Strategies to Beat Grain Pasture Bloat

As feedlot costs rise and more beef producers turn to the alternative of grazing cattle on small grains, experts warn of more pasture bloat.

by ***Ed Haag***

It comes as no surprise to savvy beef producers that soaring feedlot costs — more than 70¢ per pound (lb.) of gain — will translate into lower weaned calf prices and higher prices paid for finished animals.

"In every situation like this we have winners and losers," says Terry Klopfenstein, University of Nebraska animal scientist, noting that the winners among cow-calf operators will be those who have the resources to put more weight on their animals before letting them go.

Historically, one of the most cost-effective ways of adding weight to calves is by grazing them on young cereal-grain stands. Grains grazed in fall and early spring — like winter wheat, oats, rye, triticale and barley — offer palatable, nutritious forage at a cost less than $1 per day per animal. Studies show gains of approximately 2 lb. per animal per day can be expected from a calf, heifer or steer in average condition.

Bill Pinchak, beef cattle nutritionist at the Texas Agricultural Experiment Station in Vernon, is well aware of the benefits of grazing cereal grains, but he also warns of the risks associated with the practice. "Where you have cattle grazing winter wheat pastures you will see a higher incidence of pasture or frothy bloat," he says.

In the Southern Great Plains of Texas, where the practice is common, Pinchak estimates cattle losses attributed directly to pasture bloat are $24 million a year. "Wheat pasture bloat is the major nonpathogenic cause of death in the Texas stocker cattle industry," he says. It accounts for a 1%-3% death loss in cattle grazing winter wheat pastures.

A publication produced by the Kansas Forage Task Force estimates death losses attributed to wheat pasture bloat in Kansas — another cereal-grazing state — run 2%-3%, but occasionally reach 20%.

The publication also points out death loss is just one of the negative implications of bloat. Bloat can also be responsible for reduced weight gains, lower milk production, reduced feed efficiency, increased labor costs and added treatment costs.

Understand the problem

While frothy bloat can be economically devastating to the unprepared beef producer, understanding what it is and how it works is the first step to preventing, or, at the very least, limiting its effect, Pinchak says.

He is currently leading a team of Texas researchers whose goals are to identify the mechanisms responsible for frothy bloat and to cut cattle losses caused by the disorder in half by 2009. "It should be understood that wheat pasture bloat appears to be a multidimensional complex that varies across the grazing season," Pinchak says. "It is likely to appear only at certain times."

To understand when and why bloat occurs, it is necessary to be acquainted with rumen function, Pinchak says.

►**Above and left:** The lush grazing that cattle find on grain pastures could cause deadly bloat under certain conditions.

In a normally functioning rumen, a population of bacteria, fungi and protozoa, located in the forestomach, help the animal assimilate fibrous feed such as grasses by predigesting this material. In the process, these microorganisms produce large quantities of gas that must be expelled.

In a non-bloat situation, the gas produced in the rumen separates from the solid and liquid contents and then rises to the top of the rumen, where it collects as a large bubble. When the gas pressure in the rumen reaches a certain level, receptors in the esophagus area sense the presence of gas in the rumen. The esophagus then relaxes as the animal takes a deep breath, drawing the gas up the esophagus. Much of the gas enters the lungs with the remainder being expelled through the mouth.

Before this action can take place, another set of receptors in the walls of the rumen sense whether the pressure is actually caused by a free gas. If it is caused by a liquid or foam, the esophagus will remain closed, and the belch will not occur. Researchers surmise this mechanism is present to prevent fluid or foam from accidentally entering the lungs causing aspiration pneumonia.

In a situation where frothy bloat occurs, normal burping patterns are disrupted due to the formation of a foamy bloat matrix caused by rumen bacteria producing a low-gas-permeable biofilm. This biofilm forms a matrix of forage particles comprised of polysaccharides and bubbles of fermentation gas that inhibit normal belching.

This emulsion eventually fills the rumen and is detected by receptors in the rumen wall. Because they detect an emulsion and not a gas, the esophagus remains closed, preventing the animal from releasing the gas trapped in its rumen.

"In severe cases, animals can die from cardiac or pulmonary arrest associated with excessive pressure in the rumen," Pinchak says, noting some animals exhibiting mild bloat do not migrate to more severe forms.

Bloat does not discriminate

Unlike grass tetany, another digestive disorder associated with grazing, bloat does not confine its damage to lactating cows. "Anything that is weaned, whether it is 250 pounds or 800 pounds, has the potential of coming down with bloat," Pinchak says. "Bloat does not discriminate."

While all grazing cattle are susceptible to bloat, the disorder is more likely to occur at specific times depending on the grazed plant's development. "Bloat occurs most often when wheat is at its rapid growth stage," Pinchak says. "If you have really lush, aggressively growing small-grain forage, you are more likely to see bloat. We are talking about standing crops of 1,000 to 3,000 pounds per acre."

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— Bill Pinchak

He adds it can occur in the fall and it can most certainly occur in the spring after the plants come out of dormancy and are actively trying to grow. Conversely, bloat rarely occurs in the dead of winter, Pinchak says.

Other common factors relating to the incidence of bloat are the amount of forage available, the level of nitrogen applied to the crop, and the grazing behavior of cattle. "The more forage available to the animal, the more bloat we will see," he says, adding that the same dynamics apply to pre-plant fertilization. "The higher the nitrogen levels, the more bloat we will see."

Pinchak notes one unique phenomenon he and fellow researchers Dariusz Malinowski and Byeng Min have observed is the relationship between changes in sunlight intensity and outbreaks of bloat.

"If you have several days of relatively intense sunlight, followed by a period that is overcast, then the likelihood of bloat increases dramatically," he says, adding that while research into this relationship is in the early stages, he and his colleagues believe a substance produced by the plant to protect itself from solar radiation also functions as a buffering agent inhibiting the development of bloat.

An ounce of prevention

For Pinchak, probably one of the most important actions a beef producer can take to reduce the risk of a serious bloat problem in his cattle is to familiarize his animals with products that are normally used to control the disorder.

"What I tell beef producers to do is pre-expose any cattle going onto small-grains pasture to everything they are expected to consume throughout the time period they will be grazing," he says. "That would include surfactants and ionophores if that is what you are going to use to control bloat."

Animals not already familiar with products used to control bloat are less likely to consume them when they are already suffering from the disorder, the Texas nutritionist says. "I don't care how good a product is, if they won't ingest it, it just isn't going to work."

He notes the most commonly used bloat preventative is poloxalene. This anti-foaming agent is available in premixes and in poloxalene-molasses-salt blocks. It is recommended cattle consume the supplement for at least three days before being turned onto small-grain pasture.

For those who want to combine bloat prevention with feed efficiency, Pinchak recommends using an ionophore such as Rumensin® or Bovatec.® "The added benefit of an ionophore is that you are going to get

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some bloat protection and you are also going to improve your daily gain," he says.

One frothy bloat control strategy that doesn't cost extra involves reducing the availability of the forage to each animal when there is a risk of bloat by increasing the stocking rate. "For example, in the fall and winter you might allocate 2.5 acres for every 500 pounds of calf," Pinchak says. "Then you would double or even triple that rate in the spring when the plants start to actively grow."

Detecting bloat

Pinchak notes the early stages of bloat are often difficult to spot by observing an animal's behavior. Cattle continue to eat and act normally in most cases. In many cases it is only possible to detect early bloat by using a three-point visual scoring system developed by researchers at Oklahoma State University (see Fig. 1).

While 0 represents no bloat — visually detected or otherwise — bloat score 1 represents mild bloat. In this stage, the animal's left dorsal region of the rumen is slightly to moderately distended.

In bloat score 2, which represents moderate bloat, the animal's left dorsal region of the rumen is severely distended. At this stage the animal often appears uncomfortable.

Finally, in bloat score 3, which represents severe bloat, not only is the left dorsal region of the rumen severely distended, but the condition starts to express itself ventrally on the right side. "This is the stage where you start to see animals die," Pinchak says. "Cattle that get to this point are at severe risk."

When an animal reaches a bloat score of 3, Pinchak suggests, immediately pull it from the herd, isolate it for observation, put it on dry feed and contact a veterinarian for recommendations on additional treatment.

Fig. 1: Visual illustration of bloat