THE EFFECT OF FEEDING FISHMEAL ON THE PRODUCTION OF DAIRY CATTLE FED SILAGE AND OFFERED A SUPPLEMENT OF BARLEY OR LUPIN

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Previous work (Hough, unpublished) found that when lupins compared to barley was offered to dairy cattle fed a silage based diet there was no significant difference in milk production. Up to 85% of the total nitrogen of silage may be in the form of non-protein nitrogen (Muck, 1987), thus when lupins, which contain a large proportion of rumen degradable protein (RDP) are offered large amounts of ammonia may be absorbed across the rumen and excreted in urine. An alternative to feeding lupins would be to provide a supplement of rumen undegradable protein (UDP). This trial was designed to examine the effect of including fishmeal as a source of UDP in silage based rations for dairy cattle in early lactation.

Forty Holstein-Friesian cattle (32 heifers and 8 cows) were offered pasture silage (ME; 9.2MJ/kg DM, CP;14.5%) ad libitum plus 6kg/day of a barley/lupin mix after calving. Milk production and composition, and live weight were recorded 14-17 days post-partum and cattle were allocated to one of four treatments; barley (B), lupins (L), barley plus fishmeal (BF) and lupins plus fishmeal (LF) for 98 days. Barley was offered at 6kg/day and all other rations were iso-energetic. Fishmeal was included at 500g per day in the relevant diets. Milk production and composition were recorded twice weekly and cattle were weighed weekly for the duration of the trial. Silage intakes were measured on a group basis twice during the trial. Milk yield, and composition and live weight gain are shown below.

	Treatment				SEM	Significance	
	B	BF	L	LF		GxF	BxL
Milk yield (kg/d)	22.8	24.5	24.5	25.7	0.53	NS	NS
Fat content (g/kg)	37.4	37.0	38.2	38.2	0.58	NS	NS
Protein content (g/kg)	27.8	29.1	27.3	28.5	0.24	***	NS
Fat yield (kg/d)	0.86	0.91	0.93	0.99	0.02	NS	*
Protein yield (kg/d)	0.63	0.72	0.67	0.73	0.01	***	NS
Live weight gain (kg)	4.8	21.7	13.1	20.1	0.50	NS	NS

NS not significant, *P<0.05, ***P<0.001
GxF = Grain with and without fishmeal ; BxL = Barley vs Lupin diets

As the protein content of the total diet (B; 13.8, BF; 15.1, L;18.4, LF;19.4% CP) increased, dry matter intake (B;14.6, BF;15.1, L;15.7, LF;15.4kgDM/day) and milk yield also increased. The addition of fishmeal increased milk yield by 1.4kg/day but this was not significant (P=0.07). Protein content and yield were increased (P<0.001) but fat parameters were not altered by the addition of fishmeal. Although not significant live weight gains tended to be higher when fishmeal was included in the diet. The replacement of barley with lupins did not increase milk production although there was an increase in fat yield (P<0.05).

The trends observed in this trial are similar to those reported by Hussein and Jordan (1991); when fishmeal is used in-conjunction with poor or medium quality silage the production responses are higher than if a RDP supplement had been fed.

Fishmeal as a source of UDP has the potential to increase production when fed with silage, however the levels used in this trial may not be economical and further work is required to determine ideal levels of inclusion into such diets.

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