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1972

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### Recommended Citation

Libal, George W. and Wahlstrom, Richard C., "Opaque-2 Corn in Pig Starter Diets" (1972). *South Dakota Swine Field Day Proceedings and Research Reports, 1972*. Paper 11.  
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Opaque-2 Corn in Pig Starter Diets

George W. Libal and Richard C. Wahlstrom

Opaque-2 or "high lysine corn" has been shown to be an effective dietary ingredient for growing-finishing swine, allowing a reduction in the total protein needed in the diet and thus reducing the cost of the diet. The study reported herein was designed to evaluate opaque-2 corn in pig starter diets fed to pigs after weaning when amino acid needs of the pig are greatest.

Experimental Procedure

Eighty-four crossbred pigs averaging approximately 16 lb. were allotted to two replications of six treatments. The pigs were weaned at approximately four weeks of age and placed on test after a week's adjustment period. Each pen contained three barrows and four gilts. The length of the trial was five weeks (45 days). The pigs were housed in concrete floored pens.

The six experimental diets utilized were:

1. 14% normal corn-soy diet + 0.27% lysine
2. 18% normal corn-soy diet
3. 14% normal corn-soy diet + 0.41% lysine
4. 18% normal corn-soy diet + 0.14% lysine
5. 14% opaque-2 corn-soy diet + 0.26% lysine
6. 18% opaque-2 corn-soy diet

The composition and calculated nutrient content of the experimental diets are shown in table 1. Diets 1, 3 and 5 were equal in protein percent (14%) and diets 2, 4 and 6 each contained 18% protein. Diets 1 and 2 were equal in lysine percent (0.89%) but different from diets 3, 4, 5 and 6 which contained 1.03% lysine. Diets 3 and 4, respectively, differed from diets 5 and 6, respectively, only in proportion of lysine from natural and synthetic sources. Diets 3 and 4 contained normal corn (0.25% lysine), whereas diets 5 and 6 contained opaque-2 corn (0.45% lysine).

Results and Discussion

The growth pattern observed over the 5-week experimental period for the average of all pigs on all treatments is shown in figure 1. As is seen in most cases when pigs are weaned at an early age, the figure illustrates the delay of growth during the first week. Since the pigs received approximately a 1-week adjustment period before the start of the trial, it can be assumed that in this case the delay in growth was for nearly 2 weeks after weaning. After the initial delay, growth rate increased to as much as 8.5 lb. during a 1-week interval as shown in figure 2. Figure 3 shows the average feed consumed per day during weekly intervals. Feed consumption was 0.87 lb. per day the first week, increasing in a linear fashion to 3.16 lb. per day during the fifth week of the trial. These increases in feed consumption corresponded with increased

weekly gains until the fifth week, illustrating that the limiting factor for growth rate in the early weaned pig is the pig's desire and ability to consume more feed. Pigs weaned at 7 to 8 weeks of age that are more used to dry feed from a creep feeder or the sow's feeder often do not exhibit as marked a period of delay. However, in spite of this advantage for later weaned pigs, in most cases there is an economic advantage to early weaning pigs. The number of days for a pig to reach market weight was equal under either management system and early weaning of pigs allowed early breeding of the sow to maximize the number of litters she can produce over a given period of time.

Summary

Eighty-four crossbred pigs weighing approximately 16 lb. were used to study the effect of feeding normal corn and opaque-2 corn as well as supplemental lysine in starter diets containing 14 or 18% protein and 0.89 and 1.03% lysine. The results of the 5-week trial showed final weights of from 44 to 49 lb. and no significant differences in average daily gain, feed consumption or feed efficiency due to either protein or lysine levels.

Table 1. Composition of Experimental Diets and Calculated Nutrient Content

Ingredients	Diets					
	1	2	3	4	5	6
Normal corn	83.4	73.6	83.4	73.6	--	--
<u>Opaque-2</u> corn	--	--	--	--	83.4	73.6
Soybean meal (49%)	13.3	23.3	13.3	23.3	13.3	23.3
Dicalcium phosphate	2.0	1.8	2.0	1.8	2.0	1.8
Limestone	0.5	0.5	0.5	0.5	0.5	0.5
Trace mineral salt (1% zinc)	0.5	0.5	0.5	0.5	0.5	0.5
Vitamin-antibiotic premix <sup>a</sup>	0.3	0.3	0.3	0.3	0.3	0.3
L-lysine	0.54	--	0.82	0.28	0.52	--
Calculated protein, %	14.00	18.00	14.00	18.00	14.00	18.00
Calculated lysine, %	0.89	0.89	1.03	1.03	1.03	1.03

<sup>a</sup>Provided per pound of diet: 1.25 mg. riboflavin, 5 mg. pantothenic acid, 10 mg. niacin, 50 mg. choline, 7.5 mcg. vitamin B<sub>12</sub>, 274 I.U. vitamin D, 2,300 I.U. vitamin A, 50 mg. chlortetracycline, 25 mg. penicillin and 50 mg. sulfamethazine.

Table 2. Growth and Feed Data

	Diets					
	1	2	3	4	5	6
Number of pigs <sup>a</sup>	13	14	13	14	14	14
Initial weight, lb.	16.1	15.8	16.0	15.9	15.5	16.0
Final weight, lb.	43.6	45.8	45.5	49.2	45.6	47.0
Avg. daily gain, lb.	0.78	0.85	0.85	0.95	0.86	0.88
Feed consumption, lb.	2.09	1.99	2.10	2.18	2.26	2.19
Feed per lb. gain, lb.	2.67	2.33	2.48	2.29	2.64	2.47

<sup>a</sup>One pig was removed from diet 1 and one from diet 3 because of unrepresentative growth rates.

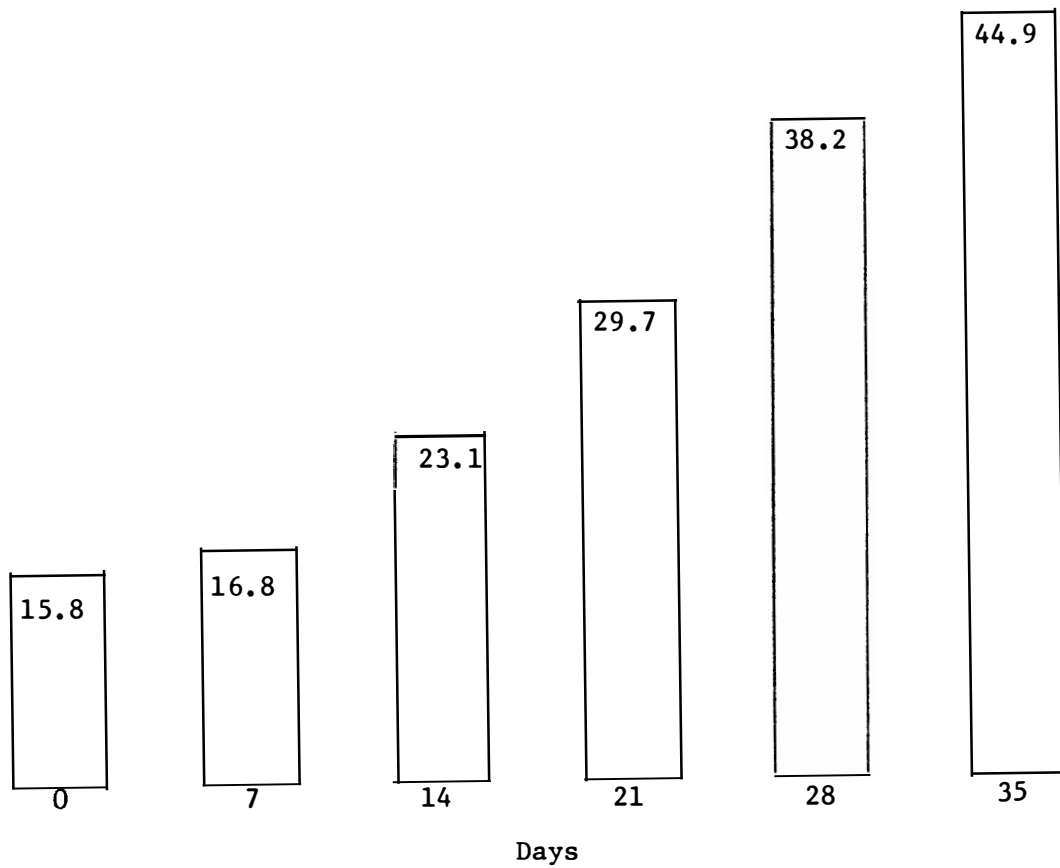


Figure 1. Avg. pig weight, lb.

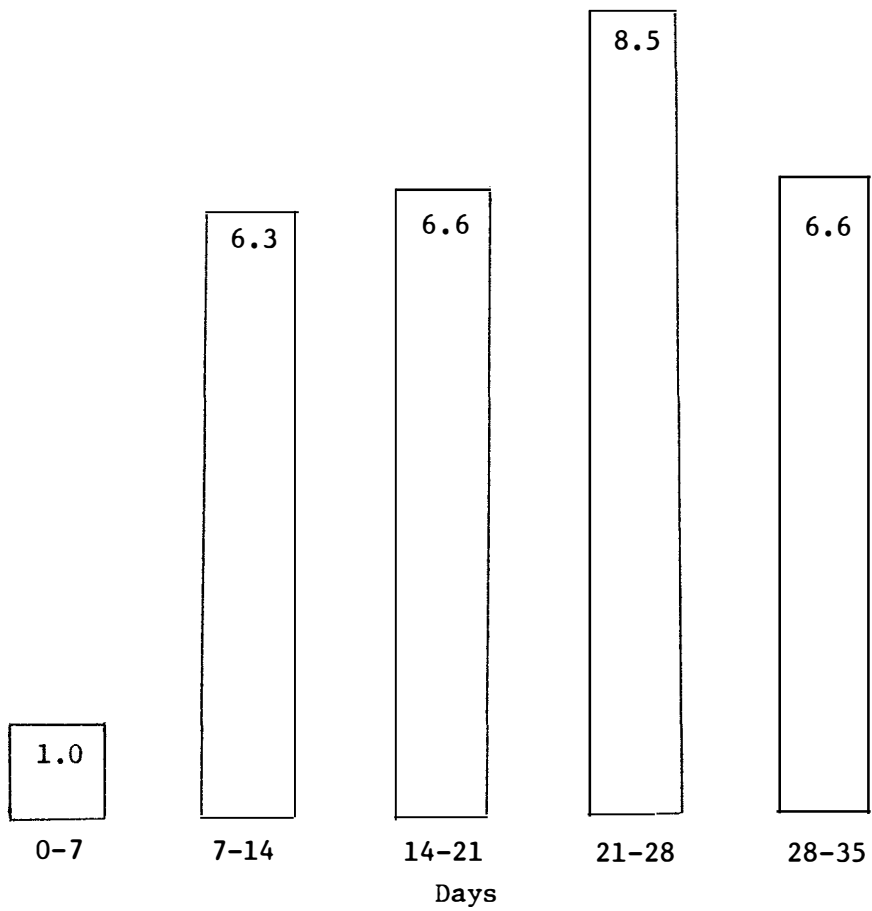


Figure 2. Avg. weekly gain, lb.

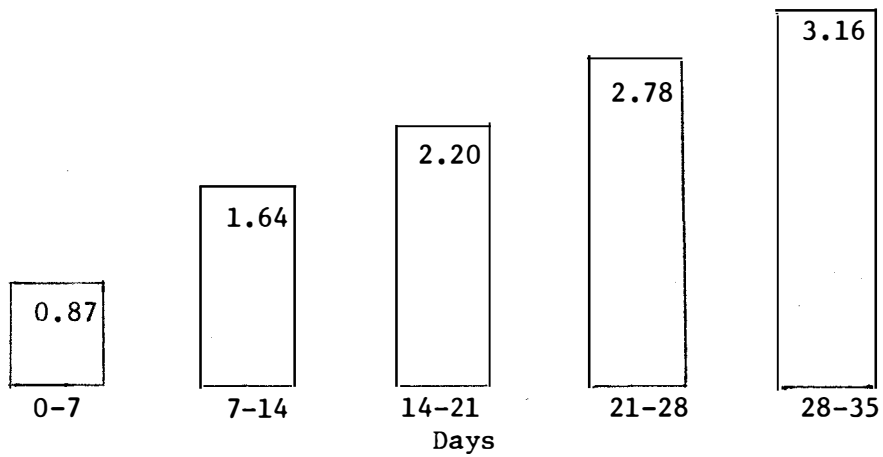


Figure 3. Avg. feed/day, lb.