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## Bloat – A Medical Emergency!

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When you've got a cow with a distended abdomen, think of the five F's first – feed, fat, fluid, flatus (GAS!), and one that's near and dear to my heart recently, fetus! Bloat is the condition in which the rumen is distended with gas. Unlike the other causes of a big belly, bloat is a true emergency in cattle. As the rumen distends, it puts pressure on the diaphragm, making it difficult for the lungs to expand. Ultimately, cows can die from asphyxiation if left untreated.

How do you know you've got a bloated cow? Most times it is fairly obvious. When looking at the back end of the cow, the abdomen will be protruding on the entire left side and sometimes the lower right side of the cow. When you press on it, it will feel like an inflated balloon and you can often hear a very loud pinging sound over the entire left side of the cow. If you exam her rectally, you will feel that same inflated balloon on the left side of her abdomen. In extreme cases, you may notice that the cow is breathing fast or heavy.

A bit of anatomy and physiology helps explain where gas comes from and ends up in a normal cow. The rumen is a vat of microbes that create a wide array of gasses as a part of their normal metabolism. The bugs live in the liquid portion of the ruminal contents and the gas normally moves above the fiber mat to float as a free layer (the gas cap). As the rumen contracts, some of this gas passes further down the digestive tract, ultimately voided from the back end of the cow. The rest is pushed against the "inside" end of the esophagus, triggering the cow to eructate or burp. In all cases, the first step in treatment is relieving the bloat, usually by passing a tube down the cow's esophagus into the rumen. When the animal is more comfortable, we can do a thorough examination and determine the cause of the bloat.

### Top 5 Causes for Bloat (in no particular order):

1. **Hypocalcemia (Low Blood Calcium):** Calcium is a critical component in all muscle contractions. Without it, rumen contractions slow or stop, and gas builds up. Treating the low blood calcium with IV, subcutaneous or oral therapy will restore regular rumen contractions and cure the bloat.
2. **Frothy Bloat:** Frothy bloat occurs when the gas produced by the microbes doesn't move up above the fiber mat, but rather is retained within the liquid portion. The lack of a good gas cap prevents the normal eructation process, so the gas can't escape through the throat. Frothy bloat most commonly coincides with significant consumption of rich leguminous pasture or green chop (for example lush clover pastures in spring). In this case, the bloat will not be relieved by passing a tube as there is no gas cap to remove. A surfactant can be drenched into the rumen that breaks up the gas bubbles and allows it to come out of solution (much like defoamers used in boiling maple sap), recreating the gas cap that can be eructated by the cow. Treatment is effective usually in minutes. This cause can be prevented by slow introduction to fresh pasture in the spring or mixing green chop with more fermented feeds.
3. **Ruminal Acidosis (Grain Overload):** Consumption of a large quantity of carbohydrates drives the pH of the rumen down, changing the population of microbes living in the rumen. The acid

preferring bacteria make more volatile fatty acids (VFA) than the “normal” mix of bugs. Chemical sensors in the walls of the rumen detect this increase in VFA’s as “fullness” which reflexively slow rumen contractions, allowing gas to build up. Treatment of ruminal acidosis depends on its severity and duration and is beyond the scope of this article, but typically presents with a host of other signs as well.

4. **Choke:** Choke is the term used for obstruction of the esophagus. As noted, much of the gas in the rumen escapes via this route. Physical obstruction in cattle is typically caused by one single, solid object, commonly an apple or piece of corn cob. Often the object can be dislodged into the rumen when the large bore tube is passed down her throat. Removal of the object resolves the bloat.
5. **Positional:** Positional bloat occurs in down cows that are in unusual positions, for example a milk fever cow flat out on her side for a long period of time or one caught in a stall in a strange position – basically any position that prevents the gas cap from coming into contact with the tail end of the esophagus. Without the normal trigger for eructation, gas builds up in the rumen. Treatment involves righting the cow to a normal position, either on her brisket or standing, so normal eructation can occur.

If we think of the commonalities of these five causes of bloat, we see that anything that prevents the rumen from contracting or the passage of gas through the digestive system (upstream or down!) can result in bloat. Along that line, less common causes for bloat include: tetanus, pneumonia (especially in calves), or hardware disease (all from decreased rumen contractions) and cancer, RDAs, or intestinal torsions (physical obstruction of gas flow).



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