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Richard C. Wahlstrom  
*South Dakota State University*

George W. Libal

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Opaque-2 Corn in Finishing Swine Diets

Richard C. Wahlstrom and George W. Libal

Opaque-2 corn contains approximately 50 to 100% more lysine and 50% more tryptophan than normal corn varieties. Since these two amino acids are the most deficient in normal corn-supplement rations, the use of opaque-2 corn in swine diets will reduce the amount of protein supplement needed. Previous research at South Dakota has shown that finishing pigs fed opaque-2 corn supplemented with lysine and threonine grew at a similar rate but required more feed/gain than pigs fed a 13% protein corn-soybean meal diet. The objective of this study was to determine the value of adding the amino acids lysine, isoleucine and threonine to opaque-2 corn diets for finishing swine.

Experimental Procedure

Ninety-six crossbred pigs having an initial average weight of approximately 125 lb. were allotted to 24 pens of four pigs each on the basis of ancestry, sex and weight. Four replicate pens were assigned to each of the following six treatments:

1. Opaque-2 corn
2. Opaque-2 corn plus .15% L-lysine
3. Opaque-2 corn plus .15% L-lysine and .10% L-isoleucine
4. Opaque-2 corn plus .15% L-lysine and .10% L-threonine
5. Opaque-2 corn plus .15% L-lysine, .10% L-isoleucine and .10% L-threonine
6. Normal corn-soybean meal diet.

The opaque-2 corn diet (diet 1) contained approximately .40% lysine and diets 2 to 6 were calculated to contain .55% lysine. The composition of the basal diet is shown in table 1. Pigs were housed in a slatted floor confinement house. The experiment was conducted for 8 weeks. The barrows were slaughtered and carcass data obtained.

Results

Growth performance and carcass data are summarized and presented in table 2. There were no significant differences among treatments in any of the parameters. However, average daily gains and feed/gain were best for pigs fed the corn-soybean meal diet. Supplementation of opaque-2 corn with the amino acids lysine, isoleucine or threonine did not result in any consistent improvement in daily gains, although feed efficiency was improved slightly when pigs were fed these supplemented diets. Rate of gain differed significantly between barrows and gilts with the barrows gaining at the faster rate.

Carcass backfat, length, loin eye area, percent ham and loin and percent lean were similar among treatments. There did appear to be a trend toward a larger loin eye area when pigs were fed opaque-2 corn diets supplemented with at least two amino acids. However, the numbers of animals in each group were too few for significance of differences of 10 to 20% in loin eye area (4.17 and 4.15 sq. in. for pigs fed diets 1 and 2 compared to 4.57, 5.10, 4.91 and 4.92 sq. in. for pigs on treatments 3, 4, 5 and 6, respectively).

#### Summary

Ninety-six crossbred pigs weighing 125 lb. initially were fed opaque-2 corn diets supplemented with minerals and vitamins and different amounts of supplemental amino acids. In this trial, there were no significant differences in performance or carcass characteristics due to supplemental amino acids. Pigs fed a 13% protein, corn-soybean meal diet had the best rate of gain and feed efficiency.

Table 1. Composition of Diets (Percent)

Ingredient	Opaque-2 corn	Normal corn-SBM
Opaque-2 corn <sup>a</sup>	97.70	--
Normal corn	--	86.80
Soybean meal, 44%	--	11.00
Dicalcium phosphate	.94	.78
Ground limestone	.78	.84
Trace mineralized salt	.50	.50
Premix <sup>b</sup>	.08	.08

<sup>a</sup> Amino acids supplemented for equal weight of corn in treatments 2, 3, 4 and 5.

<sup>b</sup> Provided per lb. of diet: vitamin A, 1500 IU; vitamin D, 150 IU; vitamin E, 2.5 IU; vitamin K, 1 mg; riboflavin, 1.25 mg; pantothenic acid, 5 mg; niacin, 8 mg; choline, 25 mg; vitamin B<sub>12</sub>, 5 mcg and chlortetracycline, 10 milligrams.

Table 2. Effect of Amino Acid Supplementation of Opaque-2 Corn for Finishing Pigs

Item	<u>Opaque-2</u>	<u>Opaque-2</u> + lysine	<u>Opaque-2</u> + lysine + isoleucine	<u>Opaque-2</u> + lysine + threonine	<u>Opaque-2</u> + lysine + isoleucine + threonine	Normal corn- SBM
Number of pigs <sup>a</sup>	16	14	16	16	13	16
Avg. initial wt., lb.	125.6	127.1	125.5	125.6	125.3	125.5
Avg. final wt., lb.	206.8	209.9	210.9	211.4	206.9	216.9
Avg. daily gain, lb. <sup>b</sup>	1.45	1.48	1.53	1.53	1.46	1.63
Avg. daily feed, lb.	6.13	6.00	5.74	5.97	5.85	6.02
Feed/gain, lb.	4.22	4.06	3.76	3.90	3.97	3.69
Carcass data						
Backfat, in.	1.27	1.24	1.20	1.24	1.23	1.29
Tenth rib fat, in.	1.31	1.20	1.13	1.12	1.09	1.30
Length, in.	30.6	30.9	31.0	30.6	30.4	30.6
Loin eye area, sq. in.	4.17	4.15	4.57	5.10	4.91	4.92
Ham and loin, %	40.3	41.3	39.7	41.6	40.9	40.9
Lean, %	50.6	51.3	53.8	55.0	54.5	52.8

<sup>a</sup> Four replicate groups per treatment.

<sup>b</sup> Significant sex difference (P<.005)