IAFMM FISH MEAL FLYER

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NO.A - March 1985

Strictly confidential - not for circulation
Project No: A84.1.6

EVALUATION OF FISH MEAL FED TO BEEF CATTLE IN WEST GERMANY

Objective of the project: 30 trials have now been reported world-wide showing benefits (with one exception) when fish meal was fed to beef cattle. Of these trials, only one was undertaken using maize-silage as the main source of feed energy (1) the majority used grass-silage. In West Germany, a commercial farm near Oldenberg was chosen for a practical trial with beef cattle fed maize silage as the main source of forage, to measure the response of the cattle to a supplement of fish meal in the diet. Bulls of liveweight 250kg to 300 kg were to have been used, but due to a delay in the trial start, due to a disease problem, animals were heavier than intended.

Summary of trial design: Six pens of cattle, each with 5/6 bulls, of liveweight of approximately 430kg each were used. Three pens were allocated to the fish meal treatment and three to the normal farm diet. The treatment pens were randomly allocated throughout the barn. The normal farm diet consisted of 2kg compound feed daily per bull plus maize-silage, the latter was freely available (ad lib). The compound feed contained 21.9% protein, 4.2% fat, 7.7% fibre, 9.5% ash and 45.1% nitrogen-free-extractives (NFE). The starch equivalent (energy) was calculated to be 680. The maize-silage contained (on a wet weight basis) 31.5% dry matter, 2.7% protein, 7.5% fibre, 6.3% starch, and the starch equivalent (energy) was calculated to be 200. The calculated metabolisable energy values of the concentrate and the maize silage were 13:1 MJ and 11.0 MJ per kg dry-matter respectively.

For the fish meal treatment 250g of Chilean fish meal plus 250g sugar-beet pulp replaced 500g of the daily compound feed fed to the animals. The fish meal contained 66.5% protein and 6.5% fat. Analysis of the fish meal showed it to be suitable for ruminant feeding. The fish meal/sugar beet pulp pellet contained 31.0% protein, 4.6% fat, 8.3% fibre, 12.0% ash and 33.3% NFE.

The feed treatments were continued for 100 days.

Results of trial: The average figures are given below:

Treatment	Number of animals	Initial weight (kg)(Avg.± S.D)	Final weight (kg)(Avg.± S.D)	Daily gain (kg)(Avg±SD)
Fish meal	13*	427 ± 30.9	529 ± 45.1	1.02 ± 0.189
Control	18	433 ± 35.6	536 ± 42.4	1.03 ± 0.168

* 2 animals (numbers 1 and 10) were excluded from these figures because they were statistically identified as outliers. Their daily gains were 0.12kg and 0.54kg respectively.

Discussion and Conclusion: In this practical on-farm trial no difference in the growth of the bulls over 100 days occurred between the fish meal fed bulls and those receiving the normal farm diet. This result is in contrast with several published results with bulls of similar weight showing a positive response to fish meal (2,3,4). However, all these published experiments used low energy forage (eg grass-silage, grass-hay, alkali-treated straw). In the present experiment the maize silage used as forage had a higher energy value than grass silage (approximately 11 MJ against 10 MJ/kg d.m. for grass silage). It also contained 20% starch on a dry-matter basis. Consequently total daily energy intake, estimated at 123 MJ was higher than requirements (90 MJ). This high energy diet would be expected to give rise to microbial protein production in excess of the protein requirements of bulls in the final stages of fattening. Thus, the energy and protein demand of these heavier bulls appears to have been completely met by the maize-silage and normal farm compound feed. Lighter younger bulls might have found this dietary regime inadequate for maximum growth rate, and might have responded positively to fish meal.

Possible further action: To conduct a further trial in West Germany with younger lighter bulls receiving maize-silage to compare compound feeds with and without fish meal.

References

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