

INFLUENCE OF TYPE AND TIMING OF PROTEIN FEEDING ON WOOL GROWTH AND STAPLE STRENGTH IN YOUNG SHEEP

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Feeding protein supplements that are partially protected from degradation in the rumen increased wool growth in young sheep (Masters *et al.* 1998). While such supplements are expensive, there is evidence that the benefits continue after the feeding has stopped (Masters and Mata 1996). If this is so, feeding high quality protein supplements for short periods alternated with cheaper 'traditional' supplements may increase wool growth as much as continuous feeding but at a lower cost. In this experiment we compared diets containing lupin seed (degradable protein) with expeller canola meal (partially protected protein) each fed continuously or in rotation with a diet containing oats and barley.

Fifty six, 5-month-old Merino weaners with an average liveweight of 25.7 kg were used in a 2x2 factorial experiment. They were housed, fed a uniform quantity (DM) of diet daily and lost liveweight at 36 g/day. Half of the weaners were fed a diet containing (g/kg DM) canola meal (253), hay (714), urea (10) and minerals (23). The other half were fed the same diet but with lupin seed replacing the canola meal. Within each dietary treatment and in each of two months, one half of the weaners were fed the diet continuously, the other half were fed the diet for two weeks followed by two weeks of a diet containing (g/kg DM) barley (100), oats (370), hay (497), urea (10) and minerals (23). The crude protein (g/kg DM) in the diets containing canola meal, lupins and oats/barley was 155, 151 and 99 respectively and all diets had an estimated metabolisable energy concentration of 9.6 MJ/kg DM. Wool was clipped from a midside patch (approximately 100 cm²), scoured in detergent and clean wool growth calculated. At the end of the experiment, the weaners were fed the lupin based diet *ad libitum* for one month and then returned to the paddock and grazed together until shearing 76 days later. Midside samples of the fleece were collected for measurement of staple strength and fibre diameter.

Table 1. Effect of protein source and feeding pattern on clean wool growth (CWG, g/100 cm²/day) during the experiment, total clean wool growth during and after the experiment (TWG, kg), staple strength (SS, N/ktex) and average fibre diameter (FD, µm)

Protein	Feeding	CWG	TWG	SS	FD
Canola meal	Continuous	0.061	0.79	29.8	19.4
	Alternating	0.060	0.78	35.4	18.9
Lupins	Continuous	0.054	0.75	31.4	19.0
	Alternating	0.057	0.77	34.2	18.4
Standard error of all means		0.002	0.02	2.3	0.37
Significance level ^A	Protein	< 0.05	= 0.13	= 0.94	= 0.21
	Feeding	= 0.75	= 0.70	= 0.07	= 0.16

^A All interactions P > 0.30

Weaners fed canola meal grew 11% more wool during the experimental period than weaners fed lupins. This increased wool growth did not result in any increase in staple strength. The response to canola meal was the same whether feeding was continuous or alternated with oats/barley.

The results indicate that feeding proteins partially protected from degradation in the rumen may increase rates of wool growth even if the supplements are not fed continuously. However, in this experiment responses to canola meal were small and did not result in any significant changes in fleece weights or staple strength. Therefore, further investigation using protein supplements that give higher responses in wool growth are required to fully evaluate the potential application of these results.

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