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Ruminal Acidosis in Cattle

Acute ruminal acidosis is a common metabolic disease of cattle and usually results from a sudden ingestion of feed sources that are rich in highly fermentable carbohydrates (such as grains (Risk = Wheat > triticale > barley > oats > sorghum > maize), concentrate feeds, root crops, fruits or by-products like bread and bakery waste. These products are fermented in the rumen by bacteria to produce volatile fatty acids (VFA's) and lactic acid. This results in a drop in rumen pH below 5.0 (normal rumen pH is 6.5 to 7.0). When this happens, acid-producing bacteria in the rumen continue to produce acids further reducing the rumen pH, the rumen stops contracting, the rumen wall gets chemically damaged, the blood pH becomes acidic (metabolic acidosis), and the animal becomes dehydrated. In severe cases the affected animals will die. Acute ruminal acidosis can occur 8 to 24 hours after access to the highly fermentable carbohydrate source.

There is a less severe form of ruminal acidosis that is called subacute ruminal acidosis (SARA). This occurs when there is a slight drop in rumen pH (but remains between 5 and 5.5) from fermentation of feed and results in an accumulation of VFA's but not lactic acid in the rumen. This is more commonly seen in dairy herds.

It is important to remember that when a single animal in a group is diagnosed with ruminal acidosis, there will be a number that are subclinically affected.

Clinical signs for each of the types of ruminal acidosis are summarised in the table below:

Type of ruminal acidosis	Typical clinical signs
Acute acidosis	Sudden death Ataxia (staggering gait) Colic Grinding teeth Increased heart rate Atonic rumen (reduced absent contractions) Mild bloat Diarrhoea (bubbly light grey colour) Dehydration Down and not wanting to get up

Subacute (SARA)	<p><u>Individual animal:</u> Poor body condition score Poor rumen fill Intermittent anorexia Intermittent diarrhoea Liver abscess -> lung abscess-> bleeding from nose/mouth Lameness (laminitis)</p> <p><u>Dairy herd level issue:</u> Lowered milk fat percentage (<1.15:1 milk fat-protein ratio) Reduced chewing activity Intermittent diarrhoea High number of lame cows >30% of a herd have rumen pH samples <5.5</p>
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Treatment of acute ruminal acidosis consists of:

Mild clinical cases

- Withhold concentrates and feed hay to stimulate saliva production.
- Additionally, oral drenching with 1g/kg of sodium bicarb or 0.5-1g/kg Mag Ox as alkalizing agent, oral electrolyte.
- This treatment may need to be repeated in 6 hours
- Gradual access to water

Severe clinical cases- URGENT VETERINARY ATTENTION REQUIRED

- Some animals require their rumen to be emptied
- IV fluids (Hypertonic saline and Sodium Bicarbonate)
- Oral antacids- such as Mag Ox 1g/Kg
- Broad spectrum antibiotics
- Transfaunation (10-15L rumen fluid from a healthy cow is given to the sick cow)
- Anti-inflammatories
- Antihistamines
- Calcium supplements
- Thiamine (Vitamin B1)
- Withholding concentrates
- Offer hay only
- Gradual access to water

*Despite intensive aggressive treatment some animals will die several days later or possibly develop ill-thrift, liver abscesses, peritonitis

Management of herds with subacute acidosis (SARA) consists of:

Concentrate feeding

- Integrate concentrate feeding with forage portion of diet
- Change type of grain to one with less starch or more slowly degradable starch

- Change processing of grain from fine to coarse
- Reduce amount of grain fed
- Add buffers, neutralizing agents and rumen modifiers to the diet

Grazing management

- Ensuring grazing rotation is optimal (three leaf in autumn/winter, two leaf in spring)
- Ensure cows are eating pasture to a good residual height (5cm between clumps)
- Making sure cows have reasonable access to pasture each grazing
- Provision of even access to pasture - hold back herd until all are cows are milked or fresh break provided for later milkers

Increase effective fibre in the diet

- Provide a source of effective fibre. Straw>hay>silage. Ensure even access so that all cows can eat it.
- Try to feed the fibre source as close as possible to when grain is fed to stimulate more saliva production and buffering capacity
- Spread out feeding of 'acid dump' feeds eg. Low pH silage, over 24-hour periods.

Reference material:

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