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and 25 Percent vs. 50 Percent
Slotted Floor for Swine**

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COMPARISON OF FEEDING METHODS AND TWENTY-FIVE VERSUS FIFTY PERCENT SLOTTED FLOOR FOR SWINE

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Labor continues to be a critical factor in producing swine. Studies have shown that labor for cleaning can be reduced if swine are housed on slotted floors. Considerable labor may still be required if hogs are self-fed on partially slotted floors. It has been observed that the cleanliness of the pen improved as the slotted floor area increased.

Floor feeding was developed to fully utilize new equipment designed to minimize the amount of labor required to grind, mix and handle feed. Floor feeding has also been suggested as a way to encourage the pig to dung in the desired area and, therefore, reduce the labor necessary for cleaning when pigs are kept on partially slotted floors.

Other feeding methods such as self-feeding of corn and self-feeding or hand-feeding of protein supplement continue to be used. The objective of this study was to compare floor-feeding of a complete ration, self-feeding of a complete ration, self-feeding of shelled corn and protein supplement, and self-feeding of shelled corn and hand-feeding of protein supplement in pens with 25 and 50% slotted floors.

Experimental Procedure

Trial I. Floor-feeding and self-feeding (self-feeders used) were compared in pen with 25 and 50% slotted floors (concrete slots, 3 in. wide). There were two replications with the following treatments in each replication: (1) 25% slotted floor - 3 pens floor-fed and one pen self-fed; (2) 50% slotted floor - 3 pens floor-fed and one pen self-fed. Replication 1 was housed in a semicontrolled environmental building and replication 2 was housed in a half-open shelter-type building. One hundred twelve crossbred pigs weighing from 70-130 lb. body weight were divided into outcome groups by weight and randomly assigned to treatments (7 pigs per pen). Pens were 5 x 15 ft. and equipped with automatic waterers. Floor-fed pigs were fed five times daily at 3-hour intervals starting at 6 a.m. using an automatic floor-feeding system (mix mill) which deposited feed on the solid concrete floor portion of the pen. The automatic system for the floor-fed pigs was set so as to provide maximum feed intake as closely as possible without feed wastage. Frequent changes were necessary. Pigs were weighed and feed consumption was recorded at two-week intervals. The trial was terminated when the average weight of the pigs in each pen was approximately 200 lb. Composition of the supplement and protein levels are shown in table 1.

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^b Appreciation is expressed to C. E. Babb for caring for animals and Dr. C. Y. Kramer for statistical analysis.

Trial II. Eighty crossbred pigs were divided into outcome groups by weight and randomly assigned to treatments: (1) a complete ration was self-fed in feeders, (2) a complete ration was floor-fed, (3) shelled corn and protein supplement were self-fed separately, and (4) shelled corn was self-fed and the protein supplement was hand-fed. Each of the above treatments was fed to two pens of 10 pigs - one with 25% slots and one with 50% slots. The initial body weight of the pigs ranged from 55 to 95 lb. The semicontrolled environmental building and the automatic feeding system described in trial I were used in trial II. Composition of the protein supplement is shown in table 1. For the complete ration, corn and the protein supplement were combined to give the desired protein level. A 15.6% crude protein level was fed from 40 to 75 lb., 13.8% from 75 to 125 lb. and 12% from 125 to 225 lb. Pigs floor-fed were fed five times per day during the first part of the trial and were given an additional feeding at midnight during the latter part of the trial. As in Trial 1, as nearly as possible, floor-fed pigs were given the maximum amount of feed they would consume without feed wastage. Pigs on the treatment 4 were fed 1/2 lb. of protein supplement per head daily to an average weight of 90 lb., 3/4 lb. from 90 to 135 lb. and 1 lb. from 135 to 200 lb. Body weights were measured and feed consumed was recorded at two-week intervals. The trial was terminated when the average weight of the pigs in each pen was approximately 200 lb.

Data was statistically analyzed using the analysis of variance and the multiple range test (Duncan, 1955).

TABLE 1. COMPOSITION OF PROTEIN SUPPLEMENT

Ingredients	Protein Supplement ^a
Soybean meal (50%), lb.	89.68
Defluorinated phosphate, lb.	4.08
Limestone, lb.	3.06
Trace mineral salt, lb. ^b	2.55
Vitamin premix, lb. ^c	0.64
Zinc sulfate, gm./100 lb.	5.10
Copper sulfate, gm./100 lb.	0.61

^a Corn and protein supplement were combined to give the following protein levels: 15.6% crude protein level was fed from 40-75 lb., 13.8% from 75-125 lb. and 12% from 125-225 lb.

^b Contained (%): 0.2 Mn, 0.16 Fe, 0.033 Cu, 0.01 Co, 0.007 I, 0.005 Zn and 96.9 NaCl.

^c Supplied (per pound of premix): 0.4 gm. riboflavin, 1.0 gm. pantothenic acid, 20 gm. choline chloride, 4.0 gm. niacin, 3.2 mg. vitamin B₁₂, 600,000 I.U. vitamin A, 200,000 I.C.U. vitamin D and 36 mg. ethoxyquin.

Results and Discussion

Average daily gain, feed intake and efficiency values are summarized in table 2 for trial I. Floor-fed pigs gained significantly less than self-fed pigs. Average feed intake of floor-fed pigs was less and this may have been a result of being unable to set the floor-feeding system so it would provide maximum feed intake as closely as possible to that of self-fed pigs without having feed wastage. There also appeared to be more feed wastage in the floor-fed pigs as the feed required per pound of gain was greater as compared to the self-fed pigs. The small difference in feed intake would not normally affect the feed efficiency.

TABLE 2. AVERAGE DAILY GAIN, FEED INTAKE AND
FEED EFFICIENCY OF FINISHING PIGS -
FLOOR-FED AND SELF-FED. TRIAL I

Criteria	Feeding Method	
	Self-Fed	Floor-Fed
No. of pigs	28	84
Av. initial wt., lb.	110	107
Av. final wt., lb.	200	194
Av. daily gain, lb.	1.18 ^a	1.11
Av. daily feed intake, lb.	4.92	4.75
Feed per lb. of gain, lb.	4.15	4.28

^a Significantly greater ($P<0.01$) than floor-fed mean.

Average daily gain, feed intake and efficiency values are shown in table 3 for trial II. In agreement with trial I, average daily gain of floor-fed pigs was significantly less than that of self-fed pigs. Gains of pigs fed shell corn and protein supplement free choice, and pigs hand-fed protein supplement and self-fed corn were intermediate between floor-fed and self-fed pigs. The feed required per pound of gain was greatest ($P<0.05$) for floor-fed pigs as compared to pigs fed by the other methods.

Average daily gain, feed intake and efficiency value are summarized in table 4 by slot percentage for trials I and II. There were no differences in average gain, feed intake and feed per pound of gain for pigs housed in pens with either the 25 or 50% slots. This finding agrees with reports by other workers (Hoefler and Harmon, 1960; Seerley et al., 1966; and Jones et al., 1967) who found no difference in gain between pigs housed on solid concrete floors as compared to pigs housed on partially slotted floors (25% and 50% slots and completely slotted floors).

TABLE 3. AVERAGE DAILY GAIN, FEED INTAKE AND
FEED EFFICIENCY OF GROWING AND FINISHING
PIGS FED BY DIFFERENT METHODS. TRIAL II

Criteria	Feeding Methods ^a			Corn FC and Supplement hand fed
	Complete Ration		Corn and Suppl. FC ^b	
	Self-fed	Floor-fed		
Av. initial wt., lb.	76	76	77	76
Av. final wt., lb.	205	201	199	202
Av. days on test	83	93	83	90
Av. daily gain, lb.	1.56 ^c	1.31 ^d	1.47 ^{ce}	1.40 ^{de}
Av. daily feed intake, lb.	5.86	5.68	5.17	4.94
Feed per lb. of gain, lb.	3.75 ^c	4.28 ^d	3.52 ^c	3.52 ^c

^a Twenty pigs in each treatment.

^b Free choice fed

^{cde} Means with different superscript letter are significantly different (P<0.05).

TABLE 4. AVERAGE DAILY GAIN, FEED INTAKE AND
FEED EFFICIENCY OF PIGS FED IN PENS WITH
25 AND 50 PERCENT SLOTTED FLOORS

Criteria	Percent			
	25		50	
	Trial I	Trial II	Trial I	Trial II
No. of pigs	56	40	56	40
Av. initial wt., lb.	108	76	107	76
Av. final wt., lb.	199	200	192	203
Av. daily gain, lb.	1.16	1.40	1.10	1.47
Av. daily feed intake, lb.	4.81	5.28	4.77	5.56
Feed per lb. of gain, lb.	4.16	3.77	4.43	3.77

In these two trials, floor-fed pigs gained slower and were less efficient as compared to self-fed pigs. Bowland (1964) reported no difference in gain and feed efficiency when pigs were fed the same amount of feed in a feeder or on the floor. However, in Bowland's trial the pigs were fed only once a day. He did report that there was slightly slower gain and less efficient use of the feed when it was fed in four

equal parts on the floor as compared to four equal parts in a self-feeder. The slower gain of floor-fed pigs in these two trials was due to the inability to feed as much feed per day as the self-fed pigs received without having a large amount of feed wastage. Floor feeding may be more practical when some restriction of intake is desired. The restriction of intake would reduce the possibility of feed wastage.

Summary

Two trials were conducted with 192 pigs to study different feeding methods using pens with 25 and 50% slotted floors. In trial I, where floor-feeding was compared only to self-feeding, it was found that average daily gain and feed efficiency was greater for pigs self-fed. In trial II, four feeding methods were compared: (1) self-feeding of a complete ration, (2) floor-feeding of a complete ration, (3) free choice feeding of shell corn and protein supplement separately, (4) shell corn was self-fed and the protein supplement was hand-fed. In agreement with trial II, the self-fed pigs had greater gains and feed efficiency as compared to the floor-fed pigs with the gain and efficiency intermediate for pigs fed corn and protein supplement free choice, and pigs fed corn free choice and hand-fed protein supplement. There was no significant difference in performance of the pigs housed in pens with the 25 and 50% slotted floors. The lower gain of the pigs floor-fed may have been partly due to the inability to regulate the automatic feeding system so as to provide maximum feed intake as closely as possible to that of the pigs self-fed without having large amounts of feed wastage.

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