

Swine

Effect of Pellet Size on Pig Performance

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Story in Brief

Two trials were conducted involving 208 growing-finishing pigs to study the effect of pellet size on performance of growing-finishing swine. The pigs were self fed in confinement from an average weight of 63.2 to 223.7 lb. and 48.7 to 201.2 lb. for Trials 1 and 2 respectively. Milo and wheat were the cereal grains used in Trials 1 and 2, respectively.

The treatments involved in both trials were a meal ration, a 3/16 inch pellet ration, a 1/4 inch pellet ration, and a 3/8 inch pellet ration. Pelleting tended to improve average daily gains and feed efficiency in both trials. Size of pellets had little affect on the pigs fed milo rations in Trial 1 but tended to favor the smaller size pellets (3/16 and 1/4 inch) for the pigs fed the wheat rations in Trial 2.

Introduction

Previous research conducted in the Department of Animal Sciences and Industry has shown that pelleting of a milo-soybean meal or a wheat-soybean meal ration resulted in approximately a 7 percent improvement in average daily gains and a 10 percent improvement in feed efficiency for growing-finishing swine.

Since research work here and at other research stations indicated advantages of pelleting swine rations, it was deemed feasible to study the optimum pellet size for growing-finishing swine. Traits studied included average daily gain, feed efficiency, feed intake and probed back-fat thickness.

Experimental Procedure

All pigs were housed in indoor concrete pens equipped with self feeders and waterers. In both trials the pigs were randomly allotted within breed, sex and litter to four experimental treatments. Pigs were fed

In cooperation with USDA Agricultural Research Service, Southern Region.

either a meal form ration or a pelleted ration prepared by a California Master Model Pellet Mill at the Oklahoma State University Feed Mill.

Trial 1

Trial 1 consisted of 64 purebred Hampshire or Yorkshire pigs with eight pens (two pigs per pen) on each of four treatments. A 16 percent crude protein milo-soybean meal ration as shown in Table 1 was self fed to all pigs from an average weight of 63.2 lb. to 223.7 lb. Treatments involved were (1) a meal ration, (2) a 3/16 inch pellet ration, (3) a 1/4 inch pellet ration and (4) a 3/8 inch pellet ration. Pigs were individually removed from treatment on a weekly basis when they reached 220 lb.

Trial 2

Trial 2 consisted of 144 purebred Duroc, Hampshire or Yorkshire gilts with four pens (nine pigs per pen) on each of four treatments. A 16 percent crude protein wheat-soybean meal ration as shown in Table 1 was self fed to all pigs from an average weight of 48.7 lb. to 201.2 lb. Treatments involved were (1) a meal ration, (2) a 3/16 inch pellet ration (3) a 1/4 inch pellet ration and (4) a 3/8 inch pellet ration. Pigs were individually removed from treatment on a weekly basis when they reached 200 lb.

Results and Discussion

Trial 1

The results of Trial 1 are shown in Table 2. Pigs on treatment 3 (1/4 inch pelleted ration) had the highest average daily gain and was

Table 1. Composition of Experimental Rations

	Trial 1	Trial 2
Ingredients, %		
Milo, ground	68.00	-
Wheat, ground	-	75.10
Soybean meal (%)	22.75	16.75
Molasses (wet)	5.00	5.00
Calcium carbonate	0.70	0.80
Dicalcium phosphate	1.50	1.30
Salt	0.50	0.50
Vitamin-trace mineral mix ¹	0.50	0.50
Aureomycin 10	0.25	0.25
Aureomycin 50	-	0.05
Total	100.00	100.00
% protein	16.01	16.01
% calcium	0.71	0.71
% phosphorous	0.60	0.60

¹ Supplied 3,000,000 I.U. vitamin A, 300,000 I.U. vitamin D, 4 gm. riboflavin, 20 gm. pantothenic acid, 50 gm. niacin, 1,000 gm. choline chloride, 15 mg. vitamin B₁₂, 6,000 I.U. vitamin E, 20 gm. menadione, 0.2 gm. iodine, 90 gm. iron, 20 gm. manganese, 10 gm. copper and 90 gm. zinc per ton of feed.

Table 2. Effect of Pellet Size on Pig Performance—Trial 1

	1 (meal form)	2 (3/16 in. pellet)	3 (1/4 in. pellet)	4 (3/8 in. pellet)
Pens per treatment, no.	8	8	8	8
Pigs per pen, no.	2	2	2	2
Av. initial wt., lb.	63.1	63.2	64.3	62.0
Av. final wt., lb.	223.1	223.6	226.1	221.9
Av. daily gain, lb. ¹	1.75 ¹	1.82 ^{1,2}	1.88 ²	1.82 ^{1,2}
Av. daily feed intake, lb.	5.84	5.53	5.73	5.52
Feed per lb. gain, lb. ¹	3.36 ²	3.04 ²	3.05 ²	3.04 ²

¹ Means with different superscripts are significantly different ($P < .05$).

significantly higher than those on treatment 1, (meal form ration). Pigs on treatment 2 (3/16 inch pelleted ration) and treatment 4 (3/8 inch pelleted ration) also had higher average daily gains than those on treatment 1. Pigs on treatment 1 (meal form ration) required significantly more feed per pound of gain than the pigs on the other treatments.

No significant differences were noted in average daily feed intake but the pigs on the pelleted rations tended to consume less. This feed savings may largely result from a reduction in feed wastage. While pelleting in general tended to improve average daily gains and feed efficiency, little difference was noted due to size of pellets.

Trial 2

The results of Trial 2 are shown in Table 3. Pigs on all the pelleted rations had higher average daily gains than those on the meal form ration. Pigs on Treatment 2 (3/16 inch pellet ration) had the highest average daily gain and was significantly higher than those on treatment

Table 3. Effect of Pellet Size on Pig Performance — Trial 2

	1 (meal form)	2 (3/16 in. pellet)	3 (1/4 in. pellet)	4 (3/8 in. pellet)
Pens per treatment, no.	4	4	4	4
Pigs per pen, no.	9	9	9	9
Av. initial wt., lb.	49.2	48.4	48.6	48.6
Av. final wt., lb.	200.5	203.1	201.4	199.8
Av. daily gain, lb. ¹	1.52 ¹	1.65 ²	1.60 ^{2,3}	1.56 ^{1,3}
Av. daily feed intake, lb.	4.55	4.70	4.75	4.71
Feed per lb. gain, lb. ¹	3.01 ²	2.85 ²	2.97 ²	3.02 ²
Av. adjusted backfat, in.	1.15	1.16	1.13	1.12

¹ Means with different superscripts are significantly different ($P < .05$).

1 (meal form ration) and treatment 4 ($\frac{3}{8}$ inch pellet ration). Pigs on treatment 2 required significantly less feed per pound of gain than those on treatment 1.

No significant differences were noted in average daily feed intake or probed backfat thickness. Pelleting in general tended to improve average daily gains and the smallest size pellet ($\frac{3}{16}$ inch) tended to result in the best feed efficiency.

The Effect of Ration Ingredient Change on Pig Performance

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Story in Brief

Two trials were conducted involving 128 growing-finishing pigs to measure the effect of marked ration ingredient change on pig performance.

Treatments involved in both trials were (1) a basal milo-soybean meal ration fed throughout the trials; (2) the cereal grain portion of the rations (milo, corn, and wheat) was rotated every 7 days; (3) the protein source (all soybean meal, $\frac{1}{3}$ meat and bone scraps and $\frac{2}{3}$ soybean meal, and $\frac{1}{3}$ peanut meal and $\frac{2}{3}$ soybean meal) was rotated every 7 days; (4) both the cereal grain and protein sources, as outlined in Treatments 2 and 3 were rotated every 7 days (nine different combinations).

No significant differences were noted in average daily gains, average daily feed intake, feed efficiency and probed backfat thickness. The results suggest that marked ration ingredient changes has little effect on pig performance when nutritional requirements are met.