1963

Supplemental Lysine, Methionine, Fat and Fish meal in Swine Growing-Finishing Rations

R.W. Seerley
South Dakota State University

B.A. Eason
South Dakota State University

South Dakota State College
Animal Science Department Brookings, South Dakota
Agricultural Experiment Station
A. S. Mimeo Series 63-7

SUPPLEMENTAL LYSINE, METHIONINE, FAT AND FISH MEAL IN SWINE GROWING-FINISHING RATIONS

R. W. Seerley and B. A. Eason

Quality of supplemental protein in a ration for young pigs is an important consideration when formulating the ration. A good ration for young pigs should have an adequate supply of amino acids, and also the amount of amino acids should be in proper proportion to one another and to the other nutrients in the ration. Since rations formulated without animal protein are usually limiting in lysine and methionine, an addition of lysine and methionine may improve the ration. A previous trial (not published) indicated better pig performance with added lysine, methionine, and fat in the ration.

Fish flour, an animal protein source, contains a high percentage of lysine, methionine and other amino acids. This product may be a good source of limiting amino acids, other amino acids, and other nutrients.

The objectives of the following experiment were: (1) to study the influence of supplemental lysine, alone, on the performance of growing-finishing pigs, (2) to study the influence of supplemental lysine and methionine in combination on the performance of pigs, (3) to study the effect of the combination of lysine, methionine and fat on the performance of the growing-finishing pigs, (4) to see if fish flour improved the protein quality of a ration, when fish flour constituted a part of the protein supplement in the diet of a growing-finishing pig.

Experimental Procedure

Fifty weanling Duroc, Hampshire, Yorkshire and crossbred pigs were allotted into 10 pens on the basis of sex, weight, and general appearance.

The experimental treatments were:

Lot 1 and 1A	Basal ration
Lot 2 and 2A	Basal + 0.1% lysine
Lot 3 and 3A	Same as 2 and 2A + 0.1% methionine
Lot 4 and 4A	Same as 3 and 3A + 4% fat
Lot 5 and 5A	Basal + 2 1/2% fish flour

Castrated male pigs were in lots 1 to 5 and the female pigs were in the "A" lots. The pigs were raised in confinement and were fed by using self-feeders and were watered ad libitum.

The rations used in the experiment are presented in table 1.

Table 1. Composition of Rations[1]

Lots	1 & 1A	2 & 2A	3 & 3A	4 & 4A	5 & 5A
Ingredients	to 110 lbs.	to 110 lbs.	to 110 lbs.	to 110 lbs.	to 110 lbs.
Shelled corn, ground	1022	1022	1022	937	1064
Fat, stabilized	--	--	--	80	--
Oats, ground	600	600	600	600	600
Soybean meal	320	320	320	320	230
Fish flour	--	--	--	--	50
Dicalcium phosphate	20	20	20	20	20
Limestone	20	20	20	20	20
T.M. salt, hi zinc	10	10	10	10	10
Vitamin B mix, Merck 92	1	1	1	1	1
Vitamin B_{12} mix, Merck 20	0.5	0.5	0.5	0.5	0.5
Vitamin A and D, Quadrex 10	0.4	0.4	0.4	0.4	0.4
Tylan	4.0	4.0	4.0	4.0	4.0
Hygromix 8	1.5	1.5	1.5	1.5	1.5
Methionine (MHA)	--	--	2.0	2.0	--
Lysine	--	10.0	10.0	10.0	
Total lbs., ration	1999.4	2009.4	2011.4	2006.4	1999.4
Calculated analysis, % of ration					
Protein	14.42	14.35	14.35	13.96	14.19
Calcium	.71	.71	.71	.70	.83
Phosphorus	.52	.52	.52	.50	.57
Lysine	.64	.74	.74	.72	.73
Methionine	.30	.29	.39	.39	.33
Energy, calorie/lb.	919.78	912.13	912.13	982.43	936.90

[1] The rations listed were fed to approximately 110 lbs. body weight. After 110 lbs. the rations were formulated to have 13% crude protein. Corn and soybean meal were adjusted. Also 4 pounds of limestone were taken out of each ration.

Results and Discussion

Table 2 summarizes the results of the experiment. Barrows and gilts fed the ration supplemented with 0.1% lysine, alone, or fish flour gained faster than the control pigs. Average daily gains of all pigs fed the lysine ration and fish flour ration were 7% and 3.6% faster, respectively, than the control pigs. The combination of 0.1% lysine and 0.1% methionine in the ration did not consistently increase daily gains. Pigs fed the combination of lysine, methionine and 4% fat gained 2.4% slower than control-fed pigs.

Table 2. Response of Growing-Finishing Pigs to Various Supplements

Lot no.	1	2	3	4	5
Treatment	Basal	Same as 1 + .1% lysine	Same as 2 + .1% methionine	Same as 3 + 4% fat	2.5% fish flour
No. pigs					
Barrows	5	5	5	5	5
Gilts	5	5	5	5	5
Av. init. wt., lb.					
Barrows	34.2	33.0	34.8	34.6	30.6
Gilts	36.8	37.2	36.6	37.0	37.0
Av.	35.5	35.1	35.7	35.8	33.8
Av. final wt., lb.					
Barrows	201.6	209.4	207.2	196.2	203
Gilts	198.2	201.0	197.8	198.2	200
Av.	199.9	205.2	202.5	197.2	201.5
Length of expt., days					
Barrows	96	96	96	96	96
Gilts	102	96	104	104	100
Av.	99	96	100	100	98
Av. daily gain					
Barrows	1.74	1.84	1.80	1.68	1.80
Gilts	1.58	1.71	1.55	1.55	1.63
Av.	1.66	1.78	1.68	1.62	1.72
Feed cons., da.					
Barrows	5.50	5.76	5.60	4.93	5.52
Gilts	5.04	5.31	5.04	4.63	4.98
Av.	5.27	5.54	5.32	4.78	5.25
Feed/lb. gain, lb.					
Barrows	3.15	3.14	3.12	2.92	3.07
Gilts	3.18	3.11	3.25	2.99	3.06
Av.	3.16	3.12	3.18	2.96	3.06

Feed efficiency was improved by the addition of fat or fish flour to the ration. Previous research at this station has shown, as does this experiment, that fat improves the feed utilization of pigs. Possibly the better feed efficiency of pigs fed fish flour was due to a better balance of amino acids.

Summary

Fifty purebred and crossbred pigs, including different sexes, were fed five different treatments during the late spring and early summer.

The addition of 0.1% lysine improved the rate of gain in both barrow and gilt lots.

The addition of 4% fat to the ration containing supplemental lysine and methionine improved feed utilization when compared to the other lots.

The addition of fish flour to a ration similar to the ration used in the control lots slightly improved feed utilization and rate of gain when compared to the control pigs. This may be due to a more correct balance of essential amino acids in the pig's diet.