IAFMM

Fish Meal Flyer

international association of fish meal manufacturers

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FISH MEAL OR SKIMMED MILK POWDER MORE SUITABLE THAN SOYABEAN MEAL FOR EARLY WEANED PIGS

Early weaned pigs (pigs weaned at five weeks of age, or younger) are very sensitive to the type of dietary protein fed. Because their immunoregulatory system is not able to distinguish fully between protein from harmful bacteria and feed proteins, adverse allergic reaction to some feed proteins is likely. Work at Bristol University by Professor Bourne and his colleagues has shown that cow's milk protein or fish meal give a lower adverse allergic response than soya protein. This may partly explain the superior weight gain of early weaned pigs receiving a diet based on skimmed milk and fish meal (Control-C) compared with either full fat soyabean meal (FFS), extracted soyabean plus soya oil (S+O) or fat extracted soyabean meal (S) in a trial at the Rowett Research Institute in Scotland :

Weight gain of early weaned pigs, given diets based on different proteins[1]

	C	FFS	S+O	S	S.E.
Starting weight	7.6	7.3	7.4	7.4	±0.2
Daily gain (g)					
25 to 39 days of age	484	375	361	351	±22.2
25 to 60 days of age	534	474	447	447	±33.3

[1] V.R. Fowler 'The Nutrition of Young Pigs' in Animal Production 1984, Vol. 38 Part 3, p. 525

Recent work in Denmark at the National Institute for Animal Science has compared fish meal and skimmed milk powder substituted for soyabean meal in diets for early weaned pigs.[2] Adding either skimmed milk powder (6% and 12%) or fish meal (6% and 12%) to replace soyabean meal improved growth. The increase in daily gain achieved from four to ten weeks of age was greater with fish meal than with dried skimmed milk at 6% and 12% inclusion (see figure 1 and table 1). Furthermore, the increase in growth rate was

greatest at 12% than 6% inclusion of either fish meal or skimmed milk powder. When fish meal and skimmed milk powder were used in combination there was no additional response over that obtained with fish meal alone.

Inclusion of fish meal into the diets improved conversion of dietary energy (Scandinavian Feed Units) into liveweight gain. No improvement was observed with skimmed milk powder, except when it was combined with fish meal (see table 1). However, the improvement obtained with combinations of fish meal and SMP, were not as great as those with fish meal alone. The Danish trials also demonstrated the importance of using fish meal of high quality in diets for young pigs.

CONCLUSION

High quality fish meal is an excellent source of protein in diets for early weaned pigs. It is superior to soyabean meal. Skimmed milk powder is also superior to soyabean meal. For early weaned pigs it is recommended that the soyabean meal content of the diet is kept to a minimum (below 5%). Fish meal and/or skimmed milk powder should be the main source(s) of protein from weaning to 10 weeks of age, with fish meal being superior to skimmed milk powder.

[2] Kjeldsen N.J., Danielsen V and Nielsen H.E. (1984). Fish meal and skimmed milk powder fed to weaned pigs. Newsletter No. 533 National Institute of Animal Science, DK-1958. Copenhagen

Table 1. Liveweight Gain and Feed Conversion of Piglets fed Various Dietary Levels of Fish Meal and Skim Milk Powder

Group	1	2	3	4	5	6	7	8	9
Fish meal %	0	6	12	0	6	12	0	6	12
Skim milk powder %	0	0	0	6	6	6	12	12	12
No. of pigs	24	24	24	24	24	24	24	24	24
Av.weight at kg:									
4 weeks	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
10 weeks	22.8	24.7	25.2	23.4	23.5	23.9	24.2	25.0	24.0
FUp per pig	34.0	36.3	36.5	34.5	35.5	35.3	37.2	37.0	35.4
Daily gain, g	371	418	428	387	387	397	406	425	400
FUp/kg gain	2.18	2.07	2.02	2.12	2.18	2.10	2.17	2.08	2.10

FUp - Scandinavian Feed Units for Pigs

Figure 1 Effect of Inclusion of Either Fish Meal or Skimmed Milk Powder in the Diet on Weight Gain of Early Weaned Pigs

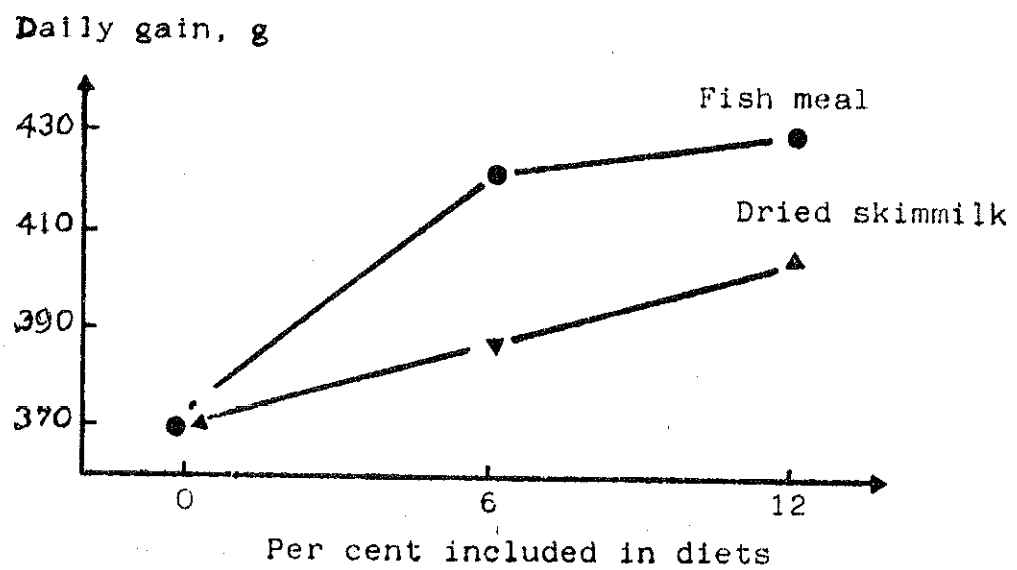

Figure 2. The effects of fish meal and dried skimmilk powder for piglets

Appendix Table 1

Composition of Experiments Diets in Danish Trial

Group	1	2	3	4	5	6	7	8	9
Ingredients									
Fish meal	0	6.0	12.0	0	6.0	12.0	0	6.0	13.0
Skim milk powder	0	0	0	6.0	6.0	6.0	12.0	12.0	12.0
Soyabean meal	33.2	23.1	12.5	29.2	18.6	8.3	24.8	14.4	4.1
Grain	53.2	57.9	63.1	51.4	56.6	61.5	50.0	54.9	59.9
Dried yeast	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lard	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minerals+vit.	3.6	3.0	2.4	3.4	2.8	2.2	3.2	2.7	2.0
Composition (determined)									
Dry matter, %	89.1	89.2	89.5	88.6	88.9	89.0	89.5	89.7	89.9
In diet dry matter									
Crude prot. %	25.5	26.9	27.4	27.0	28.0	27.7	27.3	26.6	27.8
Crude fat, %	7.3	8.0	8.1	7.4	7.5	7.9	7.4	7.5	7.8
Lysine, g/kg	13.6	14.8	15.0	14.2	16.0	16.2	14.6	16.7	17.1
Ca, g/kg	8.8	8.7	9.4	9.5	9.6	9.4	9.5	9.1	9.6
P, g/kg	8.3	8.9	9.3	8.8	9.0	9.0	8.8	8.7	9.2
FFA[1], g/kg	13.2	13.6	13.7	15.2	18.1	16.8	16.7	16.1	17.8
TVN[2], mg N/100g	28.6	33.7	37.9	32.9	34.8	39.6	30.7	34.6	39.6
FUp[3]/kg	1.16	1.17	1.18	1.15	1.17	1.19	1.19	1.18	1.20

[1] FFA - free fatty acids

[2] TNV - total volatile nitrogen

[3] FUp - Scandinavian Feed Units (pigs)

Protein and lysine requirements according to ARC (1981)[4] for these diets estimated to contain 14 MJ/kg :

Protein	200g per kg
Lysine	14g per kg

[4] Agricultural Research Council 'Nutrient Requirements of Pigs' 1981. CAB, Farnham Royal, U.K.