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Acidosis is a pathological condition associated with increased acid or decreased alkaline levels lowering the rumen pH. Correct LimeMagPlus based on leaf analysis helps avoid acidosis. Eating too much unaccustomed feeds such as grain too quickly.

Poor animal health in grazing cows during early lactation can be from -

Wet, cold, rainy, weather with minimum sunshine adversely affecting pastures and animals.

Low Co caused by insufficient Ca and too much N applied over many years, which reduces organic matter content of soils, so Co is leached out.

Low saliva in the rumen from not feeding Solmin and not applying salt in LimeMagPlus and not regurgitating finecut maize silage aggravated by high K causing faulty rumen function causing Ketosis.

Non cycling cows and hard to get in calf cows.

Cost of solving it should not be considered if milk goes up and deaths are eliminated.

This is a man-made severe digestive disturbance causing ruminants to go off feed and become nervous. It occurs mostly in dairy cows producing highly in the months soon after calving, but can also occur in feedlot cattle receiving high--energy low-fibre feed. Their going off feed aggravates the problem. Acidosis can be brought on by anything which causes a drop in true feed (dry matter, not high moisture pasture) intake. Sick animals should be fed good mixed feed with molasses or a molasses based additive to reduce the chances of acidosis aggravating the original problem.

Sheep can also suffer acidosis if fed too much bought grain type feed (BF), even if changed to it gradually over six weeks in one case I heard about.

On pasture this generally occurs for one of two reasons.

1. There is too high a level of soluble carbohydrates and starch and not enough fibre. Topping (clipping) removes what will be fibre at the next grazing.

2. If the pasture is ample and optimum length of at least 15 cm (6"), then cows will usually eat enough to prevent the acidosis, provided too much grain is not fed. If pasture is long and stemmy they won't eat enough, will eat more grains and be more likely to get acidosis. Also if pasture is too short and sappy, they won't get enough roughage (fibre).

Some people refer to these as diseases, but in my book diseases are health conditions that are infectious or spread between animals such as Foot and Mouth Disease and Anthrax. Ailments are illnesses caused by conditions, management or lack of it, rather than by an infection.

Some older cows are prone to metabolic ailments even under good management, however factors which accentuated them include hunger, mineral shortage or imbalance, bad weather (even excess rain or insufficient sunshine which increases pasture nitrate levels and lowers sugar and Mg absorption by animals) and poor quality feed. MF and GT are highest when pasture is fed without any supplements such as crops, hay or silage, and can be almost completely avoided by feeding a high percentage of good highly digestible brassica crops. Pasture with high potassium and low sodium levels, which is typical of that found on many farms because of excessive use of potassium, is more prone to cause MI.

A Te Awamutu vet organisation in the 1970s found that cows getting winter brassica crops suffered much fewer MI than those not getting autumn or winter crops.

The more water soluble nitrogen, phosphate and potash used, and the less boron, the more MI can be expected, unless levels are balanced with other elements and by supplementing with Mg and other deficiencies when required,

Feeding forage crops, hay and silage, and taking all the known precautions such as avoiding hunger (including anything that puts the animals off their feed), sudden changes or stress, and feeding more in bad weather, etc., are also important.

When cows are strip grazed and pasture is rationed, MI can occur in one that comes back to the milking parlour looking for its calf, or is in season, or even has a sore foot, for instance, that hinders her competing with the rest of the herd for food.

The more grass fed before calving, the more MF and GT can occur. The more legumes, crops, hay, silage and other feeds, the less MF and GT is likely.

Ensure cows eat plenty of good feed immediately before calving and for three days after. Obviously they should be fully fed from calving on, although this is not always possible, but hunger around calving must be avoided, as must sudden diet changes.

Stress, bad weather, starvation and prolonged labour increase the likelihood of MI. Ensure that there are no other stress-causing problems, such as parasites and mineral deficiencies. When required, provide shelter.

Zinc and/or cobalt deficient animals lose their appetite, can't compete for feed in a mob, and lack gut mobility, so that they do not get adequate feed, Ca, Mg or zinc. They nibble at pasture all day, so consume more soil which further aggravates the problem.

For optimal input of Ca at calving, provide ample good feed before storms, watch for cows with cold, droopy ears and cold teats. Old animals, some individuals, some families and some breeds, suffer GT and MF more than others. Austrian alpine farmers crossed their Pinzgauer dairy cows with red and white Friesians to increase milk production and GT and MF increased. They then maintained about 80% Pinzgauer and had no problems of cows going down on their steep remote mountains.

Supplying salt at more than 0.005% of cows' live body weight (25 grams to a 500 kg cow) before calving can aggravate MI.

Pasture, Feed & Animal Health

Metabolic, briefly in practise means affected by what and how they eat.

As well as growing plenty of pasture, it is essential that the pasture be healthy for its own benefit to grow well, and for the grazing animals' health. Applying all the required fertilisers, lime and trace elements can help achieve this.

Applying cobalt on pumice areas of New Zealand saved ruminants from dying, selenium in New Zealand and other countries saved sheep in particular from suffering white muscle disease and lamb deaths soon after birth.

High rainfall areas such as much of New Zealand and parts of north west USA have to apply trace elements to be able to farm grazing animals profitably, but lower rainfall areas where the deficiency problems were not so severe, got by without applying deficient elements, but more recently many in these areas have discovered the benefits.

Symptoms

Initial signs include loss of appetite, milk production decreases, sunken eyes and very thin diarrhoea. The milk protein and fat percentages can fluctuate or decrease.

Causes

Animals can die within 24 hours of over-eating grain or by-products, such as brewers' grains, tapioca, apple and kiwi fruit. Ripe food is apparently more toxic than unripe food. Acidosis is caused by the ingestion of too much ruminally fermentable carbohydrates so consumption of large quantities of concentrates over a short period by unadapted cattle and too much short lush pasture lowers the rumen pH to about 6. As the pH decreases (acidity increases) many of the normal bacteria and protozoa are inhibited or killed, releasing endotoxins. Saliva helps maintain the right pH, but guzzling BF and/or short lush grass without chewing it and regurgitating it (short material can not be not regurgitated, so passes on through the system), so insufficient saliva is mixed with it.

Lactic acid is also absorbed from the rumen and causes a drop in blood pH which can cause the cows to stop ruminating and go off feed, aggravating the problem. Death can occur but usually cows recover after a few days, but milk production suffers. Sulphur levels can drop causing a loss of hoof strength and laminitis (hoof and tender part of foot become softer), increasing susceptibility to injury. Avoid –

- Hunger.
- Sudden changes of diet.
- Cows in season not getting sufficient to eat because of bulling so not grazing until most of the pasture has been eaten.
- Anything which causes animals to go hungry such as other sicknesses, bad weather and being in the yard for hours waiting for artificial insemination or the vet. Provide them with hay or long-cut pasture silage. Short-cut maize silage can aggravate the problem.
- If the pasture is ample and optimum length of about 150 mm (6”), then cows will usually eat enough to prevent the acidosis, provided too much BF is not fed. If pasture is long and stemmy they won't eat enough, will eat more BF and be more likely to get acidosis. Also if pasture is too short and sappy it will have too high a level of soluble carbohydrates and starch and not enough fibre. Topping removes what would be fibre at the next grazing.
- A sudden change from dry winter feed or mature autumn saved pasture to new short spring pasture.
- Too much grain or concentrates fed at any one time rather than twice or more often each day.

Old dry pasture and poor quality conserved feeds, as well as low in feed value, are unpalatable causing low intake and low digestibility, resulting in slow passage through the stomachs and low animal production.

Short lush pasture is highly palatable and rapidly digested, but lowers the rumen pH to below 6, partly because there is less cud chewing so less saliva absorption. This can bring on acidosis. Its high moisture content (90%) means that more has to be eaten to give adequate nutrition. Dairy cows fed solely on short 1,700 kg DM/ha (10 cm – 4 inch) lush spring and or new autumn pasture can be so severely affected that their milk and milkfat percentage drop and they lose condition, until the microflora in the stomach and intestines adapt to the new diet.

The autumn flush of young lush pasture has a greater adverse effect than the spring one because elements such as nitrogen and potassium increase in the soil during the dry conditions

when they are not being used by plants through a lack of moisture, then have a powerful effect, boosting pasture growth astronomically.

Almost all New Zealand dairy cows get through the change from dry summer pasture to lush usually over a few weeks after autumn rains fall in about mid March without much trouble, but some don't, so their milk production crashes. Feeding a little good quality hay or silage with the lush pasture reduces the problem.

Milk fever (MF) can be brought on by supplementing with calcium (Ca) and/or magnesium (Mg) prior to calving and then stopping at calving, because digestive systems adapt to get either as much as possible out of the feed when an element is in short supply, or only as much as they need out of the feed when there is more than enough. This animal ability is slow to change so even feeding pasture with ample Ca (as in legumes or limed pasture) before calving and then pasture low in Ca (grass only or low Ca pasture) after calving can cause MF.

Prevention

To reduce the chances of acidosis affecting animals on pasture –

- Fully feed on good clover/grass pasture starting at higher than 2,700 kg DM/ha (15 cm – 6 inches).
- Don't top (clip) pastures. Animals will eat the longer pasture which is less harmful.
- Aim for ample clovers and not too much annual ryegrass.
- Feed about two kg/day of good hay or silage or even barley straw per grown cattle beast or 0.25 kg per lamb before they eat too much pasture, especially if the pasture is short and sappy.
- Try and avoid using artificial N, although if it has to be used to grow more pasture to feed animals better to reduce acidosis, use it sparingly.
- Avoid all sudden changes of hay to silage or to grass, etc., and avoid sudden changes of mineral availability.
- When short of pasture, and silage and hay are not available, feeding BF can actually reduce the chances of acidosis, however, to reduce the chances of acidosis when feeding it to animals on pasture keep in mind that crushed or rolled barley grain produces more milk and fewer problems than concentrates when cows are grazing good pasture. Also –
 - Grain and more so concentrates, can be a cause of acidosis (and displaced abomasums).
 - BF should be fed in at least two feeds a day after feeding pasture, silage or hay, or mixed with silage and/or hay.
- Animals should be adapted gradually to BF over a few weeks to avoid digestive upsets which is a cause of acidosis in itself.
 - Feed pasture, silage and/or hay prior to BF.
 - Feed less BF.
 - Add 1% bicarbonate of soda to BF – if not already in it.
 - Feed BF in the paddock along fence lines (permanent or temporary) AFTER cows have eaten pasture, silage and/or hay. Molasses in silage or over it or hay helps.
 - Be careful of greedy cows that eat more than their share.
 - Watch for animals which initially don't eat BF then when really hungry get the taste for it and guzzle it.

Treatment

Treatment for acidosis is difficult, although the controlled feeding of buffers such as hay, silage, barley straw, molasses or bicarbonate of soda may provide some relief from the high acid

conditions. Removal of BF from the diet and replacing it with good silage, hay or even barley straw will help.

Animals can tolerate more sulphur in feed than when it is supplemented dry. Maize is low in most minerals, e.g., sodium, iron, manganese, copper, zinc, cobalt, iodine, selenium and copper, and low in protein.

Drench sick animals with one of the treatments available.

Alkalosis is the opposite to acidosis.

This is the opposite to acidosis and can occur when animals graze pastures fertilised with high pH level products such as boiler ash, basic slag and/or excess lime. The rumen pH increases and symptoms similar to acidosis occur.

Never fertilise pastures which are damp unless rain will continue and wash it off and never graze fertilised pasture until all is washed off all leaves which usually takes 25 mm (an inch) or more. Never fertilise with boiler ash. It can be eaten and has killed hundreds of animals. Don't even use it on lanes. Mineral deficient animals have eaten it and died.

Ketosis (Acetonaemia (Ketosis/Sleepy Sickness))

In ewes it is called Sleepy Sickness, Pregnancy Toxaemia or Twin Lamb Ailment.

An inadequate supply of the nutrients necessary for the normal carbohydrate and fat metabolism that is seen mainly in times of high milk production in early lactation, and rainy, cold, windy weather, when pasture energy levels also drop. Molasses or similar products can help.

The excessive ketone bodies in the bloodstream come from the breakdown of fat when the animal is forced to draw on its bodily reserves for energy. Although the metabolism of body fat provides energy for cows, the nervous system is dependent on glucose, and the ketones produced as a result of excessive fat metabolism can have toxic effects. The excess ketone bodies are eliminated in the urine, milk and breath of the animal.

Ketosis may develop from poor diet or periods of stress such as cold and wet weather on low energy food. It may also affect apparently well-fed cows producing very large volumes of milk.

Low cobalt and possibly phosphorus have been suspected as causes. High K, low energy and bad cold weather accentuate it.

When grazing, sheep tend to select the more digestible parts of the plants than cattle. Sheep also have less powerful jaws and need a longer time chewing their cud and they grind their food particles finer than cattle (van Soest 1994). Sheep spend a shorter time eating than cattle, but a longer time ruminating. On pasture, sheep spend half the time eating compared to cattle, but almost four times longer chewing.

Plants that increase the risk of acidosis are short lush lucerne, clover and very lush short temperate and subtropical grasses, and supplements of short pasture and short silages and grains. By the time you have got a silage analysis and a vet, the animals could be dead, so learn the possible causes of acidosis and avoid them.

Feed that can't be regurgitated is a major cause of acidosis, so short ryegrass when fed in combination with concentrates or similar can cause it. The reason is not so much the lack of chewing as much as the lack of saliva which has a high pH and is the first digestive juice. Something many farmers and scientists don't know, is that for a ruminant to make saliva it must have adequate sodium, which makes saliva, that is why one must monitor ruminants chewing the cud. They should have saliva dribbling out their mouths.

Lick blocks won't give them enough and not all animals will eat loose minerals, so the drinking water is the best medium - as well as the soil. About 100 kg of coarse agricultural salt per hectare per annum with Gafsa and deficient minerals, or LimeMagPlus with deficient minerals, annually or more often, is the best. It also makes pastures more palatable, so animals eat more and produce more.