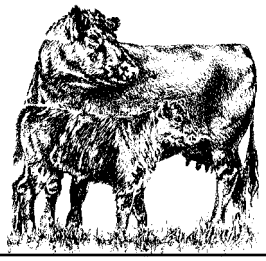

Western Beef Resource Committee *Fourth Edition*

Cattle Producer's Handbook

Animal Health Section 625

Bloat Prevention and Treatment

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Bloat is a form of indigestion marked by an abnormal distention of the rumen caused by accumulated gas. Gases produced in the normal rumen fermentation process are usually eructated or "belched up." When bloating occurs, these gases cannot escape. They continue to build up and cause severe distention of the abdomen, compression of the heart and lungs, and eventually death due to suffocation.

Etiology of Bloat

The two types of bloat—dry gas and frothy—can result in many varied and complex rumen reactions. Contributing causes of bloat include an inherited tendency for bloat, certain proteins in forage, the amount and rate of roughage intake, the coarseness of the roughage, the rumen microbial population, and enlargement of the lymph nodes between lungs, which compresses the esophagus or interferes with the function of the vagus nerves after respiratory infection or an esophageal blockage. Diagnosis can only be confirmed on necropsy.

Dry gas bloat is produced by interference with the normal eructation process, as with vagus nerve damage or esophageal blockage. In dry gas bloat, a stomach tube placed into the rumen will allow the gas to be released. In a case of frothy bloat, passage of a stomach tube results in release of little or no gas and the passage of foam. Dry gas bloat usually involves only an individual animal, while frothy bloat is often a herd problem, with several animals involved.

Normally, dry gas bloat is associated with feeding high concentrate grain rations in the feedlot or presence of a mechanical obstruction. Esophageal blockage is a mechanical obstruction, which may be the result of a potato, beet, or similar foreign object such as a frozen chunk of feed lodged in the esophagus.

Frothy bloat can occur in cattle fed high grain diets due to the growth of certain slime-producing bacteria. Frothy bloat is usually associated with the ingestion of legume plants such as alfalfa or clovers. Grazing legume pastures and/or feeding legume green chop or hay under certain conditions may produce frothy bloat.

Animal susceptibility to legume-produced frothy bloat appears to be determined by the texture, composition, and microbial population of the rumen contents. The occurrence of bloat seems to be highly associated with rumen fill at the time of cattle being grazed or fed the legume.

Research has demonstrated that bloated animals have significantly higher rates of chlorophyll concentrations, buoyancy of particulate matter, and rate of gas production than non-bloated animals. Apparently, the microbial colonization and retention of particulate matter provide active inocula for promoting rapid legume digestion. Consequently, gas production is enhanced when eating is commenced, but fermentation gases become trapped by buoyant ingesta. In frothy bloat, these gases are mixed in with the rumen contents forming a stable foam. This foam cannot be eructated.

Canadian scientists have concluded that higher foam production in bloat-prone cattle could be attributed to slower rates of passage of the liquid phase of ruminal contents. These combined results clearly indicate that the ruminal passage rate is an important factor in the etiology of legume bloat. Slower clearance enhances microbial activity and promotes gas production, which contributes to stable foam formation. Rapid clearance decreases microbial gas production, enhances protein bypass, and reduces the probability of bloat.

Canadian research has demonstrated that bloaters consumed 18 to 25 percent less alfalfa on average than non-bloaters. This result contradicts the old belief that the immediate cause of bloat is animals gorging on succulent feed. Bloat is associated with a lower consumption of feed, not overfill. Early, sub-clinical signs of bloat (gastric distress) may have reduced feed intake.

Two decades of bloat research at Kamloops, British Columbia, Canada, has revealed every cultivar of alfalfa (*Medicago sativa*) tested has caused bloat. However, the

legumes sainfoin (*Onobrychis viciifolia*), birdsfoot trefoil (*Lotus corniculatis*), and cicer milkvetch (*Astragalus cicer*) did not cause bloat. These alternate legumes are apparently bloat-safe.

In alfalfa, bloat is associated with the level of Fraction 1 protein and total soluble protein. This supports the concept of a decreased probability of bloat with advancing stages of plant maturity. Apparently, there is no association between alfalfa saponins and bloat (Majak et al. 1995). Even when alfalfa is in the early bloom stages of growth, the stage most likely to cause bloat, the probability of bloat varies widely. The incidence of bloat can vary from year to year, from day to day, and on many days there may be no bloat.

Bloat-inducing legumes, such as alfalfa and clovers, under different growing and environmental conditions may become more bloat provocative. Stage of maturity, plant height, moisture, soil fertility, and temperature are part of the complexity of grazing management.

Preventing Legume Pasture Bloat

Many methods have been used over the years to reduce the incidence of pasture bloat, but the most effective method is the daily supplemental feeding of Poloxalene, an anti-foaming agent that prevents frothy bloat for 12 hours, if fed in adequate amounts. Poloxalene can be fed as a top dressing on feed, in a grain mixture, liquid supplement fed free choice, or in a molasses-salt block. The challenge with each of these methods is to get an adequate intake of Poloxalene by each animal each day to prevent bloat.

Use of Poloxalene for bloat prevention may seem expensive, but it is cost effective when compared to the outstanding gains of cattle grazing improved alfalfa/clover pastures. Since obtaining a precise daily intake of Poloxalene may be difficult, a combination of bloat management methods should be used when possible.

Canadian scientists have extensively researched the ruminal cation status in cattle fed fresh alfalfa. The concentrations of Na^{+} and K^{+} were found to be correlated with bloat. Bloat is associated with a low concentration of Na^{+} but a high concentration of K^{+}. Levels of the divalent cations Mg^{+2} and Ca^{+2} were substantially lower but were also positively associated with bloat. These results suggested that manipulation of the cations through supplementation might provide a means of controlling bloat. However, Na^{+} supplements, with or without EDTA, which sequesters Mg^{+2} and Ca^{+2}, were ineffective in the prevention of bloat (Majak et al. 1995).

It is well established that the ion equilibrium in the rumen can be manipulated by ionophores such as monensin and lasalocid, which alter cell membrane permeability and increase ion transport. These feed additives, which are also antibiotics, may reduce the incidence of dry bloat but apparently do not prevent the incidence of legume frothy bloat. Many other products including various mineral mixes are being promoted as bloat preventative, but their effectiveness is in question.

Grazing Management Recommendations

Management techniques that are helpful in reducing the occurrence of bloat:

- Provide Poloxalene to animals 48 hours before turning out on legume pasture to help ensure that sufficient product is in the rumen when they are exposed to the conditions causing bloat. Note: Feeding grain may increase weight gain slightly and reduce forage intake, and is a convenient way to administer Poloxalene. The timing of grain feeding should coincide with the need for protection. Morning and evening is best, but if grain is fed only once a day, give it in early morning before the animals have an opportunity to fill on pasture.
- Fill cattle on dry roughage before turnout onto legume pastures.
- At initial turnout, wait until the pastures are dry (midday after dew is gone).
- Once the cattle are turned onto the pasture, leave them out and prevent disturbances. Corralling animals at night may be more harmful than useful.
- Grazing should be continuous and not interrupted.
- Graze alfalfa/clover pasture after plants begin to flower.
- Rotate cattle to new pastures during the afternoon.
- When feeding green chop, spread the forage intake over the whole day by feeding several times daily for continuous consumption.

Producers should be aware that the bloat potential of alfalfa is not lost after a "killing" frost. Grazing systems that promote continuous and rapid ruminal clearance are most likely to reduce occurrence of frothy bloat.

Due to the difficulty of managing pastures of mixed grass and alfalfa or clover, it is suggested management be directed to the legume plant growth. Planting an alternative bloat-safe legume in a pasture mix of grass and legume will eliminate the incidence of frothy bloat. Straight alfalfa or clover legume pastures can be successfully grazed by satisfactory management.

Managing Feedlot Bloat

Feedlot bloat occurs infrequently and death losses are minimal in well-managed feedlots. Most cases are "sub-acute" rather than "acute" where distress symptoms such as frequent urination and defecation, labored breathing, and restless movements are evident. Under these conditions, Poloxalene does not appear to be effective in preventing feedlot bloat. Changes in feeding and management offer the best means for preventing feedlot bloat.

Chronic bloat is more rare but it does exist. Most chronic bloaters do not die from bloat. In feedlot condi-

tions, veterinarians frequently observe bloat in cattle 2 days after a storm of wind and rain, which disrupts the feeding. In many regions, third and fourth crop alfalfa can be very bloat provocative.

The ration most commonly fed by feeders seeking information regarding feedlot bloat has included finely ground milo and loose alfalfa hay fed in separate bunks or finely chopped alfalfa hay mixed with the grain. Using these rations as a basis for discussion, the following are changes that may prove effective in reducing the frequency and severity of bloat. They are listed in order of preference:

1. Coarse chop the hay (2-inch stem length maximum) mixed with the grain.
2. Increase the ration dry matter.
3. Use a coarser roll on the milo.
4. Substitute low-quality legume or non-legume roughage for part or all of the alfalfa hay (adjust the protein, vitamin, and mineral supplement appropriately at the same time).
5. Feed 50 percent or more coarsely rolled corn or whole corn.

Feedlot bloat that occurs on high-concentrate or all-concentrate rations can usually be reduced by adding coarsely chopped roughage. Separation of the grain from the roughage and/or supplement seems to be involved. When this is a problem, change the ration to minimize separation. Canadian studies have indicated that adding moisture to barley a few hours before rolling (tempering) reduced fines and also bloat. Feeding of an Ionophore is said to have a beneficial effect.

Treatment

Acute bloat must be treated promptly if death is to be avoided. In the stages of severe bloat a few seconds delay may result in death.

Plan with a practicing veterinarian for emergency bloat treatment ahead of the pasture season. You will need (1) good handling facilities, (2) a rubber hose about 3/4 to 1 inch diameter and 8 to 10 feet long, (3) a supply of defoaming agent, (4) a large trocar, and (5) a sharp knife suitable for opening an incision into the rumen if the trocar fails to relieve the bloat. In addition, it is necessary to know how to use the hose and antifoaming agent, and how to puncture the rumen.

In moderate cases, the tube should be used to provide relief, but with frothy bloat this may not be enough. If the tube does not provide immediate relief, the defoaming agent will frequently break down the foam and permit passage of large amounts of gas through the tube or by belching. The antifoaming agent can be administered through the tube or by intraruminal injection. Drenching is more likely to result in inhalation causing immediate death or pneumonia.

In severe cases, the use of a trocar or large gauge needle may help buy some additional time for treatment. Insert the trocar at a point halfway between the last rib and hookbone on the left side 3 to 4 inches below the edge of the loin. If the foam is so viscous that the trocar opening is not large enough to give relief, and if the animal is in severe distress, a large opening must be made into the rumen as a last resort. Use a knife to open a slit about 3 to 4 inches long and spread it apart with your fingers. Keep at least one finger through the incision until the bloat is fully relieved. Otherwise, the rumen may move, causing the opening in the rumen to shift away from the opening through the belly wall and skin.

Large bloat needles may be adequate for relieving dry gas bloat. These needles are about 6 to 7 inches long and are supplied with a wire stylet to unplug them if necessary. They should be inserted high on the left side, the same as the trocar in frothy bloat.

Chronic bloat caused by enlargement of the lymph nodes between the lungs can be treated by having your veterinarian make a rumen fistula. This procedure consists of making an opening through the skin and muscle high in the left flank. The rumen is then sutured to the skin before it is opened to release the accumulated gas. The fistula is designed to remain open for 1 to 2 months. During this time, the lymph nodes should decrease in size and normal belching can resume. Normally, natural healing will close the fistula. If not, the veterinarian can surgically repair the opening. There are also "semi-permanent" trocars that can be used. Plastic "screw-in" trocars are available and very easy to use.

Perhaps the best way to eliminate problems from chronic bloaters is to send them to slaughter, particularly if they weigh 700 pounds or more.

References

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