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Brookings, South Dakota

Department of Animal Science
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Effect of Housing and Supplemental Dietary Iron on Performance of Growing-Finishing Pigs

Richard C. Wahlstrom and George W. Libal

In a previous experiment at this station reported at the 1975 Swine Day (A.S. Series 75-52), it was found that pigs housed in wooden houses with concrete floors and concrete outside pens gained faster during the finishing period than pigs housed in similar houses in dirt lots or in a confinement house with slatted floors. The increase in gain was associated with an increase in feed consumption. This experiment was conducted to see if this difference in performance was repeatable. The value of adding a high level of iron to the diet was also studied, since some swine producers had indicated improved performance of pigs fed supplemental iron.

Therefore, the objectives of this experiment were (1) to determine the performance of pigs fed in a confinement or open-front type building with concrete outside lots and (2) to determine the effect of 250 ppm of supplemental iron on gain, feed consumption and feed efficiency of growing-finishing pigs.

Experimental Procedure

Seventy-two crossbred pigs weighing approximately 80 lb. were allotted to eight lots of 9 pigs per pen. Replicated lots were assigned to the four treatments as follows:

Treatment 1 -- Confinement house, no supplemental iron
Treatment 2 -- Confinement house, 250 ppm supplemental iron
Treatment 3 -- Outside concrete pen, no supplemental iron
Treatment 4 -- Outside concrete pen, 250 ppm supplemental iron

The pens in the confinement house were 9 by 7.5 feet with 3.5 inch aluminum slats spaced 1 inch apart. The outside pigs were housed in 8 by 12 foot wooden houses having concrete floors and a 12 by 16 foot outside concrete lot where feeders and waterers were located. The experiment was conducted from August 18 to November 19. Composition of the basal diets is shown in table 1.

Results

The effects of housing type and supplemental dietary iron on rate of gain, feed consumption and feed efficiency are summarized in table 2. Pigs housed in the confinement house gained significantly slower than pigs with outside lots during both the growing and finishing periods. In both periods gain was reduced approximately 0.2 lb. per day as it was also for the entire experiment. During the growing period from 80 to 125 lb. there was no difference in feed consumption. Therefore, the pigs with access to the outside environment were more efficient, requiring about 14% less feed during

this time. In the finishing period pigs in the confinement house consumed less feed per day but required 4% more feed than pigs with access to the outside. For the entire experiment both rate and efficiency of gain were significantly reduced for pigs in the confinement house.

The difference in performance of these pigs may be due to several factors. Although the pigs housed in confinement had a space allotment equal to that recommended for pigs on slatted floors, the nonconfined pigs had a total pen space (sleeping and eating) approximately four times larger. There was also a difference of concrete floors in outside housing and aluminum slats in the confinement building. Temperature, air movement, gases from the pit under the slatted floor, noise from exhaust fans and dust are a few other factors that would have varied and it is not known what these effects were on the performance observed here.

Supplementing the basal diet with 250 ppm of iron did not affect rate of gain, feed consumption or feed efficiency during either the growing or finishing periods. Performance was almost identical for both treatments during the entire experiment. Rate of gain was 1.68 lb. per day for both treatment groups and feed per gain was 3.61 and 3.63 for the unsupplemented and iron supplemented groups, respectively.

Summary

An experiment was conducted using 72 crossbred pigs fed corn-soybean meal diets with 0 or 250 ppm of supplemental iron from heptahydrated ferrous sulfate. Four lots of pigs received the iron supplemented diets and four lots the unsupplemented basal diet. In addition, two lots of pigs receiving each of these two diets were housed in a confinement building in pens with aluminum slatted floors and the other four lots were housed in wooden, open-front type buildings with access to an outside concrete lot for feed and water.

Pigs with access to the outside environment gained significantly faster and required significantly less feed/gain than those in the confinement building. There was no effect on pig performance by including 250 ppm of iron in the basal diets.

Table 1. Composition of Basal Diets (Percent)

	14% crude protein To 125 lb.	12% crude protein 125 to 225 lb.
Ground yellow corn	81.9	87.5
Soybean meal, 44%	15.0	9.3
Dicalcium phosphate	1.2	1.3
Ground limestone	0.9	0.9
Trace mineral salt[a]	0.5	0.5
Vitamin-antibiotic mix[b]	0.5	0.5

[a]Contained 1% zinc.

[b]Supplied per lb. of diet: vitamin A, 1500 IU; vitamin D, 150 IU; vitamin E, 2.5 IU; riboflavin, 1.25 mg; pantothenic acid, 5 mg; niacin, 8 mg; choline, 25 mg; vitamin B_{12}, 5 mcg and aureomycin, 10 milligrams.

Table 2. Effect of Type of Housing and Supplemental Dietary Iron on Pig Performance

	Type of housing		Supplemental iron	
	Inside	Outside	0	250 ppm
Number of pigs	36	36	36	36
Avg. initial wt., lb.	80.5	80.6	80.5	80.6
Avg. final wt., lb.	220.7	225.5	223.0	223.2
Initial to 125 lb.				
Avg. daily gain, lb.[a]	1.41	1.63	1.52	1.53
Daily feed consumed, lb.	4.83	4.79	4.73	4.88
Feed/gain	3.43	2.93	3.15	3.21
125 lb. to 225 lb.				
Avg. daily gain, lb.[a,b]	1.66	1.86	1.76	1.76
Daily feed consumed, lb.	6.30	6.95	6.70	6.55
Feed/gain	3.92	3.75	3.83	3.84
Initial to 225 lb.				
Avg. daily gain, lb.[a,b]	1.58	1.78	1.68	1.68
Daily feed consumed, lb.	5.77	6.17	6.00	5.94
Feed/gain[c]	3.76	3.48	3.61	3.63

[a]Significant difference (P<.01) due to type of housing.
[b]Significant difference (P<.01) due to sex.
[c]Significant difference (P<.05) due to type of housing.