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Milk Fever (Hypocalcaemia) in Cows

Milk fever (also known as hypocalcaemia or parturient hypocalcaemia) is a common metabolic condition affecting cows around the time of calving. In cattle the regulation of blood calcium within the body is tightly maintained by several hormones which are calcitonin, parathyroid hormone (PTH) and Vitamin D3. When the demand of calcium exceeds that of supply, the cow will experience low total blood calcium, below the normal range of 2.1-2.5mmol/L. The condition can be sub-clinical (total blood calcium 1.4-2.0 mmol/L) and clinical (total blood calcium <1.4mmol/L).

Cows that are at greater risk of developing milk fever include:

- High milk producing cows
- Cows > 4 years of age
- Channel island breeds (Jersey and Guernsey cattle)

In Australia, the incidence of clinical milk fever is low when compared to other countries (3.5%, range of 1-10%). The incidence can vary greatly between farms (<1% to >25%). Approximately 75% of cases occur in the first 24 hours of calving. Some studies have shown that a clinical case rate of 5% in the herd is associated with a subclinical rate of 33%.

Cows that have had milk fever produce an average of 14% less in that lactation and have 3 times the risk of increased calving time and difficulties, RFM's, LDA's. They also have 9 times the risk of mastitis and ketosis and an increased risk of a prolapsed uterus, and of being culled from the herd!

Looking at herd scenarios, if >3% of a herd required treatment for milk fever and/or cows under the age of 5 that had milk fever last year, milk fever prevention needs to be a focus for the next calving period.

The signs of milk fever are summaries in the table to the right.

For cows experiencing stage 2 and 3 milk fever, it is an **Emergency!** If the cow is laying flat out, it is best to try and sit her up to prevent her from bloating and or aspirating. You can lean her against a ATV or hay bale if needed.

Treatment involves supplying the cow with calcium. This can be given in the form of flow packs under the skin or in the vein. If given directly into the vein, they must be given slowly as too fast can result if heart arrhythmias and death.

| Stage | Clinical presentation | Blood calcium levels |
|---------|--|----------------------|
| Stage 1 | The cow may be standing or in sternal recumbency. The cow may show the following signs: anorexic, nervous excitement, tremors, hypersensitivity, muscle weakness, uncoordinated, restless and anxious, cold extremities and a mild tachycardia | 1.4-1.9mmol/L |
| Stage 2 | The cow will be down in sternal or lateral recumbency (due to flaccid paralysis with a classic 'S' shaped curvature of the neck). Other signs include: Muscle tremours, cool extremities, tachycardia with decreased cardiac sound intensity, dry eyes and pupils dilated relatively unresponsive to light, reduce body temperature, reduced rumen contraction +/- bloat | 0.9-1.6mmol/L |
| Stage 3 | The cow will be down in lateral recumbency. Reduction of conscious will occur and may progress to coma and death. Other signs include: Faint rapid heart sounds, profound gastrointestinal stasis and often severe bloat +/- regurgitation of ruminal fluid. | 0.25mmol/L |

It has been estimated that 65% of cows will rise to their feet soon after treatment and 15% within 2 hours. Failure to respond to treatment may be due to inadequate treatment and /or unrecognised concurrent condition such as mastitis. The cow should be reassessed after 6 hours and re-treated if necessary.

There are oral calcium products available, that can be given to mildly affected cows or sub-clinically affected cows or to cows at the point of calving that are high risk of developing milk fever.

The easiest and best way to prevent milk fever is to provide the cows with an optimal transition period which involves supplying 3kg of lead feed grain to cows containing anionic salts, restricting green feed intake to 2kg DM/cow/ day and provision of ad lib hay (cereal hay) for a 3-week period before calving.

The benefits of lead feeding are well established. As well as preventing milk fever lead feeding with grain enables cows to "hit their straps" earlier and produce more milk throughout the lactation.

Anionic salts in the lead feed work by acidifying the blood, which makes calcium more available from calcium reserves in the cow's skeleton.

The easiest way to see if the anionic salts are working is to measure the pH of the urine of a few dry cows. This can be carried out on cows that have been on the lead feed ration for at least 2 weeks. If the pH is less than 7 then the risk of milk fever is quite low but if it is 8 or 9 then the risk of milk fever is very high.