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Effect of Various Levels of Blood Meal in Swine Diets

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In a previous experiment reported in A.S. Series 75-50 it was shown that feeding diets containing up to 4% of ring dried blood meal did not significantly affect rate of gain, feed consumption or feed/gain. The level of 4% blood meal replaced about 6.6% of soybean meal in the diets. The economics of this substitution would depend on the relative prices of blood meal and soybean meal at a given time.

This experiment was conducted to obtain additional data on the value of ring dried blood meal in growing-finishing diets for swine and also to study levels of 4, 6 and 8% blood meal in the diet when added to replace an equivalent amount of protein supplied by soybean meal.

Experimental Procedure

Three replicate groups of 32 crossbred pigs averaging about 56 lb. were assigned to four subgroups of 8 pigs (4 barrows and 4 gilts) on the basis of weight, ancestry and sex within replicate. Each subgroup of 8 pigs was then randomly assigned to dietary treatment. Pigs were kept in partial or fully slatted floored pens, 5 feet by 15 feet, in an enclosed building. Diets were self-fed and pens were equipped with automatic waterers.

The composition of the experimental diets is shown in tables 1 and 2. Diets were changed to a lower protein level when the pigs averaged about 120 pounds. The four dietary treatments were as follows:

1. Corn-soybean meal diet
2. Four percent blood meal in diet
3. Six percent blood meal in diet
4. Eight percent blood meal in diet

Results

As shown in table 3, the daily gain was reduced during the growing period when pigs were fed diets containing 8% blood meal. These pigs gained 1.20 lb. daily compared to gains of 1.51, 1.53 and 1.54 for the other three treatment groups. Average daily feed consumption was also about 10% less for pigs fed the 8% blood meal diet and feed/gain was increased approximately 16%.

There were no significant differences among treatments during the finishing period when a 12% protein diet was fed. Only 5.5% blood meal was added to diets 3 and 4 during this period as that was the amount necessary of the high protein blood meal to formulate diets containing 12% protein. These two diets did not contain any soybean meal, but diet 4 was supplemented with

0.15% lysine. Actually, the blood meal analyzed over 80% protein on an as fed basis so the blood meal diets would have contained slightly more protein than calculated. There was no benefit of adding lysine to diet 4.

For the overall experimental period pigs fed the 8% blood meal diet gained about 0.2 lb. per day less than pigs in the other groups and required slightly more feed/gain. Pigs fed diets containing 4% or 6% blood meal gained 1.56 and 1.53 lb. per day, respectively, and required 2.98 and 2.96 lb. of feed/gain which was comparable to the 1.51 lb. daily gain and 3.08 feed/gain of pigs fed the corn-soybean meal control diet.

The reason for the poorer performance of pigs fed 8% blood meal during the growing period may have been due to a deficiency of isoleucine. Blood meal is low in this essential amino acid and by our analysis the diet contained 0.44% isoleucine. The National Research Council lists a requirement of 0.50% for pigs of this size. The possibility of a lysine shortage cannot definitely be ruled out. However, since there was no response to adding lysine to diet 4 during the finishing period and on the basis of performance of pigs fed diet 3 during this period, it would appear that the lysine in blood meal would have had to be at least 60% available. If one assumes at least 60% availability, a lysine shortage should not have existed in the growing period.

Summary

Ninety-six crossbred pigs were used in an experiment comparing diets containing 4, 6 or 8% ring dried blood meal fed to pigs from 56 lb. to market weight. Diets of 4 and 6% blood meal were equal to a corn-soybean meal diet as there were no significant differences in gain or feed/gain among these three treatments. Pigs fed diets of 8% blood meal gained significantly slower and required more feed during the growing period. There were no differences in performance when 0.15% supplemental lysine was added to diet 4 during the finishing period. Both diets 3 and 4 contained 5.5% blood meal which was the only supplemental source of protein in these diets.

Table 1. Composition of 15% Protein Diets Fed to 120 Pounds

Diet number	1	2	3	4
Blood meal, %	0	4	6	8
Ground yellow corn	79.45	82.25	83.55	84.95
Soybean meal, 44%	17.90	11.10	7.70	4.30
Blood meal	---	4.00	6.00	8.00
Dicalcium phosphate	1.20	1.30	1.40	1.40
Ground limestone	0.80	0.70	0.70	0.70
Trace mineral salt	0.50	0.50	0.50	0.50
Premix[a]	0.15	0.15	0.15	0.15

[a]Supplied per lb. of diet: vitamin A, 1500 IU; vitamin D, 150 IU; vitamin E, 5 IU; riboflavin, 1.25 mg; pantothenic acid, 5 mg; niacin, 10 mg; choline, 50 mg; vitamin B_{12}, 5 mcg and tylosin, 8 milligrams.

Table 2. Composition of 12% Protein Diets Fed From 120 to 210 Pounds

Diet number	1	2	3	4
Blood meal, %	0	4	6	8
Ground yellow corn	87.95	90.75	91.65	91.50
Soybean meal, 44%	9.30	2.50	---	---
Blood meal	---	4.00	5.50	5.50
Dicalcium phosphate	1.30	1.40	1.50	1.50
Ground limestone	0.80	0.70	0.70	0.70
Trace mineral salt	0.50	0.50	0.50	0.50
L-lysine	---	---	---	0.15
Premix[a]	0.15	0.15	0.15	0.15

[a]See footnote table 1.

Table 3. Performance of Pigs Fed Various Levels of Blood Meal

	Level of blood meal, %			
	0	4	6	8
Number of pigs[a]	24	24	24	24
Avg. initial wt., lb.	55.7	55.7	55.8	55.8
Avg. final wt., lb.[b]	212.4	217.8	214.0	196.0
Avg. daily gain, lb.				
55 to 120 lb.[c]	1.51	1.54	1.53	1.20
120 to 210 lb.[b]	1.51	1.59	1.52	1.42
55 to 210 lb.[b]	1.51	1.56	1.53	1.32
Avg. feed consumed/day, lb.				
55 to 120 lb.[c]	4.29	4.26	4.17	3.82
120 to 210 lb.[c]	4.98	5.01	4.82	4.50
55 to 210 lb.[c]	4.66	4.66	4.52	4.18
Feed/gain				
55 to 120 lb.	2.83	2.76	2.73	3.23
120 to 210 lb.	3.29	3.16	3.17	3.20
55 to 210 lb.	3.08	2.98	2.96	3.21

[a]Three replicates of 8 pigs each per treatment.
[b]Significant sex difference ($P<.05$).
[c]Significant treatment difference ($P<.05$).