K-STATE Kansas State University Research and Extension

FORAGE FACTS

Publication Series

FOAMY PASTURE BLOAT

INTRODUCTION

An important factor affecting animal performance of cattle grazing high-quality legume and cereal grain pastures is frothy bloat. Bloat can have potentially devastating effects on animal health, if cattle are not monitored closely, especially when cattle are first introduced to bloat-susceptible pastures and/or during certain climatic conditions and plant growth stages when the nutrient composition of the grazed forage changes rapidly. For example, average death losses attributed to wheat pasture bloat have been estimated at 2 to 3 percent, but can occasionally reach 20 percent. In addition to increased death loss, other consequences of bloat that reduce profitability of grazing enterprises include reduced weight gains, lower milk production, reduced feed efficiency, increased labor costs and added treatment costs. Understanding the causes of bloat and using practices that reduce and/or prevent pasture bloat will help to reduce losses and improve performance of cattle grazing lush forages.

DEFINITION

Foamy bloat occurs when cattle consume feeds that are readily digestible, such as finely ground grains and high-quality alfalfas, clovers and cereal grain forages. Once consumed, these feeds provide readily available nutrients that are immediately utilized by ruminal microbes, leading to a very rapid production of gas in the rumen. In the case of foamy, or frothy bloat, these gasses are then "trapped" in a thick, proteinaceous foam. The presence of the thick foam prevents the animal from expelling the gas, leading to excessive pressure and creating the characteristic distended abdomen. If severe cases are left untreated, pressure can continue to build, resulting in severe discomfort and eventual death.

CAUSES OF BLOAT

Bloat is thought to occur when highly digestible feeds are degraded and fermented rapidly. Rapid fermentation can occur when rapidly growing, succulent forages are consumed. This includes alfalfas and clovers grazed during the pre-bloom and early-bloom stages and cool-season annual and perennial forages during periods of rapid growth. Factors influencing the incidence of frothy bloat in grazing animals can be categorized into three areas: animal, plant and ruminal factors.

Animal Factors. Variation in incidence and severity of bloat between animals grazing the same pasture may be partially related to animal factors such as differences in diet selection, forage intake and saliva production. Increased saliva production may reduce formation and stability of frothy bloat through its potential anti-foaming characteristics, buffering capabilities and effects on rate of passage. Animals highly susceptible to bloat may secrete less saliva and/or have unique ruminal populations of bacteria and protozoa compared with less susceptible animals. Although forage intake would appear to affect an animal's susceptibility to wheat pasture bloat, research remains unclear on the role of forage intake patterns on occurrence of bloat.

Plant factors. In general, bloat provocative forages are actively growing, highly digestible species with high protein and low fiber contents. These include temperate legumes such as red clover, white clover, Persian clover and alfalfa, as well as small grains and

annual and perennial grasses such as winter wheat. Foamy bloat has been associated with increases in soluble proteins and/or carbohydrates associated with the rapidly growing forage, as well as a more rapid release of plant cell contents in the rumen that leads to a high rate of ruminal gas production. In addition to soluble proteins, mineral content of the grazed forage also has been related to metabolic disorders of animals grazing winter wheat. Research indicates that increased occurrence of bloat is associated with increases in calcium (Ca) and magnesium (Mg) concentrations of legumes, as well as increased potassium (K) and/or potassium:sodium ratios of winter wheat.

Ruminal factors. Perhaps even more important than the mineral composition of the grazed forage are the relative ratios of cations ingested by the animal and present in the rumen. While ruminal concentrations of soluble proteins and minerals may not initiate bloat, they are believed to increase the stability of foam in the rumen, potentially increasing the incidence and severity of bloat. Attraction between soluble proteins, which are negatively charged, and positively-charged mineral ions present in rumen fluid can increase the stability and strength of foams. Similar to colloidal suspensions of soils, divalent (Ca and Mg) and trivalent ions can form bonds with two or three negatively charged protein particles, thereby creating a more stable foam compared with sodium, a monovalent ion. Several trials evaluating legume bloat indicated that ruminal Ca, Mg and K concentrations were significantly higher and Na levels significantly lower in bloating animals, suggesting Na supplementation may reduce the incidence of bloat. Additional wheat pasture bloat research also indicates an increase in occurrence of bloat concurrent with increases in forage potassium levels.

PREVENTION OF BLOAT

Cattle and pasture management, as well as the use of surfactants and additives will help to reduce the incidence of pasture bloat. Occurrence of bloat is affected by a combination of climatic conditions, soil fertility, forage maturity and grazing management factors. Reducing the incidence of bloat may require changes in several management practices, as well as close management of grazing animals.

Grazing Management. Possible pasture management techniques include managing interseeded, or "mixed" pastures to maintain no more than 50 percent alfalfa or clover, and selecting alfalfa and clover varieties with less potential for causing bloat.

Cattle Management. Fill cattle on dry roughage before introducing them to bloat-susceptible pastures. If possible, delay initial turnout until midday, when pastures are dry. Where facilities and labor management permit, identify animals with greater susceptibility to bloat and manage them separately.

Use of Surfactants. Surfactants, or anti-foaming agents, have been used successfully in some grazing situations. Spraying surfactants on bloat-provoking pastures when conditions are conducive to bloating works well, especially in highly controlled grazing systems with small paddocks. An alternative to pasture spraying is to add the agent to drinking water; however, addition to drinking water may be less effective because of variation in water consumption.

Poloxalene. Several studies indicate that feeding poloxalene (Bloat Guard) at levels of 1 to 2 grams/100 pounds of body weight per day dramatically reduces bloat. Poloxalene is a mild detergent that reduces the surface tension of the foam, resulting in decreased formation of foam and release of gasses entrapped in the foam. There are several products available for use in grazing programs, including mineral supplements, blocks, liquid feeds and top dresses. It is important to remember that in order to be effective, adequate amounts of poloxalene must be consumed on a regular basis. Guaranteed consumption of a sufficient amount of poloxalene may mean hand-feeding 1 to 2 pounds of a highly palatable supplement containing poloxalene each day.

Ionophores. Although not as effective as poloxalene, Rumensin and Bovatec have been shown to reduce the incidence and severity of frothy bloat while also improving animal performance. Research with winter wheat pasture indicates that ionophores may reduce the incidence of bloat by reducing the amount of gas produced by microbes in the rumen. Ionophores work well when included in supplementation programs, providing a level of bloat protection while improving daily gains throughout the grazing season.

SUMMARY

The occurrence of frothy bloat in grazing livestock is initiated primarily by a rapid release of plant cell contents that are quickly degraded and fermented in the rumen. The gasses produced in the rumen are then trapped in a thick foam that prevents the animal from expelling the produced gasses. While actual death loss due to bloat may be small, subclinical bloat can reduce animal performance and increase labor and medical costs. Evaluating your pasture management techniques, watching cattle closely, and providing bloat-reducing products can reduce the occurrence of bloat and improve animal performance when grazing lush, high-quality forages.

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