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Ruminal Tympany

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Ruminal tympany or bloat is a ruminal dysfunction that results from the accumulation of excessive gases of fermentation within the rumen. Bloat occurs when the eructation mechanism is impaired or inhibited and the rate of gas production exceeds the animal's ability to expel the gas

Pathophysiology:

Gases are produced in the rumen as normal by-products of microbial fermentation. Normally, the majority of fermentation gases are eliminated from the rumen *via* eructation. Eructation is a complex series of muscular contractions in which gas is forced from the rumen through the cardia and is released through the oesophagus.

The eructation sequence is initiated by the presence of free gas in the dorsal sac of the rumen. Thus, if ruminal conditions prevent normal contractions from occurring in the reticulorumen or if movement of free gas through the cardia or oesophagus is obstructed, bloat occurs **(Clarke and Reid, 1974)**. As gas accumulates, the expanding rumen exerts pressure on the diaphragm and lungs, impairs respiration, and ultimately leads to death.

Etiology and Types of bloat

Bloat is caused by several factors and interactions involving management, feed and microbial factors.

Two different kinds of bloat can be observed in animals

1. **Frothy bloat or primary bloat:** The gas remains trapped in the rumen fluid, forming an emulsion of small bubbles about 1mm in diameter. The frothy rumen contents expand, filling the rumen cavity and inhibiting the nerve endings that control the opening into the oesophagus.

Causes of frothy bloat: A frothy bloat may occur when a high concentrate, low roughage ration is fed. Cattle fed with high quantities of Legume pastures feed/ pasture legume causes acute and frothy form of bloat due to the Soluble leaf proteins, saponins and hemicelluloses are believed to be the primary foaming agents and has its greatest stability at about pH 6.0. Salivary mucin is antifoaming, but saliva production is reduced with succulent forages. Frequency of bloat is greatest during the pre-bloom stage of growth. Cool nights, which may result in heavy dew, are frequently associated with severe outbreaks of bloat.

2. **Free gas bloat or secondary bloat** caused by diets that lead to excessive gas production and concomitant low intraruminal pH. Oesophageal obstruction, esophagitis, ruminal acidosis, rumenitis, overfill, and ruminal atony, each of which can interfere with eructation and cause secondary ruminal tympany and free-gas bloat. When bloating occurs, these gases cannot escape, and they continue to build up and cause severe distension of the abdomen, compression of the heart and lungs, and eventually death.

Clinical findings

Distension is usually more obvious in the upper left flank, although the whole of the rumen can be enlarged. The animal is uncomfortable and may get up and lie down frequently, defecate often, kick at the belly, and roll over in attempting to relieve the discomfort. Breathing is difficult or laboured (a condition known as dyspnea) and grunting are marked and are accompanied by mouth breathing. The animal protrudes the tongue, salivates, and extension of the head and frequent urination. Occasionally, projectile vomiting occurs, and the animal may expel soft faeces in a stream. In advanced cases the animal will go down and unable to rise up. Death is rapid at this stage, and due to the swollen rumen compressing the lungs, interfering with breathing and tissue oxygenation, and obstructing blood flow.

Treatment:

- Animals that are mildly affected can be treated orally with an anti-bloat preparation. After dosing, keep the animal moving to encourage the preparation to mix with the frothy rumen contents
- A stomach tube can be used to relieve the gas build-up in bloated animals. Anti-foaming agents can be delivered directly into the rumen through the tube. Moving the animal around after treatment is important
- Remove animals from bloating pasture.
- In severe cases, emergency rumenotomy.

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- In mildly affected cases, passage of stomach tube or trocarisation with trocar and cannula (2.5-cm diameter into left paralumbar fossa) to release rumen foam and gases or Anti-foaming agents can be delivered directly into the rumen through the tube.
- Antifoaming agents (eg: mineral and vegetable oil) into rumen directly by stomach tube or from trocalization canula or orally by drench the agent after dissolved with water or mineral oil, followed by walking for 20 minutes to disperse antifoaming agent, in primary bloat to decrease the surface tension of gas bubbles leading to explosive and gas free from its bubble and accumulation in upper part of rumen to allow eructation.

Prevention:

- Feed total mixed rations containing coarsely chopped roughage and grain to increase the dry matter content of the feed.
- Feed forage supplements before grazing.
- Strategically use of antifoaming agents to pastured cattle.
- Avoid grazing of cattle on legumes before they begin to bloom.
- Sustained-release antifoaming agent's administration such as monensin.
- Avoid turning of animals onto fresh high bloat-potential pasture, which is moist with dew, rain or irrigation water.

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