



FACT SHEET

DECEMBER 2020

RUMEN ACIDOSIS

This disorder usually occurs in sheep that are introduced rapidly to grain feeding or have been grazed on stubble paddocks where there is a lot of grain left after harvest. This disorder is also called lactic acidosis or grain overload.

CAUSE OF DISORDER

Grain is often used in the late summer and autumn months as a supplement to fill feed shortages in dryland situations as well as to put condition on ewes pre-tupping. However, just like kids with ice cream and given the opportunity, sheep will often gorge themselves if they are introduced suddenly to grain feeding. This is especially true if they are hungry before the grain is introduced such as the introduction of grain to a flock in drought situations where little feed is available.

Rumen acidosis is a two stage process:

- the grain overload causes the excess production of volatile fatty acids in the rumen
- this then causes the rumen pH to drop below 5.5 at which point, around six to eight hours, naturally occurring lactobacilli in the rumen start converting the grain to lactic acid which drives the rumen pH even lower to <5.0.

The lactic acid, as well bacteria and some other toxins, are then absorbed into the bloodstream causing many of the clinical signs. The high concentration of lactic acid in the rumen also kills off many of the beneficial microbial species and as a

result the rumen stops working. Sufficiently severe grain overload will eventually produce metabolic acidosis which results in toxic shock and death.

The smaller the grain particle, the more rapidly this occurs so farmers must be careful with smaller and crushed grains. Some sheep are more likely to gorge themselves on grain than others in the flock. It is these sheep that are likely to be affected first.

CLINICAL SIGNS

The severity of the clinical signs depends on the amount of grain consumed by the individual animal.

- Within the first few hours after over-consumption, the sheep will stop eating and may appear to have abdominal pain and appear restless.
- Over time, mildly affected animals will go off feed and appear dull and depressed with some diarrhoea.
- The signs then become more severe; animals may stagger and appear blind and bloated. They will look very depressed and appear to be dehydrated with profuse diarrhoea.
- The abdomen will look very rotund (bloated) and there will be no movements heard from the rumen. The abdomen will feel doughy.
- The sheep will usually become cast, refuse to move when disturbed and appear to be sleepy.
- The heartbeat and respiration rate accelerates, and the animal may have severe dehydration.
- As the acidosis progresses the body temperature falls and the mucous membranes (gums etc.) begin to pale and gradually become cyanotic (blue/grey looking). Chances of recovery from this point are very slim.
- In less affected animals, lameness may occur; this is usually caused by laminitis (similar to the horse disorder).

TREATMENT

The success of treatment depends on the time since the grain was ingested and the amount eaten by the individual animal. The prognosis is not positive if the affected animals are showing signs of shock, and death is therefore likely. At a flock level, and depending on the severity, there will often be a small number of animals which will suffer from metabolic acidosis and may perish.

However, there will often be a proportion of the flock which will suffer from sub-acute rumen acidosis, which is acidosis that is not severe enough to cause severe ill health or death. These mildly affected animals must be removed from the source of grain and offered roughage. Until recently the advice was to also give these animals oral drenches of magnesium oxide or sodium bicarbonate, however recent research by Jim Gibbs at Lincoln University has shown that this action will make the affected animals worse. Dr Gibbs has shown that the signs of acidosis are caused by increases in rumen osmolarity, and not acidosis per se, and that by drenching with magnesium oxide or sodium bicarbonate you will only make the osmolarity worse. Making it less likely the animal will recover. Instead just wait it out and allow the animals to recover on their own without drenching, any animals not improving by 12 to 24 hours should be re-evaluated and probably destroyed.

In addition, all affected sheep should be given calcium, 50 ml of warm 25% calcium borogluconate under the skin, and penicillin to prevent liver abscesses forming.

Slowly increase the amount of grain offered to the flock over 10-14 days to adjust to a grain diet. The feeding regime should start off at about 50 g/sheep/day and be increased by 50 g every second day until the final allowance is reached.

All animals should be fed hay or a source of roughage to attempt to stimulate proper rumen function. The provision of roughage will also stimulate salivation. Saliva is naturally full of pH buffers that will help prevent and control acidosis.

Some animals will not fully recover, remain thin and it is likely that these animals have developed liver abscesses or peritonitis and should be humanely destroyed. Speak to your vet to discuss options for those animals with clinical acidosis. All animals will need to be reintroduced to grain feeding, starting again at low allowances.

PREVENTION — FEEDING GRAIN TO SHEEP

Prevention is most certainly the best medicine. With the lack of success in effectively treating severe acidosis, it is important to be aware of how to feed grain to sheep to minimise the chance of acidosis.

It is important to both train (get sheep to eat a novel feed) and transition (ensure their gut can digest it) to feed on grain before they are expected

to ingest a large ration in their diet. Offer the animals only a small amount of grain to begin with and then slowly increase the daily amount.

The rumen and its bacteria can take a long time to adjust to grain feeding. Slowly increase the amount of grain offered to the flock over 10-14 days to adjust to a grain diet. The feeding regime should start off at about 50g/sheep/day and gradually increase to the final allowance. Note these rates are only for mature sheep, and it is important they have access to other feed, especially roughage material such as hay or standing pasture whilst the grain diet is introduced. This ensures the sheep continue to chew their cud and acid does not buildup in the rumen. Farmer discretion is advised and regular observation is required during this adjustment period.

Feed out the grain so all sheep have access to it; this reduces the chance of a few sheep gorging themselves on the grain. This can either be done in long troughs or dribbled in a long line all over the paddock.

There are some buffers which can be added to the grain as a preventative strategy to prevent acidosis from occurring, e.g. bentonite clay or sodium bicarbonate can be added to grain based rations during the introductory phase. This will hasten the rate of acceptance and reduce the risk of acidosis but is probably only practised in trough feeding situations. Speak to a feed manufacturer or your local vet to discuss these options.

REFERENCES

West, D. M., Bruere, A. N., Ridler, A. L., (2009). *The Sheep- Health, Disease and Production, 3rd Edition*. Foundation for Continuing Education of the New Zealand Veterinary Association, Massey University. Palmerston North, New Zealand.

Ratray, P. V., Brookes, I. M. and Nicol, A. M. (2007). *Pasture and Supplements for Grazing Animals: Occasional Publication No. 14*. The New Zealand Society of Animal Production, Hamilton, New Zealand.

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B+LNZ RESOURCES

PDF downloads:

- A guide to feed planning for sheep farmers resource book
- 400 Plus resource book

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