

BLOOD MEAL AS A PROTEIN SUPPLEMENT FOR DAIRY COWS

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Replacing part of the lupin grain in a barley/lupin grain concentrate mixture with blood meal, as a source of rumen undegradable dietary protein (UDP), increased milk and milk protein yield in high producing dairy cows in early lactation fed poor quality pasture silage (Valentine and Bartsch 1995). However, the production response by dairy cows to UDP supplements may depend on the quality and type of roughage (Thomas and Rae 1988). Two experiments were carried out to compare milk production by high producing cows fed iso-nitrogenous concentrate mixtures of either barley and lupins or barley, lupins and blood meal as supplements to high quality pasture silage or hay diets.

Twenty-six Holstein-Friesian cows in experiment 1 and 32 cows in experiment 2, all in early lactation, were allocated to groups of 2 based on similarity in calving date and milk fat yield recorded during a 7-day covariance period. In experiment 1, cows within each group were allocated at random to be fed 9 kg/day of iso-nitrogenous rolled grain mixtures comprising either 50% barley and 50% lupins (11.3 MJ ME/kg DM, 22.3% CP) or 70% barley, 24% lupins and 6% blood meal (11.6 MJ ME/kg DM, 22.3% CP). In experiment 2, the cows received 9 kg/day of iso-nitrogenous grain mixtures comprising either 34% barley and 66% lupins (11.2 MJ ME/kg DM, 25.2 % CP) or 54% barley, 40% lupins and 6% blood meal (11.5 MJ ME/kg DM, 25.2 % CP). The grain mixtures were fed with a mineral/vitamin supplement in equal amounts twice daily at milking for a 7-day adaptation period and 56-day test period. Cows within each experiment were managed as a single herd. Wilted, round bale pasture silage (8.7 MJ ME/kg DM, 14.9% CP) was available *ad libitum* in experiment 1 and round bale pasture hay (10.0 MJ ME/kg DM, 18.2% CP) in experiment 2. Milk yield and composition were recorded 3 times each week and liveweight once each week.

Table 1. Covariance-corrected mean daily yields of milk and milk components, milk composition and liveweight change of cows fed lupins or a mixture of lupins and blood meal

	Experiment 1			Experiment 2		
	Lupins	Lupins/ blood meal	SED	Lupins	Lupins/ blood meal	SED
Milk yield (L)	28.8	27.6	1.0	30.8	30.8	0.8
Fat yield (kg)	1.16	1.13	0.05	1.20	1.22	0.03
Protein yield (kg)	0.82	0.78	0.03	0.87	0.88	0.02
Fat content (g/kg)	40.8	40.8	0.8	39.3	39.7	1.0
Protein content (g/kg)	28.6	28.3	0.3	28.6	28.6	0.4
Liveweight change (kg/day)	0.3	0.2	0.1	-0.1	0	0.1

Mean intakes (kg/day) of the barley/lupin (9.0) and barley/lupin/blood meal (8.3) concentrate mixtures were significantly ($P < 0.05$) different in experiment 1, but not in experiment 2 (8.8 vs. 8.5). In both experiments there were no significant differences between treatments in milk production, milk composition or liveweight change (Table 1).

Using blood meal as a source of UDP in rations based on a barley/lupin grain concentrate mixture and high quality silage or hay is unlikely to increase production in dairy cows producing around 30 L/day in early lactation.

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THOMAS, C. and RAE, R.C. (1988). "Nutrition and Lactation in the Dairy Cow." pp. 327-54. (Butterworths: London).