Dr. Colin Palmer

Biography:
Dr. Colin Palmer is an Associate Professor of Theriogenology (Animal Reproduction) at the Western College of Veterinary Medicine. Originally from Nova Scotia, Dr. Palmer worked in mixed practices in Ontario and British Columbia and has owned/operated a practice in Saskatchewan. Dr. Palmer along with his wife Kim and children Lauren, Emily and Carter run a herd of purebred Red Angus cattle under the KC Cattle Co. name.

A Breeder's... Veterinary Perspective

The Whys and Hows of Bloat in Fed Cattle

As we move into fall it soon becomes time to put our calves on a winter feeding program. Usually, few digestive issues occur as they begin to feed on good quality hay bales and it is pleasing to watch their intake improve. Watching livestock feed is a tranquil experience for most of us, but pleasant feelings quickly disappear with the first sight of a bloated calf.

When I was in veterinary college I learned that there were few real emergencies involving cattle - bloat is one of them! Hardly a new disease, "bloat," or an alias, has appeared in the literature for nearly 2000 years. Despite not being able to completely prevent its occurrence, our understanding has improved substantially over the last 2 or 3 decades. In my opinion, the best and most comprehensive article on bloat ever written is available on line from the Province of Alberta, Agriculture and Rural Development web pages at http://www1.agric.gov.ab.ca . Authored by several noteworthy Canadian scientists it is called Bloat in Cattle. Although it is oriented towards typical cattle management situations prevalent in western Canada, it should appeal to all who feed cattle. Check it out!

Micro-organisms present in the forestomach of cattle are necessary for digesting fibre with gas being a natural by-product. As much as 2 L of gas per minute can be produced by steers consuming alfalfa which under normal conditions rises to the top of the rumen facilitated by normal rumen contractions that occur at the rate of 1 to 3 per minute. Gas accumulation is sensed by nerves in the rumen wall and pressure is relieved by a relaxation of muscles controlling the opening to the esophagus enabling belching to occur. Cattle belch at a rate of 1 to 4 times minute per minute which largely goes unnoticed unless a large amount of gas is being vented. Gas production and the belching frequency peak about 2 to 4 hours after feeding; if the esophagus is unable to sense gas build up or is obstructed, bloat can occur very rapidly.
Bloat has two clinical presentations – free-gas and frothy. Free-gas as the name implies is simply a large pocket of gas that is unable to escape the rumen. When the pocket is tapped, smelly gas escapes as rapidly as that of a punctured tire.
Free-gas bloat accounts for about 1 in 10 bloats and has been associated with irregular feeding, damage to the nerves in the rumen wall and obstruction of the esophagus with feed. Potatoes, apples and other fruits and vegetables that can be consumed whole are common causes of esophageal obstruction. Weather changes, feed quality variations, inconsistent feeding intervals, and sickness are common predisposing factors. Rumen acidosis associated with mild grain overload can impair rumen movement and lead to free-gas bloat. Limited or irregular access to salt and water can also affect rumen function. Cattle that have had severe pneumonia or hardware disease are at a higher risk of bloat and are more likely to become chronic bloaters because of permanent damage to the nerves controlling the rumen.

Frothy bloat has long been associated with grazing legume pastures. It was believed that proteins in the alfalfa or clover were responsible for producing foam which then trapped the rumen gas and prevented it from being belched. However, frothy bloat can be associated with feeding grain, winter wheat pasture, and pelleted feed. The current belief is that two factors set the stage for the occurrence of frothy bloat – rapidly digested feedstuff and small particles in the rumen. These precipitate an overgrowth of rumen

bacteria responsible for producing a slimy, viscous fluid that subsequently traps rumen gas. Alfalfa hay that is very leafy and has fine stems, or lots of fine particles and leaves remaining at the bottom of the bale feeder has a high bloat risk. Damp, moldy hay appears to more dangerous than dry hay, whereas silage and haylage are low-risk feeds. The combination of alfalfa hay and grain feeding is the number one cause of dry-feed bloat. It is believed that the combination of fine feed particles and rapidly digestible nutrients create a "perfect storm scenario" for rumen bacterial proliferation. Adding molasses or other rapidly digestible sugars increases the risk.

I have always preferred to focus on prevention rather than treatment. Alfalfa hay should be introduced to calves slowly with careful observation. The highest occurrence of bloat in cattle grazing alfalfa pasture was within 2 to 4 days of introduction. In contrast, animals consuming a mostly grain diet have a greater tendency to bloat about 2 weeks after feed introduction. New batches of alfalfa hay should be introduced slowly and cattle should be fed consistently; don't let them run out of feed. If you are processing your own grain on farm extra care is warranted as variable amounts of fine particle-sized feed can occur even when grain is dry-rolled despite attempts to produce a coarsely ground product. Steam rolling or increasing the moisture content of the grain before rolling is better. Failing that, mixing the feed really well to evenly distribute the fines and adding salt to the diet (4%) to increase water intake may be helpful. Incorporating monensin (Rumensin®) into the diet can substantially reduce the occurrence of both grain and alfalfa pasture bloat. Research has shown that feeding additional calcium is not useful nor is feeding laundry detergent. Household products may also contain chemicals that cause permanent damage to the rumen.

Even with the very best feed management, the occurrence of at least an occasional bloat in fed cattle is inevitable. In severe cases, cattle may die within 2 to 4 hours of onset as a result of compression of the diaphragm and lungs causing suffocation. Penetrating the distended rumen with a knife, trocar or hypodermic needle should be reserved for only those cases where death is imminent. A more favourable and far less traumatic method of relieving pressure is to pass a stomach tube. Learning to pass a stomach tube in calves and adult cattle is a must for every cattle person and is perhaps something we should be teaching 4-Hers how to do – "First Aid for Cattle." With free gas bloat, the gas release is instantaneous requiring about a minute to be completely expelled. If the esophagus is plugged the tube may also be used to clear it. Passing the tube into the rumen of animal with frothy bloat is far less dramatic as most of the gas is unable to escape the foam. Nevertheless, the stomach tube is the best way to administer anti-foaming agents. I generally keep a few bottles of anti-bloat emulsion around containing dioctyl sodium sulfosuccinate which disperses the foam and mixes well with rumen contents. Non-toxic oils like mineral oil (300-500 mL per 1000 lbs) are a second choice. Most animals will belch within several minutes of treatment and walking them will be helpful. Some animals may require a second tubing to relieve gas that has been released from the foam.