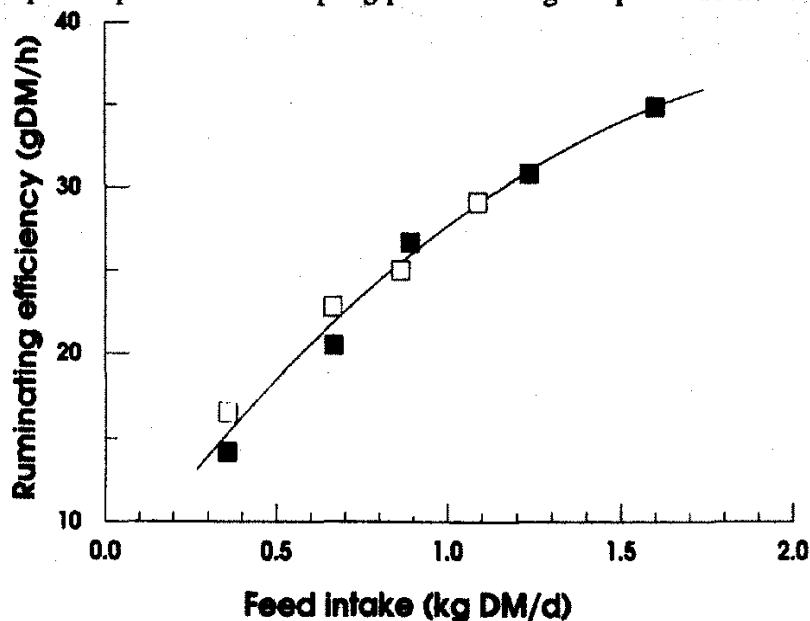


## EFFECT OF LEVEL OF INTAKE AND GRINDING OF LUCERNE HAY ON THE EFFICIENCY OF RUMINATION IN SHEEP

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The time that sheep spend ruminating increases with feed intake but decreases per unit of intake (Faichney 1986). This indicates that ruminating time is spent more efficiently as intake increases, perhaps because of an increase in chewing rate (Ruckebusch 1988). Also, it is well known that fine grinding of forages substantially reduces ruminating time (Faichney 1986) but its effect on ruminating efficiency has not been reported. Ruminating efficiency, defined as rumen large particles (DM retained during wet-sieving (Faichney 1986) on a sieve of mesh 1.18mm) comminuted to pass a 1.18mm sieve per hour of ruminating time, is examined here in sheep given lucerne hay, either chopped or ground (6mm screen) and pelleted. The extent of apparent fermentation of large particles is also reported.

Six Corriedale wethers (initial mean liveweight  $43 \pm \text{SE } 1$  kg) fitted with rumen and abomasal cannulae were given the diets at 0.2 to 0.9 ad libitum (Faichney 1983). Comminution of rumen large particles was calculated as the product of the rumen pool of such particles and their fractional comminution rate, determined from the partition of the passage of indigestible acid-detergent lignin through the rumen (Faichney 1986; Faichney et al. 1989). Ruminating time was recorded during a 24 h observation period prior to the sampling period for digesta pool and flow measurements.



Relationship between ruminating efficiency and intake of chopped (□) or ground and pelleted (■) lucerne hay. Equation to the line is  $y = 6.28 + 27.3x - 5.95x^2$ ,  $\text{rsd} = 1.019$ ,  $R^2(\text{adj}) = 0.977$ .

As expected, ruminating efficiency increased with intake ( $P < 0.001$ ). However, there was no difference between the relationships for chopped or ground and pelleted hay ( $P > 0.29$ ). Large particle DM apparently fermented, i.e., leaving the rumen pool other than by outflow or comminution, was related linearly to large particle DM entering the rumen; the coefficients, which estimate extent of fermentation in the large particle pool, were 0.527 for the chopped hay ( $r^2 = 0.995$ ) and 0.562 for the ground hay ( $r^2 = 0.997$ ). Although grinding substantially reduced ruminating time, the data show that it did not affect ruminating efficiency.

FAICHNEY, G.J. (1983). *Proc. Nutr. Soc. Aust.* 8: 186.

FAICHNEY, G.J. (1986). In 'Control of Digestion and Metabolism in Ruminants', p.173, eds L.P. Milligan, W.L. Grovum and A. Dobson. (Prentice Hall: New Jersey, USA).

FAICHNEY, G.J., PONCET, C. and BOSTON, R.C. (1989). *Reprod. Nutr. Dev.* 29: 325.

RUCKEBUSCH, Y. (1988). In 'The Ruminant Animal', p.64, ed. D.C. Church. (Prentice Hall: New Jersey, USA).

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