

REDUCING THE RISK OF BLOAT

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Bloat refers to excessive accumulation of gas in the rumen. Bloat results when an animal can not eructate or "belch up" gases produced in the process of rumen fermentation. The gas may be in the free form or may be mixed with rumen contents in the form of froth. It occurs both on pasture and in feedlots and can be a major cause of death in cattle wherever intensive farming is practiced. Additional losses can include decreased milk production and reduced rate of gain. Although legumes may increase the opportunity for bloat to occur, fear of bloat should not keep you from using high quality legumes, such as alfalfa and clover, in your pasture. Reducing the endophyte effects of fescue with legumes is important for improved animal performance.

Pasture bloat (Legume)

Frothy bloat results from the production of a stable foam that does not allow gas bubbles to form free gas and be "belched" off. It usually occurs in cattle grazing lush legumes, such as alfalfa, ladino, or other white clovers. The danger of bloat is greatest when pasture plants are young, lush, and high in soluble protein. The disorder is due to the foaming properties of soluble leaf proteins, which are more prevalent in legumes.

The essential feature is that coalescence of the small gas bubbles is inhibited and intraruminal pressure increases because eructation (belching) cannot occur. This condition can arise from diets of lush legumes or winter wheat pasture; it may be seen with high-concentrate finishing ratios in the feedlot. Of the commonly grown legumes, alfalfa and ladino clover are classified as higher bloat risk, red clovers are moderate risk, and crimson and subterranean clovers as lower risk.

Current research supports both animal and plant characteristics as predisposing to legume bloat. Research has shown that some cows can be classified according to their susceptibility to pasture bloat into high or low susceptibility and the offspring show influences of their parentage. A number of inherited characteristics are related to bloat. Individual cattle have been classified as having either high or low susceptibility to legume bloat. High susceptible cattle have larger rumen volumes than non-bloating animals. There is a slower rate of passage of particles from the rumen in bloating cows. In a research study, cattle that bloated on a given day consumed 18 to 25% less alfalfa immediately before bloat than non-bloaters did in the same time period.

Adaptation of animals to a particular feed is an important factor. Animals may be at increased susceptibility for the short-term due to changes in rumen microflora. As animals become adjusted to a particular pasture or ration, they have less susceptibility to bloat. The claim that the risk of bloat may be reduced by waiting until the dew is off the alfalfa is true. A study demonstrated that cattle were 2 to 17 times more often likely to bloat when alfalfa grazing began between 7 and 8 AM than when they were fed 4 hours later.

There is a relationship between plant factors associated with bloat and the rapidity with which leaf structure is disrupted after ingestion. Bloat-inducing plants are more readily macerated, thus providing quicker bacterial access to the inner leaf cells. Spring (mid-March to mid-May) is the most dangerous season when the pastures are lush, young and the leaves of the plant contain high concentrations of soluble proteins. As the legume plant matures to early bloom stage, the fiber content increases and the risk for bloat decreases.

Legume bloat may resolve spontaneously if the animal stops consuming the bloat-producing feed and microbial digestion eliminates the froth-stabilizing factors.

Free-gas bloat

It is usually necessary to pass a stomach tube to differentiate free gas from frothy bloat. A stomach tube will deflate the free gas bloat. Milk fever can cause free-gas bloat, but the most common cause is when an animal has become cast on its side and cannot belch.

Diagnosis

A preliminary diagnosis is usually based on observation of the distended abdomen with extreme tightness of skin and distortion in the upper left side. It is usually necessary to pass a 3/4 inch to 1-inch rubber hose or stomach tube to differentiate free gas from frothy bloat. If it is pasture bloat, a stomach tube is usually not adequate.

The condition may be fatal if the distension is extreme enough to compromise ventilation by compressing on the lungs. As the rumen enlarges and compresses on the diaphragm, breathing becomes more labored. Open-mouth breathing and collapse leading to death may occur within a few minutes if the animal becomes frantic from the abdominal pain and problem breathing.

Cattle that die of most causes will bloat with free gas after death. Therefore, an animal found dead with bloat is not diagnostic of bloat.

Treatment

Bloated cattle should not be removed from legumes at the first sign of bloat. Cattle can adjust to the pasture. Only remove the ones in obvious distress who require treatment. The risk of bloat is substantially lower when cattle graze alfalfa continuously than when grazing is interrupted and cattle are allowed to graze for only 6 hours daily (Table 1).

Table 1. Effect of feeding on the incidence of bloat in cattle grazing alfalfa ¹		
	Grazing System	
	Continuous	Graze 6 hours per day
	----- Number of cases -----	
Week 1	1	25
Week 2	4	16
Total	5	41

¹ J. Anim. Sci. 1995. 73:1493-1498

With frothy bloat, the stability of the foam must be reduced before the gas can be removed. Anti-foaming agents such as Bloat-Pac® or Bloat Treatment® (DSS, dioctyl sodium sulfosuccinate) can be used as a drench or via a 3/4 inch to 1-inch stomach tube passed into the rumen. If no product is available, one may drench with 1 ounce (30 ml) of a non-toxic household dish detergent liquid in 1 liter of water. Any vegetable oil is also useful in reducing the foam. Turpentine is an old treatment that is reasonably effective but is highly irritating to the tissues and also imparts undesirable flavors to meat and milk.

As a last resort in emergencies, pending the arrival of the veterinarian, relief can be obtained by making a hole in the rumen large enough to release the foam. The incision should be made on the left side, halfway between the last rib and the hook bone/hipbone. A trochar with cannula, or knife can be used. The incision will need to be sutured, and antibiotics must be administered.

Prevention

A very effective method of bloat prevention is to provide molasses-mineral blocks or pre-mix containing Bloat Guard® (poloxalene), which is a detergent-type compound that reduces development of stable foam in the rumen (Table 2). Although

blocks are relatively expensive, any of these compounds will eliminate bloat and prevent animal deaths if consumed at the appropriate dose when grazing high risk pastures. Generally, bloat control is needed in the early spring and not necessary once the grazing season progresses.

Feeding an ionophore can also reduce the potential for bloat. Monensin (Rumensin®) can greatly reduce incidence and severity of pasture bloat but it will not eliminate the problem (Table 2). Some animals do not respond as well as others. Lasolacid (Bovatec®) does not have a beneficial effect in pasture bloat reduction; Bovatec® does have a significant effect in grain bloat reduction. Monensin inhibits rumen protozoa that normally produce gas and protein foam-stabilizing substances, thus leading to a reduction in the bloat potential. To be effective, these materials must be consumed by the animal the same day that the bloat-causing pasture is grazed and started just prior to bloat season in order to acclimatize the microbial population.

Table 2. Effect of feeding Monensin, Lasalacid, or Poloxalene on Alfalfa Pasture Bloat ¹		
Grazing System Treatment Product	Dose, mg/lb body weight	% Reduction in Bloat
Monensin ^a	0.3	71
	0.6	72
Lasolacid ^a	0.3	30
	0.6	16
Monensin ^b	0.3	41
	0.45	73
Lasolacid ^b	0.3	25
	0.45	12
Poloxalene ^{a,b}	20	100

¹ * J. Anim. Sci. 1983. 56:1400-1406

^b J. Anim. Sci. 1986. 63:1246-1257

Management practices that can help to prevent bloat:

- ▶ **Avoid first grazing in early morning.**
- ▶ **Once cattle are turned onto pasture, do NOT remove them at the first signs of bloat. Mild subacute bloat cases occur frequently on alfalfa pasture, unless a bloat preventive is fed.**
- ▶ **Provide a grass-legume mixture for pasture.**
- ▶ **Feed grain of a grain-roughage mixture to reduce pasture intake.**
- ▶ **Concentrate on making hay from high risk pastures and utilize safer fields for grazing during the early spring.**