

EFFECTS OF BARLEY AND LUPIN SUPPLEMENTATION ON MILK COMPOSITION
AND PLASMA METABOLITES IN LACTATING EWES

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The beneficial use of high energy grain supplements for lactating ruminants is well known. The production of sheep's milk for human consumption is increasing in Australia but little is known about feeding regimes for the production of high quality cheese. The aim of this study was to determine whether the feeding of barley or lupin grain to lactating ewes altered those constituents of milk known to affect cheese quality.

Ten crossbred (Border Leicester x Merino) ewes were housed in metabolism cages and milked twice daily at 0730 and 1600 hours. Five ewes were fed chopped lucerne:rolled barley grain (60:40 L/B) and five ewes fed chopped lucerne:lupin grain (60:40 L/LU). Diets were fed twice daily to meet calculated metabolisable energy (ME) requirements (MAFF 1975). ME offered for L/B and L/LU diets was 23.0 MJ/d. Sheep were accustomed to each diet for 12 days followed by an experimental period of 10 days. Milk samples were collected on alternate days and blood sampling (via polyvinyl catheter, jugular vein) on day 4 and day 10 of experimental period. Dry matter intakes were measured daily and apparent digestibility over days 2 to 5. The results are summarised in the table.

	L/B	L/LU		L/B	L/LU
Dry matter intake (g/d)	2073	2077	Acetate (mM)	1.36	1.32
Crude prot. intake (g/d)	331	530***	Propionate (mM)	0.04	0.05
Apparent dry matter digestibility (%)	66.5	72.2***	Glucose (mg/100 ml)	71.3	75.6**
Mean liveweight (kg)	66.2	65.6	α -amino N (mg/100 ml)	0.30	0.32*
Milk yield (g/d)	1094	1117	FFA (μ mol/l)	130	128
Milk fat yield (g/d)	50.8	58.2**			
Milk prot. yield (g/d)	51.3	58.7**	* P<0.1		
			** P<0.05		
			*** P<0.01		

It is evident that lupin compared to barley supplementation resulted in significant changes in milk composition. The increased crude protein intake with lupin grain was accompanied by increases in milk protein yield and free amino-N in plasma. It is interesting that digestibility of barley was significantly lower than lupin despite a similar dry matter intake at the same level of ME offered. It has been suggested (Rowe et al. 1987) that barley supplementation reduced digestibility and utilization of energy provided by the diet. Further studies aim to examine whether changes in milk composition resulting from grain supplementation alter cheese quality.

MAFF (1975). Technical Bulletin No.33, London: HMSO.

ROWE, J.B. and AITCHISON, E.M. (1987). Herbivore Nutrition Research Occ. publ. A.S.A.P., p.185.

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