

Virginiamycin in grain based diets for lactating dairy cows

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The rapid fermentation of carbohydrates in the gut of cattle and sheep fed diets containing high levels of grain can lead to the accumulation of acid and low pH in the **rumen**, **hindgut** and faeces (Dunlop, 1972; Godfrey et al. 1992). This can lead to decreased production and, in severe cases, death

An experiment was conducted to investigate the roles of virginiamycin (VM), an active agent against gram positive lactic acid producing bacteria, and the buffer sodium bicarbonate in maintaining higher pH in **digesta** and faeces. The experiment was conducted over 28 days and involved 71 dairy cows which were fed 10 kg of high grain pellets per head per day. It was designed as a 2 x 2 factorial design with or without VM (30 mg/kg or 0), and sodium bicarbonate (20 g/kg or 0). Data were statistically assessed using repeated measures analysis. There was no interaction between treatments in their effect on any parameter reported in Table 1.

There was no significant effect of sodium bicarbonate on **rumen** pH, faecal pH, potential for L-lactic acid accumulation in **rumen** fluid or milk production. Faecal pH was significantly higher, and the potential for lactic acid accumulation in **rumen** fluid was

significantly lower with inclusion of VM. There was a trend for **rumen** fluid pH to be higher in cows fed pellets with VM. Cows given VM had a higher milk production over the trial period than those not treated with VM (23.94 vs 23.32 kg/head/day, $P=0.09$). Milk fat and milk protein content did not differ significantly ($P>0.15$) as a result of dietary treatment. It appeared that animals had more stable environment for fermentation, and there was less risk of acute acidosis as a result of including VM in the diet.

References

- Dunlop, R.H. (1972). Pathogenesis of ruminant lactic acidosis. *Advances in Veterinary Science* **16**, 259–301.
- Godfrey, S.I., Boyce, M.D., Rowe, J.B. and E. J. Speijers (1992). Changes within the digestive tract of sheep following engorgement with barley. *Australian Journal of Agricultural Research* **44**, 1093–1101.

Table 1 Faecal pH, **rumen** pH and potential to accumulate L-lactic acid in the **rumen** of dairy cows fed a high grain pellet without VM (Control) or with VM at 30 mg/kg.

Measurement	Control	VM	P-value
Faecal pH	6.59	6.72	<0.01
Rumen Fluid pH	6.90	7.00	0.09
Potential L-lactic acid accumulation (mmol/L)	36.0	16.5	<0.01