Milk Fever (parturient paresis) Version 2.0 21 March 2015

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The time for farmers to prevent milk fever (Parturient Paresis or Hypocalcaemia) is all year, but especially from one month pre calving until one month after.

You may ask, why all year? It is because facial eczema damaged cows with an already damaged liver, so sick body, have died very quickly after being subjected to a second whammy of mild milk fever (or bloat). After facial eczema first occurred in Taranaki decades ago, farmers and vets were surprised when affected cows died very quickly from bloat or milk fever. It was because of the Double Whammy effect of facial eczema liver damaged cows.

Another cause I've had to deal with this 2012/13 season is cows fed manganese in a soluble mineral mix designed by a consultant who adds manganese

Pastures must have tissue (leaf) analyses done twice a year and then be correctly limed and fertilised to have adequate calcium, magnesium and boron. The best boron fertiliser form is the new slow release OrganiBor. At the same time excesses must be corrected.

In the past sulphur in USA has been in excess from their coal burning power generating fumes. Now that these have been reduced, S is lower, so farmers are having to apply some, especially prior to calving, to prevent milk fever. Solminix has optimum levels of S. Some vets criticise Solminix, from jealousy, because most have not been trained in minerals, and fear of all farmers using it which would reduce vet visits to once a year to inject calves. See Free Items > Testimonials.

Other excess elements in many countries are potassium and nitrogen which in pastures must be no higher than the optimum of 2.7% and 4% respectively. Pasture manganese should be about 40 ppm. Higher levels cause stress in animals. If palm kernel extract has been fed at more than 2 kg per cow per day, or at any amount for too long, check the copper level in the liver, preferably in culls at the abattoir, and check the blood manganese level. Both cause bad health and are killers if in excess.

If applying LimeMagPlus close to calving because of Ca deficiency, ensure that all minerals must be correct. That is why serpentine and boron in mixes I do are at optimum levels. Agricultural lime fed on its own or applied a few months before calving is highly likely to cause milk fever. Not many cows need die to pay for the cost of serpentine and boron that can prevent deaths.

High Mag Solminix should be fed for two months before calving depending on all levels and until September/October depending on the clover content, pasture and cow health. Graze the mainly grass paddocks before calving and the higher clover ones from the day of calving. Doing so with the serpentine and boron should keep milk fever down. Selenium in the LimeMagPlus and in Solminix should mean easy calving and no retained placentas.

The NZ MAF analysed serpentine before 1900 and found that 86% of its magnesium was taken up by pastures, which is much more than from other magnesiums. Also Serpentine has many minerals because it was pushed up out of the sea before the sea was polluted like it is now. All recent sea products I've tested are high in mercury, cadmium, etc. I would not use any sea product as a fertiliser or supplement. Some are advertised as organic when no sea products are organic now because of pollution.

Cows affected sub-clinically by spring and/or facial eczema, about six months before, so had damaged livers, died even after Calciumborogluconate treatment, much to the surprise of farmers and vets. Post-mortems revealed damaged livers.

Veterinarians Dryerre & Greig (1935) and Hayden (1934) at Cornell University, USA, found that Calciumbboroglucenate cured milk fever. They in 1925, demonstrated the almost miraculous action of these items in saving milk fever. Solminix does the same because it has magnesium, but all need boron which is not easy to feed in water

Livers of killed animals can have slight mottling with light patches to discolouration and severe

distortion, which impair the functions of the liver. Check for facial eczema damaged livers that could make cows weaker.

Facial eczema can be 99% prevented by applying adequate lime for calcium, serpentine for magnesium and OrganiBOR for boron applied to pastures a year before to increase earthworms (Read Facial Eczema), by using pasture analyses to maintain pasture Ca at 0.8% and Mg at 0.24% or higher. Earthworms must be prolific to consume the dead pasture on which facial eczema spores breed. Read both Facial Eczema and Earthworms. Avoid using urea, which halves earthworm numbers, which are necessary to control facial eczema. Sulphate of Ammonia or N-Rich Ammo (50% urea and 50% sulphate of ammonia) are far kinder to earthworms and give better long term pasture growth. See Elements > Nitrogen for other forms of N.

When getting abattoir liver tests for copper, also get eczema liver damage.

To prevent milk fever, cows should be kept in a condition score of between 4 and 5 (1 to 10 scale) all year. Achieving this under grazing, when bought feed costs more than it returns in profit, may require reducing the number of animals and conserving pasture during surpluses.

Between two days before and two weeks after calving, is the highest milk fever risk period, with the day of calving and the next 3 days, the worst, but a few cows can suffer mild Milk Fever at any time.

Under wrong management, milk fever is a problem, and worse still it increases the risk of dystocia, retained placentas, displaced abomassums, metritis, and prolapsed uteruses.

Cows with low blood calcium (Ca) and low magnesium (Mg) have a greater risk of metabolic disorders.

Excess calcium, potassium, salt and/or phosphorus in the diet during late pregnancy increase the incidence of metabolic problems, so before calving keep cows off recently limed paddocks, those with a high legume content, and effluent paddocks.

Avoiding an excess of Ca stimulates cows' calcium regulatory system to keep the blood levels normal, by mobilising the body stores of calcium from the bone. When the demand for calcium increases at calving, calcium can then be mobilised rapidly from bones as well as from the feed, therefore preventing milk fever.

Feeding Ca or high Ca feeds before calving makes the animal's system inefficient at absorbing it from feed and from its bones, then when a lot is needed from the day after giving birth, calamity can occur. A SUDDEN change of diet at calving can cause metabolic problems because the rumen develops microflora for the feed being eaten, which can take two weeks to increase sufficiently to fully digest any new feed.

If you have to feed grain, keep the quantity down. Cows are ruminants, so don't feed them like pigs or poultry.

Never feed self-help (self feeding) minerals singly or in a mix, because some consume too much (especially salt), and some none. Many trials have shown that doing so creates more problems than it fixes. Farmers in America have had dreadful results, and comparative trials at Cornell Agricultural University in New York State proved the ineffectiveness of self help. A Waikato herd that used it had amazing differences in the health of cows because some were obviously doing a reasonable job of selecting minerals, while most were not.

The best nine soluble minerals (Salt (sodium and chloride), Mg, Co, I, Se, Zn, Cu, S) in a commercial mix like DeLaval Feedtech soluble minerals through an on-line water dispenser is the best system by far, because high producing larger animals need more and drink more, while young animals need less and drink less.

The following applies to farmers feeding bought feed because they can't control the analyses of what they buy. In the Northern Hemisphere, especially USA where it was developed for confinement feeding, Dietary Cation-anion Balance (DCAB) is important in Total Mixed Rations (TMR). However, not all cows need DCAB feeding, but it should be considered if metabolic problems are likely. It is a long and complicated system, not necessary for GrazingInfo farmers, so if you're using confinement and/or TMR, Google for DCAB.

USA's recommendation of only 0.2% S in their TMR could be why they have to feed so much Mg to stop milk fever. I recommend 0.4% S in pasture. USA information states that feeding magnesium sulphate, calcium sulphate, calcium chloride and ammonium chloride achieves good Ca levels in the blood, but many New Zealand farmers and vets have known for a long time that drenching with Mg chloride can cause gut and mouth ulcers. One said that the formate form is even worse, causing dead tissue. Some of the above has been published in the NZ Veterinary Journal.

Some North America recommendations are that phosphorus feed levels should provide 40 to 50 grams/cow per day. Much of theirs is in dry feed which is chewed more and takes longer to travel through the digestive system so more is absorbed than from NZ lush pasture, so I prefer 75% grass and 25% clover pasture to have 0.4% P on a DM basis, which gives the cow eating 18 kg about twice as much P. This level in the pasture also shows that the soil has sufficient for maximum pasture growth.

The incidence of milk fever can be reduced by slowing the passage of pasture through the digestive system. In the weeks before calving, feeding one kilogram a day of good hay helps achieve this, with about 2% of body weight of straight grass or minimal clover (rather than clover dominant pasture), with anionic (acid) salts. These are the sulphate forms, so magnesium sulphate is better than other forms of magnesium. DeLaval mineral mix is sulphate based. Chelated and oxide minerals don't have this advantage, cost a lot more and give no advantages, despite vendors claiming it does. Googling shows that those not sell chelated minerals know of no benefits, whereas sulphur minerals have advantages.

Correct length (75 mm or longer) silage does nearly as well as hay. One cm length maize silage doesn't, but if fed after eating long pasture it is better, because some is then regurgitated with the grass.

When P levels are low as recommended in USA, and pre–calving cows are getting only about 9 kg DM of pasture, they can suffer from low P at calving and be very difficult to get up from milk fever.

Cows require 1.8% of their pre–calving body weight of pasture, silage and/or hay dry matter pre–calving, with 0.4% P and 23% Mg or more. More Mg supplements will be necessary if artificial nitrogen has been applied.

Sulphur is important, so clover based pasture should have 0.4% sulphur, with nitrogen no higher than 4.5%, phosphorus 0.4%, calcium 0.8%, magnesium 0.23% or more and sodium 0.2% or more. The following pasture optimum levels are in ppm. Iron 90, manganese 50, zinc 50, copper 13, boron 22, molybdenum 1.5, cobalt 0.13, selenium 0.3, iodine 0.5 and aluminium below 100.

The two critical ones are potassium and sulphur. Potassium is much too high in most New Zealand pastures because the recommended soil test figure is too high, so it is often applied annually. With grazing, achieving the optimum, means ensuring that the grass and clover pasture tissue level of potassium is close to 2.7%, which is the optimum for a balance between pasture growth and animal health. Half that is aimed for in TMR. See Elements > Potassium.

Sulphate sulphur leaches in high rainfall and irrigation areas, so is often low by the end of rainy seasons, but not if sufficient element S is applied.

Use elemental S in fertilisers with reactive phosphates, to reduce waste and pollution by leaching, and when nitrogen is needed apply N-Rich Ammo, rather than urea which has none of the S that is so necessary for the functioning of nitrogen and for animal health.

High Magnesium DeLaval minerals (which are sulphate-based) fed in the drinking water and/or mixed with Australian Causemag magnesium oxide before spreading on pasture, increase the effectiveness of magnesium. See Elements > Magnesium.

To achieve adequate magnesium levels in pastures, the soil should be at least pH 6.

The above show that the sulphate forms of minerals are necessary, but some sales people push oxides, and, worse still, chelates, which are very expensive per kg of actual mineral. Both require more to be fed than sulphate forms and I know of farmers not getting good results with them.

Identification

A problem with milk fever is being sure that the diagnosis is correct, and that there are no other subsidiary and/or accentuating causes. The chapter on Animal Health > Symptoms & Causes explains these. Open the chapter and search for Milk Fever, and you'll see the large number of things affecting it.

It occurs mostly in older, high producing beef and dairy cows within a few days of calving, but occasionally it can occur several weeks before or after.

Early signs of milk fever can include reduced appetite with a preference for roughage, reluctance to move and ‘drunken’ or excited behaviour, walking in circles aimlessly, with vigorous licking, anxiety, stiffness and trembling.

An affected cow is often just found lying down, characteristically with her head tucked beside her body, and can’t stand up. She is usually cold to touch, with a low body temperature and dry staring eyes, heavy breathing and a faster heartbeat.

Don’t milk her and don’t allow calves to suck from her because the load of suddenly producing a lot of milk can be too much. When better, still don’t milk her for one day, and on the next day remove only half the milk. Check for mastitis daily just by a quick feel to avoid causing let-down.

Treatment of all milk fever cases is urgent, but if she is lying on her side with legs stretched out and almost unconscious, it is extremely so. The longer a cow is ‘down’, the greater the chance she will stay that way.

Bloat often develops and regurgitation of the rumen contents is likely which can cause choking. If left untreated, at this stage most animals die.

If possible use a hay bale or similar to raise the head to avoid choking.

Inject Calciumborogluconate into a vein. The milk vein is usually the easiest.

Famous zinc expert, the late Gladys Reid, found that a tablespoon of zinc sulphate in the mouth helped milk fever downers low in zinc to stand up. See Elements > Zinc.

Other deficiencies such as magnesium and phosphorus can contribute to the problem, so it can be safer to inject a combined mineral solution. Usually 600 ml is required. Warm it to blood temperature of 37 ºC (~99 ºF). Knowledge and experience of how to inject is essential, or use a vet.

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