IAFMM Fish Meal Flyer

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USE OF FISH MEAL TO REDUCE COMPOUND FEED USAGE IN HIGH YIELDING DAIRY HERDS - RESULTS FROM THIRD PARTICIPATING FARM

SUMMARY

Results of a trial to evaluate the use of fish meal to reduce compound feed usage in high yielding dairy herds have now been obtained from a third commercial dairy herd in the U.K.

Substituting 0.67kg fish meal plus 1.25kg sugarbeet pulp for 4kg of 'concentrate', milk yield and composition was maintained. This confirms the results from the other two herds.

INTRODUCTION

This trial programme was initiated to evaluate whether milk yields could be maintained while reducing concentrate feed intake and including fish meal in the diet. Fish meal (approximately 0.75kg) and sugarbeet pulp (approximately 1.25kg) were to be substituted for 4kg of concentrate. The trial was to be carried out with several high yielding commercial dairy herds in the U.K. Results from the first two farms have already been reported (see appendix 1) and showed that milk and composition was maintained, despite the reduction in concentrate feeding. Results from the third farm are given below :

Methods

The normal farm ration consisted of average quality grass silage ad lib supplemented with 3kg wheat, 2.5kg molasses, 1kg soyabean meal, 3.5kg sugarbeet pulp, 4kg maize gluten feed and 0.5kg of an animal protein blend. Those cows producing over 20 litres of milk per day received, in addition, 0.33kg of compound dairy feed for each litre of milk over 20 litres. The treatment diet involved the substitution of 0.67kg fish meal selected for ruminants and 1.25kg sugarbeet pulp for 1kg wheat, plus 2kg maize gluten feed, plus 1kg commercial compound dairy feed (A)

in the normal farm ration . Cows on treatment B received the normal farm ration

Two groups of Holstein x Friesian cows (37 and 36) received the treatments over four periods, each of four weeks, according to the sequence ABAB or BABA respectively.

Results

Milk yields in the last week of each period are given in Table 1. The fat and protein content of this milk are given in Table 2. There was no difference between treatments in either the yield of milk or its content of fat or protein.

Conclusion

Including fish meal and sugarbeet pulp in the diet of dairy cows enabled concentrate feeding to be reduced, maintaining milk yield and composition. It is believed that utilisation of forage was improved.

This result is similar to that found on the first two farms, thereby extending the variety of farming conditions under which this result has been obtained.

TABLE 1

MILK YIELD

FARM 3

Sequence	ABAB	BABA
No. cows	37	36
Milk yield in the last week of each period (ℓ/day) :		
Period 1	28.4	28.5
Period 2	23.8	25.0
Period 3	20.7	22.2
Period 4	16.7	17.1
Effect of fish meal - sugarbeet pulp compared with normal commercial ration (ℓ/day)	-0.11	
Standard error of effect	±0.17	
Significance	N.S.	

TABLE 2

MILK COMPOSITION

FARM 3

	% Fat		% Protein	
Sequence	ABAB	BABA	ABAB	BABA
Period 1	3.53	3.75	3.30	3.28
Period 2	4.00	3.80	3.41	3.32
Period 3	4.06	3.79	3.49	3.41
Period 4	4.21	3.95	3.33	3.35
Effect of fish meal-sugarbeet pulp	-0.036		+0.003	
Standard error of effect	±0.043		±0.0135	
Significance	N.S.		N.S.	

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USE OF FISH MEAL TO REDUCE COMPOUND FEED USAGE IN HIGH YIELDING DAIRY HERDS

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Introduction

Compound feeds are frequently used at a fixed rate of 0.36kg to 0.40kg/kg milk produced, in addition to forage and other home-grown feeds. Such linear scales take no account of the curvilinear response of milk yield to concentrate feed intake, nor of the substitution effect of concentrate feed upon forage intake. In high-yielding herds, the use of fixed rate scales can result in the provision of concentrate feeds in excess of 10kg/d. An experiment was designed to evaluate whether milk yields could be maintained while reducing concentrate feed intake, and therefore placing greater reliance on forage intake, and including sugar-beet pulp as a source of highly digestible but non-starchy concentrate, and fish meal as a source of high quality undegraded dietary protein

Methods

A cubed mixture (2kg) consisting of 0.75kg of fish meal (selected for low degradability) and 1.25kg molassed sugarbeet pulp (A) was substituted for 4kg of 'concentrate' (B) per cow per day on two commercial farms. On each farm two groups of multiparous cows in early lactation received the two treatments for four periods, each of four weeks, according to sequence ABAB or BABA. Milk yields were recorded for 24h each week and milk was sampled by MMB at the end of the fourth week of each period. Milk yields in the last two weeks of each period were statistically analysed.

Farm 1 fed grass silage ad lib (Mean ±SE,C.P. 117±7.2g/kg D.M.;ME 9.2±0.10MJ/kg D.M.) with 9kg ensiled brewers grains, 4kg sugar-beet pulp, 3kg maize gluten feed and commercial compound (C.P.223±4.4;ME13.5 ±0.14) at 0.4kg/kg milk above 24kg milk/d. The commercial compound was examined under a feed microscope and found to contain rapeseed meal, wheat, maize gluten, soyabean meal, with trace quantities of linseed meal, fish meal and meat and bone meal. In treatment A 1kg maize gluten feed and 3kg commercial compound were replaced. Farm 2 fed grass silage ad lib. (C.P.179±17.8; ME 10.0±0.33), 3.2kg sugar-beet pulp, 3.2kg low energy compound nut and a different commercial compound nut (C.P.204±1.9 ME 11.4±0.08) at 0.4kg/kg milk above 13.6kg milk/d. The commercial compound nut was examined under the feed microscope and found to contain wheat, barley, maize gluten meal, palm kernel meal, soyabean meal, rapeseed meal and meat and bone meal. In treatment A 4kg commercial compound nut were replaced.

Results

Milk yields immediately prior to commencing the trial and in the succeeding four periods, together with the effect of replacing 4kg concentrate by 2kg fish meal–sugar-beet pulp nut are given in Table 1.

TABLE 1

Effect of feeding 2kg of fishmeal–beet pulp cube (A) in place of 4kg of 'concentrate' feed on milk yield (kg/day) during the last two weeks of four periods, each of four weeks, according to sequence ABAB or BABA

	Farm 1		Farm 2	
Sequence	ABAB	BABA	ABAB	BABA
No. of cows	19	12	13	10
Days calved at start	44.0	25.8	39.1	32.1
Pre-trial milk yield	44.2	38.8	29.3	30.3
Period 1	44.6	44.3	30.7	30.7
Period 2	42.0	44.8	25.8	26.7
Period 3	40.8	42.5	26.9	25.3
Period 4	39.3	41.0	22.4	26.0
Effect of fish meal–sugar-beet pulp	+0.63		+1.39	
Standard error of effect	±0.408		±0.369	
Significance	N.S.		P<0.01	

Mean milk yields (kg/d) over the four periods were : Farm 1, 42.2; Farm 2, 26.8. On both farms reducing concentrate intake did not result in any reduction in milk yield. Indeed, on Farm 2 milk yield was significantly increased (P<0.01).

Milk fat content immediately prior to commencing the trial and at the end of each of the succeeding four periods, together with the effect of replacing 4kg concentrate by 2kg fish meal-beet pulp nut are given in Table 2.

TABLE 2

Effect of feeding 2kg of fishmeal-beet pulp cube (A) in place of 4kg of 'concentrate' feed on fat content (g/kg) during the last two weeks of four periods, each of four weeks, according to sequence ABAB or BABA

	Farm 1		Farm 2	
Sequence	ABAB	BABA	ABAB	BABA
No. of cows	19	12	13	10
Days calved at start	44.0	25.8	39.1	32.1
Pre-trial milk fat	36.7	39.5	37.7	35.7
Period 1	34.8	35.2	35.4	37.3
Period 2	35.4	36.7	40.1	31.8
Period 3	38.2	38.8	37.2	35.7
Period 4	38.8	37.5	38.7	37.9
Effect of fish meal-sugar-beet pulp	+0.03		-1.9	
Standard error of effect	±0.514		±0.57	
Significance	N.S.		P<0.01	

Mean milk fat content over the four periods were: Farm 1, 37.0; Farm 2, 36.9. On Farm 1 there was no change in milk fat content or milk fat yield. On Farm 2 there was a significant reduction (P<0.01) in milk fat content, but when account is taken of the increased milk yield there was no change in milk fat yield.

Conclusion

The results suggest that including fish meal with sugar-beet pulp and reducing intake of 'concentrate' has resulted in better utilisation of forage, as milk yield was not depressed. It is possible that forage intake was increased, though this was not measured on the two commercial farms taking part in the trial.