

Managing acidosis

Rumen pH

The need to buffer the rumen against low pH levels has increased in recent years as diets have changed due to dry conditions, higher grain to forage ratios, an increase in the use of byproducts in feed rations and silage feeding. Large amounts of silage may lead to wet diets and in some cases excessive mixing of rations reduces fibre particle size.

Rumen pH (the acid measure) should be mildly acid and in the range of 6.2 to 6.8, pH 7 being neutral.

Low pH results in a reduction in fibre digesting microbes and changes in the end products of digestion. These end products or volatile fatty acids affect the levels of butterfat and protein in milk. Intakes can also be affected by chronic acidosis, resulting in lower milk production and a change in milk components.

There are several management practices that can reduce chronic acidosis, the primary method being to feed buffers.

Buffers

Sodium bicarbonate is the most effective buffer used to stabilise the rumen. Sodium bicarbonate is available as a feed additive but is also contained in saliva and hence the importance of feeding what is termed functional fibre.

Barley straw at 1-1.5 kgs fed in a long form is ideal in many rations. Silage may contain useful fibre but the high moisture content and finer particle size may depress salivation.

To emphasise the effectiveness of cudging or rumination, American researchers have shown that a 700 kg cow is estimated to secrete 1100 grams of sodium bicarbonate per day in saliva. The addition of 245 grams of bicarbonate in the feed as a buffer would equate to the bicarbonate in just 22% of the saliva.

Cows should spend 8-9 hours ruminating. Another useful management tip is when undisturbed, 40% of cows should be seen ruminating at any one time.

Feeding rates

Three guides are used:

- feed at a rate of 110-220 grams per cow per day. The higher levels are required when concentrate intakes are in excess of 8-10kgs per cow per day,
- 0.5-2.0% of the grain mix or 0.75-1.0% of the total diet,
- 15 grams of bicarbonate and 8 grams of magnesium oxide per kilogram of grain.

Alkalisating Agents

Magnesium oxide (causmag) is an alkalisating agent often fed at 40-60 grams per cow per day. The primary role of causmag is to supply magnesium in diets utilising large amounts of oats and/or ryegrass that might predispose animals to grass tetany.

Bicarbonate may also depress serum magnesium concentrations and for this reason some nutritionists use both ingredients.

Bentonite is not technically a buffer, it swells when in contact with ruminal fluids. The action is to slow down the rate of passage, it is included in diets at 300-400 grams per cow per day. Because it takes up valuable rumen space it is often not the preferred ingredient for acidosis control in dairy rations.

Limestone, (calcium carbonate) does not have any buffering capacity.

Additives

Ionophores such as Bovatec and Rumensin make no registered claim to control acidosis.

Eskalin, an in-feed additive is registered for use in complete rations to reduce the risk of acidosis caused by high grain levels. Eskalin is available in two forms, as Eskalin 2% premix and Eskalin 500 concentrate.

As with all additives complete mixing is essential. Some of the mixing problems occur because of the small inclusion rates and sometimes the products may stick to molasses or fat in the mixer. Wet feeds may also contribute to the mixing problem.

Conclusion

Rumen acidity may be one of the first limiting factors in your nutrition program. Unfortunately because products like sodium bicarbonate act almost instantly its full potential may be lost as the acidity caused by slug feeding may take 60 minutes to occur. The importance of a balanced ration and available fibre cannot be overstressed.

Source: Queensland Department of Agriculture, Fisheries and Forestry; 2007