

RUMEN EPITHELIAL CHANGES OF LAMBS FED HIGH GRAIN DIETS AND THEIR EFFECT ON LIVEWEIGHT.

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Gross changes in the rumen epithelium can occur in sheep eating diets containing high proportions of grain (Bigham and McManus 1975). These include clumping of papillae, parakeratosis, hyperkeratosis and ulceration of the rumen wall. In this study the incidence of rumen damage in lambs fed either 100% whole wheat or 70% whole wheat plus 30% hammermilled lucerne hay and its relation to liveweight have been investigated.

One hundred and sixty five mixed sex Merino lambs were weaned at seven weeks of age onto the experimental diets. After balancing for sex and weaning weight, they were held in eight pens, four for each diet, for 14 weeks. At the end of this period they were weighed, slaughtered and their rumens removed and visually inspected. Rumens were scored from 9 to 0 by deducting points for presence and degree of clumping and ulceration. Papillae length (1) and breadth (b) were measured in the floor of the ventral sac and the top of the dorsal sac and 'papillae size' was determined from the product $1 \times b$.

When estimated between pens, inclusion of a roughage in whole wheat grain diets increased feed intake and liveweight but did not reduce the severity of rumen damage as assessed by rumen score or size of papillae in the dorsal sac (see Table). Within pens, liveweight was linearly related to rumen score ($P < 0.001$) and had a quadratic relation with dorsal sac papillae size ($P < 0.01$) and with ventral sac papillae size ($P < 0.01$).

TABLE: Effect of including roughage in whole wheat grain diets on lamb intake, liveweight and rumen parameters

	Wheat		Wheat plus Roughage		Significance of difference
Feed intake (g head ⁻¹ day ⁻¹)	494.5	±20.0	575.7	±20.0	P<0.05
Final liveweight (kg)	16.33	0.66	19.11	0.66	P<0.01
Rumen score	6.42	0.45	6.21	0.46	N.S.
Dorsal sac papillae (mm ²)	5.38	0.44	5.21	0.44	N.S.
Ventral sac papillae (mm ²)	2.41	0.19	1.32	0.19	P<0.05

The main cause of rumen damage seen on high grain diets has been shown to be low ruminal pH following feeding (Ørskov 1974). That inclusion of roughage did not reduce rumen damage is probably due to the increased intakes of lambs on the wheat plus roughage diet. Investigations of the relations estimated within pens will be reported later.

BIGHAM, M.L. and McMANUS, W.R. (1975) - Australian Journal of Agricultural Research (in press).

ØRSKOV, E.R. (1974) - Research in Veterinary Science 14 : 110.

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