

Effect of total replacement of fish meal by poultry byproduct meal and meat and bone meal in started diets on performance of young pigs.

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Abstract

A total of 120 pigs (40 days old, 19 days post weaning) were utilized in a feeding trial (28 days) to compare the growth performance from diets formulated with 5% fish meal (FM), 6% meat and bone meal (MBM), or 4.8% poultry byproduct meal (PBM). Substitution of FM by MBM and PBM was on equal protein basis. All diets were formulated to similar specifications of ME, O CP, and digestible lysine, and digestible methionione plus cystine. Feeds were fed ad lib in meal form. Results indicated that protein source had no effect on weight gain, feed efficiency and incidence of diarrhea, although the relatively ranking of performance consistently was PBM, being the best and followed by MBM, and lastly FM. The present trial clearly showed that under Vietnamese farming condition, US MBM and PBM can totally replace FM in pig starters without any negative effect on growth, and yielding a 5-10% savings in feed cost.

	Protein Source		
	FM	MBM	PBM
<u>Formulation</u>			
FM	5	-	-
MBM	-	6	-
PBM	-	-	4.8
ME	3253	3257	3260
Protein%	19	19	19
Dig. Lysine %	1	.99	.99
<u>28 D performance</u>			
Avg. daily gain (g)	539	559	615
Feed/gain	1.73	1.65	1.58
Scouring %	8.7	7.3	6.5

Introduction

Vietnam is the 2nd largest pig producer in Asia, and the 10th in the world. However, a recent government survey indicated that Vietnam has the highest feed cost of pork production among Asian countries. The main difficulties are low self-sufficiency in protein and energy ingredients, and excessive tariff on imported commodities. One practical means of reducing pig starter cost is replacing high cost FM with alternative animal proteins such as US MBM and PBM. However, Vietnamese hog industry has no knowledge and experience of feeding MBM and PBM. Therefore, the purpose of the present trials is to demonstrate the feasibility of replacing FM with US MBM and PBM in starter diets as measured from weight gain, feed utilization and potential health problem.

Material and Methods

The trial was conducted at Research Farm, National Institute of Animal Husbandry in HCM city. A total of 120 crossbred pigs averaging 40 days of age and weighing about 11 kg were randomly allocated to three dietary treatments. Ten mixed sex pigs were placed for each pen and four pens were used for each treatment. Weight and feed consumption were measured weekly, and incidence of scouring was recorded daily.

Three starters were formulated (Table1) with diet containing 5% FM as control. Substitution of Fm by MBM and PBM was on an equal protein basis. All diet were formulated to have similar ME, CP, and digestible lysine, and digestible methionine plus cystine. Formulation was practical in reflecting the availability of local ingredients (e.g. rice, rice polishing, and cassava), but also meeting the special needs of young pigs (e.g. 3% milk powder, 1% digestible lysine etc). Diet nutrient analyses as shown in Table 1 are similar to that recommended in western countries. All diet were fed ad lib in meal form.

Results

Data of growth performance are listed in Table 2. although not statistically significant ($P>.05$), pigs fed PBM had best performance, and both PBM and MBM were better than FM control. Pigs fed PBM had 14% faster rate of gain, 8.7% advantage in feed conversion and 25% lower in incidence of scouring as compared with FM control. It is apparent that PBM was very well accepted by young pigs.

Data in Table 2 show that MBM was also well accepted by young pig, with a slight advantage over FM control in ADG (4%), F/C (5%), and incidence of scouring (17%). There was no mortality in any of the dietary treatment.

Discussion

According to the trial design, growth responses from all three diets should be similar. Reasons for apparent better performance of PBM or worse performance of Fm could be due to quality related factors (e.g. amino acids content and digestibility) which could not be estimated by crude protein analysis. Typical amino could content in FM, MBM, PBM, were used in formulation. Other quality issues associated with the freshness may also be accountable for the relatively poor performance of FM diet.

Substitution of FM with US PBM and MBM should result in 5-10% reduction in feed cost.

It is well known that performance in starter phase has a carry over effect into the grower / finisher phases. Use of US MBM and PBM in pig starter therefore could

benefit Vietnamese hog industry with multiple advantages. Results from the present study are consistent with similar trials conducted in China (1996,2004) and US (2000).

Conclusions

Under Vietnamese hog rising condition, US MBM and PBM can totally replace FM (5%) in starters without impairing the growth performance. This finding is consistent with results reported earlier from China and US. Substitution of FM with US MBM and PBM should reduce feed cost by 5-10% during the starter phase, and may yield multiple benefits for the entire grow out phase such as reduced days to market, and mortality.

Table 1 Experimental diets formulation and nutrient analysis

	Protein Source		
	FM	MBM	PBM
<u>Raw Material (%) :</u>			
Corn	35	35	35
Rice	15	15	15
Cassava	5	5	5
Rice Polishing	12.07	10.82	11.12
Soybean Meal 44%	21.02	21.08	21.04
Milk Powder 40%	3	3	3
Fish meal 60%	5		
US MBM 50%		6	
US PBM 63%			4.8
Oyster Shell	0.44	0.04	0.51
MDCP 21	1.25	0.92	1.63
Palm oil	0.72	1.51	1.28
Salt	0.4	0.41	0.43
Mineral Premix	0.3	0.3	0.3
Vite E 50	0.005	0.005	0.005
Choline 60	0.09	0.09	0.09
L-Lysine	0.14	0.22	0.22
DL-methionine	0.05	0.1	0.07
L-Threonine		0.01	
Kemzyme/Bye	0.05	0.05	0.05
Acidifizer	0.3	0.3	0.3
Anti-mold	0.05	0.05	0.05
Antioxydant	0.01	0.01	0.01
Minerals	0.1	0.1	0.1
<u>Nutrient Analysis:</u>			
ME (Kcal/kg)	3253	3257	3260
Protein%	19	19.03	19.04
True Digestible			
Lysine%	1.0	.099	0.99
True digestible sulfur			
Amino acid %	0.58	0.57	0.57

Table 2. Growth performance of pigs fed diets containing FM, PBM or MBM

	Protein Source		
	FM	MBM	PBM
No. of pigs	40	40	40
Avg. initial wt (kg)*	11.35	11.34	11.19
Avg. daily gain (g)	539	559	615
Feed /gain	1.73	1.65	1.58
Feed intake (kg/do)	.932	.922	.972
Incidence of scouring (%)	8.7	7.3	6.5
Mortality (%)	0	0	0

Average age was 40 days, weaning at 21 days of age.