Grass tetany (hypomagnesemia)

Conditions when likely to occur:

Previous history on property.

Grass dominant pastures generally from autumn to spring with low Mg (<2g/kg DM), low calcium (<3g/kg DM), low sodium (<1.5g/kg DM), high potassium (>20g/kg DM) and high nitrogen concentrations (>50g/kg DM) predispose to the development of grass tetany. The ratio K⁺/(Ca⁺⁺ + Mg⁺⁺) can be calculated to determine the risk of grass tetany. If the ratio is above 2.2, then the risk of grass tetany is high.

The methodology to calculate this ratio corrected for valency and molecular weight is summarised in NSW Department of Primary Industries Primefact 785 Grass tetany in cattle - Predicting its likelihood and can be downloaded from the website: [http://www.dpi.nsw.gov.au/agriculture/livestock/health/specific/cattle/grass-tetany-predicting-likelihood](http://www.dpi.nsw.gov.au/agriculture/livestock/health/specific/cattle/grass-tetany-predicting-likelihood)

Grass dominant pastures from late autumn and winter will have lower magnesium and calcium concentrations and higher potassium levels, especially with very short pasture (1st leaf stage of ryegrass).

Predisposing conditions involve no residual roughage being left over from the previous season with high quality pasture having low fibre content leading to metabolic acidosis. The risk of grass tetany will tend to be higher with high quality pastures – a disease of intensification.

Short pasture, especially less than 1-1.2 t DM/ha, will usually predispose cows to weight loss. High producing cows will lose weight at over 1 kg/day and be at risk of grass tetany unless supplemented with magnesium or hay to prevent weight loss.

Fat cows are more prone to higher weight loss.

Grazing cereal crops are generally high risk.

The risk of grass tetany is compounded if cows are grazing pastures fertilised with potassium or if soils are naturally high in potassium.

Pastures post drought can tend to have high potassium, high nitrogen and low fibre creating an environment that is high risk. This can be compounded if cows have poor calcium reserves following extended grain feeding during the drought period.

Pastures top dressed with nitrogen fertiliser such as urea can be high risk.

Cows grazing pasture with low sodium concentrations, especially in high rainfall regions with no access to bore water are high risk

Very low soil phosphorous levels have been associated with an elevated risk of grass tetany due to poor magnesium absorption, especially in young cows.

Older cows >6 year are more at risk than younger cows. First and second calvers are sometimes at risk, especially when grass tetany involves complex mineral interactions.

The highest risk period is from calving through the first few months of lactation.

Autumn and winter calving herds generally have a higher risk of grass tetany than spring calving herds, though the risk with spring calving can be very high but usually only for a short period.

Periods of stress (marking, ovulation, AI program etc) in early lactation leading to low feed intake and magnesium deficiency. Severe weather leading to inappetence will also create a high risk situation in old cows.

A number of studies show Angus cattle tend to have a higher risk than Hereford, with Shorthorn having a highest risk of grass tetany. There appears to be genetic variation within a breed, though this is not well documented.
Clinical signs: Hyper-excitble, thrashing convulsions if recumbent.

Management strategy to prevent and treat disease:

Increase Mg intake to at risk group of cows:

- Feeding 60 grams Mg/day (causmag) on hay during at-risk periods.
- Intra-ruminal bullets provide Mg for up to 90 days.
- Feed hay (also source of calcium).
- Ensure constant access to feed.

Avoid high-risk pastures (high potassium due to K or N application or short pasture in 1–2 leaf stage) or pastures where cows have a history of grass tetany. K intake levels are minimised when plants are grazed at the 3-4 leaf stage.

If grass tetany still a problem:

- Consider licks with equal portions of fine limestone:salt:causmag mixed with molasses. For success, it is important that cattle are trained on to these licks initially with molasses. See Tool 6.4 for information on MLA’s Health Cost Benefit Calculator that can assist you to calculate the cost-benefit of control options.
- Lower herd age structure (See Module 5: Weaner throughput) as older cows are high risk.
- Autumn calving herds change time of calving to spring to reduce period of risk. This will not eliminate the risk of grass tetany but reduce the period where prevention is required. This decision should be considered with other management procedures.

Treat affected cows with subcutaneous injection of Mg hypophosphite (5%), calcium borogluconate (25%) – 500ml or 200ml of 50% Mg sulphate. Seek veterinary advice.

Respond to treatment magnesium hypophosphite (5%), calcium borogluconate (25%) 500ml or 200ml 50% magnesium sulphate intravenously.

Pasture assessment (availability, quality) and stock fat score assessment to assess risk of cows to grass tetany (fat lactating cows with rapid weight loss are at high risk).

Pasture leaf tissue test to evaluate mineral balance.

Soil analysis usually not a good indicator of grass tetany risk.

More information on grass tetany including causes, prevention and treatment can be found on the primefacts factsheet provided by the NSW Department of Primary Industries.