

SOME RUMEN PARAMETERS IN ANIMALS FED HIGH SALT DIETS

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Dryland salinity is a major problem affecting productive agricultural land in Australia. This land can be revegetated with halophytic pastures for grazing, but the adverse effects of high salt intake on livestock is a major concern for producers grazing their animals on these plants (Wilson and Graetz 1980; Masters *et al.* 2005). Determining the impact of a high salt load on animal production and health is essential if new production systems are to be based on saltland pastures. This paper reports the effect of feeding diets high in salt on some rumen fermentation variables in cattle and sheep.

Twelve steers and 12 sheep were fed either a low- salt (1.5 % NaCl) or a high-salt (20 % NaCl) diet for 28 days. Rumen fluid was collected from each animal before and after the feeding period. The variables that were measured in rumen fluid were NaCl content, pH and volatile fatty acids (VFA) concentrations and ratios.

Table 1. Rumen fermentation variables in animals fed low (1.5% NaCl) and high salt (20% NaCl) diets

Variable	Day 0		Day 28	
	Low salt diet (Group 1)	High salt diet (Group 2)	Low salt diet (Group 1)	High salt diet (Group 2)
Cattle				
NaCl (% w/v)	0.85 ^a	0.80 ^a	0.85 ^a	1.15 ^b
pH	7.56 ^a	7.63 ^a	7.60 ^a	7.15 ^b
Total VFA (mmol/L)	64.2 ^a	60.0 ^a	51.9 ^a	37.6 ^b
Acetic:Propionic:Butyric	66:21:13	67:20:14	67:22:10	76:18:7
Sheep				
NaCl (% w/v)	0.75 ^a	0.77 ^a	0.78 ^a	0.79 ^a
pH	7.33 ^a	7.55 ^a	8.20 ^b	8.40 ^b
Total VFA (mmol/L)	41.5 ^a	36.6 ^{a,b}	28.1 ^{b,c}	19.9 ^c
Acetic:Propionic:Butyric	68:18:13	64:20:16	71:12:17	77:13:10

Significance: values within rows not having the same superscript differ (P<0.05)

In cattle receiving the high-salt diet there was a significant increase in intra-ruminal salt concentration, accompanied by a reduction in pH and total VFA concentrations (Table 1). In these animals there was also increase in the proportion of acetate at the expense of propionate. In contrast, sheep fed high-salt diets maintained low intra-ruminal salt concentrations, but the pH increased and the total VFA decreased in both treatment groups in the second part of experiment. Similar to cattle, the lowest VFA concentrations and highest acetate to propionate ratio were in sheep receiving high-salt diet.

The results obtained in this study provide evidence that salt intake plays a significant role in rumen fermentation in cattle. While feeding diets high in salt to cattle affected rumen parameters and stimulated unfavourable pathways of microbial fermentation, results were not conclusive in sheep. Further research is needed to investigate the effect of salt intake on other rumen parameters and on animal performance to warrant productive grazing of saltland pastures in the future.

MASTERS, D.G., RINTOUL, A.J., DYNES, R.A., PEARCE, K.L. and NORMAN, H.C. (2005). *Aust. J. Agric. Res.* **56**: 427.

WILSON, A.D. and GRAETZ, R.D. (1980). *Aust. J. Agric. Res.* **31**: 369.

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