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## Effect of Pen Space and Vitamin Level on Performance of Growing-Finishing Swine

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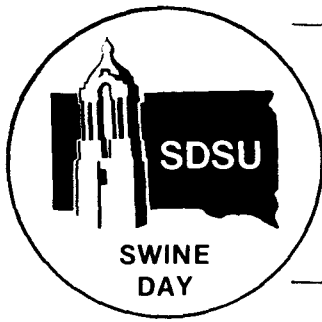
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EFFECT OF PEN SPACE AND VITAMIN LEVEL ON  
PERFORMANCE OF GROWING-FINISHING SWINE  
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Previous research at South Dakota State University has shown that pigs housed in a completely enclosed confinement building consume less feed and gain slower during the finishing period than pigs housed in an open-front facility. Boredom or building fatigue caused by prolonged confinement in a limited space have been suggested as possible causes of this reduced performance.

The experiment reported herein was conducted to obtain information on the effect of increasing pen space and/or doubling the level of vitamins in the diet during the finishing period from approximately 140 pounds to 220 pounds.

Experimental Procedure

Sixty-four crossbred pigs averaging 58 pounds were allotted to four replications of four treatments with four pigs per pen. Barrows and gilts were equalized among treatments, two replicates consisted of one barrow and three gilts per pen and two replicates were composed of two barrows and two gilts per pen. The pigs were housed in a completely slotted floor, enclosed confinement building. All treatments were the same until pigs averaged 140 pounds. The four treatments from approximately 140 to 220 pounds were:

- Treatment 1 -- Regular vitamin level with 7.1 square feet of pen space per pig.
- Treatment 2 -- Regular vitamin level with 14.2 square feet of pen space per pig.
- Treatment 3 -- Double level of vitamins with 7.1 square feet of pen space per pig.
- Treatment 4 -- Double level of vitamins with 14.2 square feet of pen space per pig.

Pigs were fed a 14% corn-soybean meal fortified diet for the complete experiment. The composition of the diet and the vitamin supplement are shown in table 1. Vitamin concentrations were doubled for treatments 3 and 4 from 140 to 220 pounds.

TABLE 1. COMPOSITION OF DIET

Ingredient	Percent
Ground yellow corn	82.0
Soybean meal, 44%	15.6
Dicalcium phosphate	1.2
Ground limestone	.7
Trace mineralized salt	.3
Premix <sup>a</sup>	.2

<sup>a</sup>To supply per pound: 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; selenium, .04 mg and aureomycin, 25 milligrams.

### Results

A summary of treatment effects on the performance of pigs during each period and for the entire experiment is presented in table 2 and the main effects of pen space and vitamin levels during the finishing period are shown in table 3. All pigs were treated the same during the first period from 58 to 140 pounds and performance did not differ significantly. Increasing pen space at 140 pounds appeared to be beneficial. Those pigs fed the regular vitamin level and given double the pen space from 140 to 220 pounds gained faster ( $P < .05$ ) than either of the groups that remained in the regular pens (7.1 square feet per pig). Also, they consumed more feed daily ( $P < .05$ ) than the other three treatment groups.

Daily gains from 140 to 220 pounds averaged 1.83 and 1.98 pounds for pigs having 7.1 or 14.2 square feet of pen space during this period. These differences were significant as was the difference in feed consumption. Pigs with more pen space consumed more daily feed during the finishing period. Performance was good in this trial and "stall-out" did not appear to be a problem in any of the treatments. However, there were differences in feed consumption and daily gain as had been observed in previous experiments where pigs housed in the enclosed confinement facility did not show increased gains during the finishing period compared to the growing period.

Increasing the vitamin level in the feed to approximately two to five times the National Research Council recommendations had no effect on daily gain, feed consumption or feed efficiency.

### Summary

Sixty-four crossbred pigs were housed in an enclosed confinement building to study the effects of increased pen space and higher vitamin levels in the feed during the 140- to 220-pound period. Pigs given access to double pen space, 14.2 square feet per pig during this period, gained 8% faster ( $P < .05$ ) and consumed more ( $P < .05$ ) feed than pigs with 7.1 square feet of space. Doubling the vitamin level in the feed had no effect on pig performance during this period.

TABLE 2. EFFECT OF PEN SPACE AND VITAMIN SUPPLEMENTATION ON PIG PERFORMANCE<sup>a</sup>

Pen space <sup>b</sup> Vitamin level <sup>c</sup>	Regular	Double	Regular	Double
	Regular	Regular	Double	Double
Treatment no.	1	2	3	4
Avg initial wt, lb	57.7	58.4	58.6	58.6
Avg wt at change, lb	136.4	140.5	141.4	140.2
Avg final wt, lb	219.1	221.9	219.7	219.4
Avg daily gain, lb				
58-140 lb	1.63	1.72	1.75	1.71
140-220 lb <sup>d</sup>	1.83	2.07	1.83	1.88
58-220 lb	1.72	1.88	1.79	1.78
Avg daily feed, lb				
58-140 lb	4.79	5.15	5.11	5.23
140-220 lb <sup>e</sup>	6.11	7.64	6.56	6.71
58-220 lb	5.43	6.22	5.79	5.95
Feed/gain				
58-140 lb	3.02	3.07	3.00	3.11
140-220 lb	3.38	3.80	3.61	3.66
58-220 lb	3.20	3.43	3.30	3.38

<sup>a</sup>Four lots of four pigs each per treatment.

<sup>b</sup>Regular pen 7.1 square feet per pig, double space 14.2 square feet per pig after 140 pounds.

<sup>c</sup>Regular vitamin level shown in table 1 footnote, double level after 140 pounds.

<sup>d</sup>Difference due to pen space (P<.05), 2 vs 1 and 3.

<sup>e</sup>Difference due to pen space (P<.05), 2 vs 1, 3 and 4.

TABLE 3. SUMMARY OF EFFECTS OF PEN SPACE AND VITAMIN LEVEL ON FINISHING PIGS FROM 140 TO 220 POUNDS

Item	Pen space		Vitamin level	
	Regular	Double	Regular	Double
No. of pigs	32	32	32	32
Avg daily gain, lb <sup>a</sup>	1.83	1.98	1.95	1.86
Avg daily feed, lb <sup>a</sup>	6.23	7.20	6.84	6.60
Feed/gain	3.54	3.86	3.71	3.69

<sup>a</sup>Difference due to pen space (P<.05).