacteriodes spp.*) enter the blood supply through ulcerative lesions, hairs, or foreign objects embedded in the rumen wall. These bacteria then travel via blood to the liver.

Liver abscesses are most often seen in feedlot cattle. Severe liver abscesses may reduce feed intake, weight gain, feed efficiency, and carcass yield. Abscessed livers are condemned at harvest, regardless of abscess severity. Liver condemnations due to abscesses were observed in 13.5 percent of fed cattle in the 2005 National Beef Quality Audit resulting in about a two percent reduction in carcass weight per head. Abscesses were the primary cause of liver condemnations.

Management Guidelines

When cattle are exposed to a high-concentrate diet too quickly, acidosis may result. Fluctuations in eating behavior are often observed. To reduce the incidence of acidosis, utilize a warm-up feeding period where high-concentrate feeds are introduced gradually over a period of three to four weeks. Keep at least 10 percent roughage in the final diet to help moderate rumen pH. Forages and cottonseed hulls are both good roughage sources high in effective fiber.

While acidosis most often occurs during adaptation to concentrate-rich diets, chronic acidosis may continue during the feeding period. Feeding a combination of grains or feeding a dry grain with a high-moisture grain can reduce the risk of acidosis. Potential for acidosis is higher when feeding wheat than corn. Processing grains less thoroughly and limiting the quantity of feed should reduce acidosis incidence but may also lower animal performance. Good bunk management where all feed is consumed before the next feeding may minimize daily fluctuations in feed intake and reduce acidosis risk.

Feeding ionophores (monensin or lasalocid) can help reduce the incidence of acidosis. Ionophores may reduce intake and help moderate concentrate intake when calves are

started on higher concentrate diets. Adding bicarbonate, fat up to eight percent of the diet, probiotics, virginiamycin, or thiamin to the diet or increasing the protein content of the diet may decrease acidosis risk. Treatment for acidosis is similar to prevention efforts. Tylosin use is effective in decreasing liver abscess incidence. Virginiamycin and chlorotetracycline are also used in addressing liver abscess problems.

For more information on nutritional disorders in beef cattle, contact an office of the Mississippi State University Extension Service.