Feedlot or Grain Bloat

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Take Home Message

✔ Feedlot, or grain, bloat occurs in cattle on a high grain, low roughage diet.

✔ Digestion of finely ground grain can cause frothy, viscous rumen contents, which in turn prevents the normal release of fermentation gas when the animal burps.

✔ This can then result in bloat in the animal.

✔ By controlling the processing of the grain in the feedlot ration, the producer can attempt to minimize the number of bloat incidents in the feedlot.

Introduction

Feedlot bloat occurs during the finishing phase of cattle feeding when cattle receive a high-concentrate, low-roughage diet. Another term to describe the condition is grain bloat. The rumen contents are viscous and frothy, which impairs the normal eructation mechanism and release of gas from the rumen (1).

Bloat in feedlot cattle can have direct economic impact. It is a major cause of sudden death in feedlots. In order to maximize gains, cattle are put onto a high grain ration as soon as possible. Processing of the grain to maximize its digestibility can also increase the potential for bloat to occur (2).

Background

Digestion of feed begins with the addition of saliva when an animal is chewing. After swallowing, the feed is moved down through the esophagus into the rumen, the largest of the forestomachs. During digestion, microorganisms present in the rumen, such as bacteria, fungi, and protozoa, begin to digest the feed materials. The gas produced from this process is expelled from the rumen by eructation; i.e. burping. When free gas is detected around the esophageal opening in the rumen, the opening relaxes allowing the gas to move up the esophagus and be expelled. This process normally occurs about once per minute.
An animal will bloat when eructation does not occur, and large amounts of gas accumulate in the rumen. In feedlot bloat, the froth or foam of the rumen contents covers the esophageal opening so that eructation cannot occur. The gas remains trapped in the froth.

### Cause

Excessive frothing of the rumen contents causes feedlot bloat. This frothiness is primarily of microbial origin, and the slime produced by these bacteria further stabilizes the froth. The grain in the feedlot ration provides a source of readily digested material for the rumen bacteria. The bacteria secrete slime and release polysaccharides (complex carbohydrates) when they rupture. The slime and polysaccharides increase the viscosity of the rumen fluid. Gas bubbles from fermentation become trapped in the rumen fluid, creating froth.

Bloat is more likely to occur in feedlots when the grain component of the diet is finely ground. The grain is then more accessible to the rumen bacteria and more readily digestible; and thus, slime and gas production is increased. The fine grain particles further add to the viscosity of the rumen fluid.

Bartley et al. (1) refer to feedlot cattle probably existing in a quasi-bloat state most of the time. Any upset in the balance that exists in the rumen could cause bloat. These upsets could result from changes in feeding patterns, weather, feed delivery time, or other management factors.

Although feed and microbial factors are the primary causes of feedlot bloat, animal differences may contribute to the incidence of bloat. It is generally accepted that susceptibility to pasture or legume bloat is inheritable. However, the animal factors in feedlot bloat have not been well defined (1, 4).

### Clinical Signs and Treatment

A bloated animal will show distension of the left flank, but the entire abdomen can become enlarged. The animal is in obvious discomfort it may kick at its belly; lie down and get up frequently; pass manure frequently; and as the bloat progresses, breathing becomes more difficult. Feedlot cattle are often found dead because they are not observed repeatedly throughout the day.
Treatment of an individual animal varies depending on the severity of the bloat. Mild distension of the rumen may be relieved by walking the animal until eructation occurs. Mild to moderate distension may be relieved by passage of a stomach tube into the rumen to allow the release of any gas pockets and to administer an antifoaming agent. Examples of antifoaming agents are mineral oil, an emulsified oil, or dioctyl sodium sulfosuccinate. In life threatening situations, it may be necessary to use a trocar and cannula to puncture the distended flank through to the rumen to relieve pressure. Antifoaming agents can then be administered through the cannula.

Prevention

Feedlot bloat can be prevented by controlling the particle size of the grain in the ration. If the grain is ground too fine, the rumen bacteria have a readily available surface for digestion and rapid proliferation. A coarse particle size reduces the surface available to the rumen microorganisms, thus it slows the digestion process. As well, feed intake is greater and more constant. Hironaka et al. (2) found that fine particle size feed (388µ) caused foamy rumen contents compared to a coarse particle size feed (715µ) when fed to cows.

Feed additives, such as monensin or lasalocid (5) may reduce the incidence of bloat in cattle on high grain rations. Adding 4 percent salt, (NaCl) (6) to the diet may control bloat by increasing water intake and diluting the rumen contents. However, this is not a long-term solution; salt also reduces feed intake.

Conclusion

In summary, feedlot bloat occurs in cattle on a high-grain, low-roughage diet. Finely ground grain provides ready access to rumen bacteria for digestion. The bacteria produce a slime; and when the bacterial cells rupture, polysaccharides are released. These two factors increase the viscosity of the rumen fluid. The gases that are normally produced during fermentation of the feedstuffs then become entrapped in this viscous fluid, forming a froth. The small particulate matter from the ground grain adds to the frothiness of the rumen contents. Eructation of the gases is impaired, and bloat can result. Feeding coarsely processed grain can help to alleviate the problem of feedlot bloat.
References


