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Effect of Housing Type, Feeder Space and Pen Space on
Performance of Growing-Finishing Pigs

Richard C. Wahlstrom and George W. Libal

During the past several years there has been a trend toward more confinement type housing. Most of these houses have partial or completely slatted floors. Recommendations for feeder space are generally listed as one self-feeder hole for every three to four growing-finishing pigs and space per pig in slatted floor houses is suggested to be 5, 6 and 8 square feet for pigs from 60 to 100, 100 to 150 and 150 lb. to market weight, respectively. Research conducted at South Dakota and reported at the 1975 and 1976 Swine Field Days has shown that pigs housed in a total confinement building did not gain as well as pigs housed in open-front buildings with access to an outside concrete feeding floor. The difference in performance was found to occur mainly during the finishing period.

The experiment reported herein was conducted to obtain more information on the performance of pigs housed in different types of buildings and the effect of pig density per feeder hole.

Experimental Procedure

This experiment was conducted during the winter, mid-November to mid-February, with 144 crossbred pigs averaging approximately 61 pounds. They were allotted on the basis of ancestry, sex and weight to four replications of three treatments with each lot containing 12 pigs. The three treatments varied in the number of feeder spaces available as follows: (1) three pigs per feeding space, (2) four pigs per feeding space and (3) six pigs per feeding space. Wooden Smidley feeders were used. Two replications were housed in uninsulated wooden houses (8 x 14 feet) with concrete floors that were bedded with straw. The pigs had access to an outside concrete area (12 x 14 feet) where feeders and waterers were located. The other two replicates were housed in a completely enclosed confinement building with fully slatted floors. Pens were 7.5 x 9 feet including the area where self-feeders were located. This phase of the experiment was conducted for 8 weeks.

After the initial 8-week period, pigs in each of the six outside pens were divided into two groups with one group of six pigs remaining in the outside pens and the other group of six pigs was moved to the confinement house. Average weight at this time was approximately 156 pounds. These pigs were fed for an additional 28 days.

Pigs in the inside six pens during the initial 8-week period were adjusted so that there were two pens each of 8, 10 and 12 pigs per pen to study space needs during the finishing phase. Space per pig for the three groups was approximately 8.0, 6.4 and 5.3 square feet. Average initial weight was 158 lb. and this phase of the experiment was conducted for 27 days.

A 16% protein corn-soybean meal diet was fed to a weight of approximately 110 lb. when the diet was changed to 14% protein. The composition of the diets is shown in table 1.

Results

The effect of feeder space on rate of gain, feed consumption and feed efficiency is shown in table 2. Performance did not differ when three, four or six pigs were allotted for each available feeder space. Six pigs per available feeder hole is higher than generally recommended. However, it is possible that the total number of pigs per pen could also affect the number of pigs per feeder hole. In this experiment only 12 pigs were in each pen. The effect of total feeder space was similar when the pigs were housed in a confinement house with approximately 5.3 square feet per pig or in an open-front house with outside concrete feeding area which allowed approximately 9.3 square feet of inside area and 13 square feet of outside area.

Pigs housed in the confinement building gained about 3% slower (1.64 vs 1.69 lb. per day) but required 6% less feed/gain (3.08 vs 3.26) than pigs housed in the open-front, uninsulated buildings (table 3). The pigs in open-front buildings with feeders located outside consumed about 10% more feed daily. This trial was conducted for 8 weeks with pigs averaging approximately 61 lb. initially and 155 lb. at the end of the period. Temperatures were quite severe during most of this period. Maximum and minimum outside daily temperatures averaged 24 and 0° F, respectively, with a temperature range from +56 to -30° F.

The effects of type of housing on the performance of finishing pigs, 155 to 215 lb., are shown in table 4. During this 4-week period, pigs fed in the slatted floor confinement house gained 8% faster and required 11% less feed/gain than pigs housed in open-front buildings and fed in outdoor lots. The reduced feed/gain was due to the cold temperature which occurred during this period. Average daily maximum and minimum temperatures during this period (January 11 to February 8, 1977) were 16 and -7° F, respectively. These pigs had been housed in open-front buildings to 155 pounds.

Pigs that had been housed in the confinement building for the previous 8-week period gained much slower during the final 4-week finishing period (table 5). Slower gains of pigs in confinement during the finishing period had also been noted in our previous experiments. The results reported herein would indicate that pigs may become "fatigued" in slatted floor confinement units. The reasons for this are not clear, although they may be associated with boredom and a closely confined area.

Table 5 also reports the results of differing space allotments for finishing pigs on slatted floors in a total confinement building. Reducing the area per pig from 8 to 6.4 square feet did not affect performance. However, a further reduction to 5.3 square feet per pig resulted in slightly slower gains and reduced feed consumption. It should be noted that the reduced area was accomplished by increasing the number of pigs per pen so it is not possible to determine if the effect on pig performance was due to space needs per se, pig density or a combination of both factors.

Summary

A winter trial was conducted with 144 crossbred growing-finishing pigs to study various management factors.

There were no differences in performance of growing pigs that were allowed one feeder hole space for every three, four or six pigs. Pigs housed in a completely confined, slatted floor house gained 3% slower but required 6% less feed/gain than pigs housed in open-front buildings with outside feeding floors during the period from 58 to 157 pounds. During a subsequent 4-week finishing period, pigs that had been housed outside previously gained faster and more efficiently when in confinement buildings than when continued in the open-front buildings. Both groups performed considerably better than pigs continued in the confinement building during the finishing period. Finishing pigs fed in confinement consumed less feed and gained less if allowed 5.3 square feet per pig compared to pigs having a pen area of 6.4 or 8.0 square feet per pig.

Table 1. Composition of Diets (Percent)

	16% protein to 110 lb.	14% protein 110-210 lb.
Ground yellow corn	76.5	82.2
Soybean meal, 44%	20.7	15.0
Dicalcium phosphate	1.2	1.2
Ground limestone	.9	.9
Trace mineral salt ^a	.5	.5
Vitamin-antibiotic mix ^b	.2	.2

^a Contained 1% zinc.

^b Supplied 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, 50 mg; vitamin B₁₂, 5 mcg and aureomycin, 10 milligrams.

Table 2. Effect of Feeder Space on Pig Performance

	Pigs per feeder space		
	3	4	6
Number of pigs ^a	48	48	48
Avg. initial wt., lb.	61.5	61.4	61.4
Avg. final wt., lb.	152.9	155.9	155.6
Avg. daily gain, lb.	1.63	1.69	1.68
Avg. daily feed cons., lb.	5.24	5.32	5.28
Feed/gain	3.21	3.16	3.14

^a Four lots of 12 pigs each per treatment.

Table 3. Effect of Housing on Performance of Growing Pigs (8 Weeks)

	Type of housing	
	Complete confinement	Open-front
Number of pigs ^a	72	72
Avg. initial wt., lb.	64.0	58.8
Avg. final wt., lb.	156.5	153.6
Avg. daily gain, lb.	1.64	1.69
Avg. daily feed cons., lb.	5.05	5.51
Feed/gain	3.08	3.26

^a Six lots of 12 pigs each per treatment.

Table 4. Effect of Housing on Performance of Finishing Pigs (4 Weeks)

	Type of housing	
	Confinement	Open-front
Number of pigs ^a	33	34
Avg. initial wt., lb.	156.1	155.4
Avg. final wt., lb.	215.4	210.0
Avg. daily gain, lb.	2.11	1.95
Avg. daily feed cons., lb.	7.74	7.92
Feed/gain	3.67	4.08

^a Six lots of five or six pigs each per treatment.

Table 5. Effect of Pen Space Per Pig on Growth and Feed Efficiency

	Area per pig, sq. ft.		
	8	6.4	5.3
Number of pigs ^a	16	20	24
Avg. initial wt., lb.	160.0	157.2	158.4
Avg. final wt., lb.	200.8	199.6	197.6
Avg. daily gain, lb.	1.51	1.57	1.45
Avg. daily feed cons., lb.	6.68	7.00	6.36
Feed/gain	4.43	4.48	4.33

^a Two lots of 8, 10 or 12 pigs per treatment.