



FATS AND PROTEINS RESEARCH FOUNDATION, INC.

3150 DES PLAINES AVENUE • DES PLAINES, ILLINOIS 60018
(5 MINUTES FROM CHICAGO'S O'HARE AIRPORT)

TELEPHONE AREA CODE 312 827-0139

"THE DIRECTOR'S DIGEST
D. M. Doty
Technical Director

September 26, 1967

No. 39

MEAT AND BONE MEAL IN SWINE RATIONS

With grant support from FPRF, Professor R. J. Meade, Department of Animal Science, University of Minnesota, is studying the nutritional value of meat and bone meal in rations for growing pigs. His investigations are particularly concerned with correlating the composition of animal by-product meals prepared from different raw materials with actual feeding trial performance in practical rations for swine.

As expected, the starting raw material influenced greatly the composition of the protein meals (Table 1). Meal B, prepared from shop fat and bone was relatively high in ash, calcium and phosphorus, and low in protein. Also the high proportion of collagen in the product is indicated by the high level of proline and glycine and the relatively low percentages of leucine, isoleucine, lysine, tyrosine, phenylalanine and valine in the protein. In contrast, Meal D from raw materials containing a high proportion of fallen animals was high in fat and protein, low in ash, calcium and phosphorus and the protein included higher proportions of most of the essential amino acids.

In spite of these compositional differences, the performance of growing pigs on rations containing high proportions of these meals was quite satisfactory (Table 2). In these feeding tests the pigs (5 per pen) with an initial weight of 45 pounds were fed for 42 days. The control ration was essentially a 16% protein corn-soybean oil meal ration properly supplemented with vitamins, minerals and antibiotics. Diets for lots fed meat and bone meal contained no supplementary calcium or phosphorus.

It is significant that all four samples of meat and bone meal gave good performance when used to supply one-third of the supplementary protein. Meal D, which was the best of the four samples (based on chemical analysis) gave satisfactory gains and feed efficiency when used to supply one-half of the supplementary protein.

Although these data are preliminary and must be confirmed by more extensive investigations it is gratifying to note that these results are in complete agreement with those obtained by Professor A. J. Clawson, North Carolina Agricultural Experiment Station (see "The Director's Digest" No. 17, November 16, 1965).

Table 1. Composition of Meat Meals Prepared From Different Raw Materials

Sample:*	A	B	C	D
Moisture-%	5.1	4.6	5.4	4.3
Fat-%	10.4	6.0	8.9	14.2
Ash-%	26.7	38.4	26.4	19.4
Ca-%	9.5	14.0	10.1	6.5
P-%	4.3	6.5	4.8	3.1
Protein-%	51.1	47.2	52.5	57.3
Amino Acids (as % of Protein)				
Arginine	7.49	7.41	7.55	7.03
Histidine	1.72	1.71	1.93	2.00
Isoleucine	2.95	2.54	2.87	3.54
Leucine	6.20	5.16	6.13	6.50
Lysine	5.26	4.76	5.59	6.02
Methionine	1.43	1.40	1.53	2.09
Cystine	0.40	0.33	0.56	0.62
Phenylalanine	3.43	3.03	3.49	3.73
Tyrosine	2.53	1.67	2.55	2.94
Threonine	3.52	2.91	3.43	3.69
Valine	4.54	3.85	4.58	4.57
Glycine	14.44	16.21	14.62	11.69
Proline	9.03	9.75	9.08	7.42

* Sample A - From mixed raw materials.

Sample B - From shop fat and bones.

Sample C - From packinghouse offal and bones.

Sample D - From mixed raw materials with a high proportion of fallen animals.

Table 2. Performance of Pigs on 16% Protein Diets Containing Varying Amounts of Different Meat Meals

Ration	% in Ration		Av. Daily Gain-lbs.	Feed Gain
	SBOM	M&B Meal		
Control	19.0	--	1.73	2.73
	---	17.5	0.57	4.18
	9.2	9.2	1.76	2.98
M&B Meal A	12.4	6.2	1.54 ^{a/}	2.77
	---	19.5	0.11	11.35
	9.5	9.5	1.59	2.81
M&B Meal B	13.0	6.5	1.73	2.75
	---	17.5	0.60	4.06
	9.0	9.0	1.45	2.80
M&B Meal C	12.4	6.2	1.69	2.84
	---	17.5	1.03	2.78
	9.2	9.2	1.75	2.75
M&B Meal D ^{b/}	12.4	6.2	1.68	2.72

a/ Pen contained one "unthrifty" pig.

b/ Assumed to contain 50% protein; since it actually contained 57.3%, protein level in all lots slightly above 16%.