The Value of Processing Sorghum Grain For Finishing Swine

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Summary

Three feeding trials were conducted to determine benefits of processing sorghum grain (milo) for finishing swine. Flaked, ground, and dry rolled milo rations resulted in similar pig weight gains. Generally, the feed:gain ratios of pigs receiving steam-flaked rations were slightly better than ratios of pigs receiving ground or dry rolled grain. Pigs receiving a popped ration grew significantly slower and less efficiently than pigs receiving ground or flaked rations. Grinding the popped ration increased average daily feed intake and average daily gain, but the feed:gain ration did not improve.

Finishing swine can be fed steam-flaked milo very satisfactorily; however, the cost of processing the milo more than offset the advantages in feed efficiency.

Procedure

The purpose of this trial was to determine effects of dry rolling, grinding, flaking, and popping sorghum grain (milo) on the performance of finishing swine. Three feeding trials used 167 pigs (Yorkshires, Hampshires, Durocs, and Crossbreds) averaging approximately 70 to 95 pounds.

Trial I. Fifty-seven pigs were randomly allotted to one of three treatments: (a) dry rolled milo, complete ration; (b) flaked milo, fed free choice; (c) flaked milo, complete ration. The steam flaking is a moist heat treatment followed by flat rolling and cooling. The complete rations (A & C) consisted of 1600 pounds of processed grain plus 400 pounds of a protein supplement (table 13). Free-choice feeding provided flaked milo in two two-hole self feeders and protein supplement in another two-hole feeder with water from two automatic waterers for each pen of 19 pigs. Pigs were housed in an open-front, totally slatted pen, 12' x 15'. The trial was during June - September.

Trial II. Fifty pigs weighing approximately 95 pounds were randomly assigned to these five treatments (ten pigs per pen): (a) ground milo, (b) flaked milo, (c) ground, flaked milo, (d) popped milo, (e) ground, popped milo. Each pen of pigs received a complete mixed ration using 1600 lbs. of grain and 400 lbs. of supplement. Popping sorghum grain is a dry

heat process in a gas-fired infra-red burner where temperature is ± 750°F.

Trial II lasted 54 days, used an open-front, totally-slatted finishing unit. Each pen (6' x 15') contained one two-hole self feeder and one automatic waterer.

Trial III. Sixty pigs were randomly assigned to one of these treatments: (a) ground milo, (b) flaked milo, (c) ground, flaked milo. Twenty pigs were penned together in a 12' x 15' pen with access to three two-hole self feeders and two automatic waterers. The trial was during winter when the finishing barn was totally enclosed and propane heaters supplied supplemental heat. The floor is 4" concrete slats with 1" slotting.

Table 13. Protein Supplement Mix (38% Crude Protein)

Ingredients	Lbs./ton of ration
Soybean meal (44%)	1210
Meat & bone scraps (50%)	400
Alfalfa meal (17%)	200
Dicalcium phosphate	50
Limestone	50
Salt	50
Trace mineral	8
Aureo SP-250	20
Vitamin premix[a]	12

[a] Fortification per pound of supplement: Vitamin A 4540 I.U., Vitamin D 750 I.U., Vitamin E 80 I.U., Niacin 48 mg., Riboflavin 16 mg., Pantothenic Acid 32 mg/lb., Choline 160 mg., Vitamin B_{12} 40 mcg.

Results and Discussion

Performance data of pigs in trial 1 are presented in table 14. The average daily feed intake of pigs fed free choice was 3.11 lbs. of flaked grain and 1.03 lbs. of protein supplement, lowest of the three treatments. However, daily gains from all three treatments were the same. Feed:gain ratio favored pigs on processed grain over those on the dry rolled ration. Extremely hot weather during the trial tends to explain the lower-than-expected gains from all three groups.

Table 15 shows the performance of the second trial, which used only ten pigs per pen. Pigs receiving the ground ration (3/8 inch screen) gained significantly ($P < .05$) faster than pigs

receiving any other ration. Grinding the flaked ration gave a performance similar to that from the whole flaked ration but slightly higher average daily feed intake. Pigs receiving popped grain grew significantly (P<.05) slower than those on any other treatment. The increased bulk of the grain likely was responsible for their eating less feed per day. Grinding the popped ration resulted in greater daily feed intake and weight gains similar to those from the two flaked rations.

Table 14. Performance Data of Pigs Fed Processed Sorghum Grain (Milo) (Trial I, 88 Days)

Ration	Dry roll	Free-choice flaked	Flaked
No. pigs	19	19	19
Initial wt., lbs.	69.1	69.2	71.3
Final wt., lbs.	179.5	182.6	181.0
Avg. daily gain, lbs.	1.26	1.27	1.26
Avg. daily feed intake, lbs.	5.01	4.14	4.28
Feed/lb. gain	3.99	3.25	3.41

Table 15. Performance Data of Pigs Fed Processed Sorghum Grain (Milo) (Trial II, 54 Days)

Ration processed	Ground	Flaked	Gr. flaked	Popped	Gr. popped
No. pigs	10	10	10	10	10
Initial wt., lbs.	95.6	86.4	91.0	94.6	94.6
Final wt., lbs.	204.1	180.7	183.7	174.2	182.8
Avg. daily gain, lbs.	2.01[a]	1.75[b]	1.72[b]	1.47[c]	1.63[bc]
Avg. daily feed, lbs.	6.32	5.39	5.55	5.14	5.82
Feed/lb. gain	3.14	3.09	3.23	3.49	3.56

[abc] Means with different superscripts on the same line differ significantly (P<.05).

The most total feed was required to support a pound of gain on popped-grain rations. Feed:gain ratios were quite similar for all ground and flaked rations.

Table 16 presents the performance of trial III. In this trial, non-significant differences were observed for the trait

of average daily gain. The flaked rations (fed as flake or ground) did result in slightly faster gain and resulted in approximately 8% more efficient gains.

Table 16. Performance Data of Pigs Fed Processed Sorghum Grain (Milo) (Trial III, 65 Days)

Ration processed	Ground	Flaked	Gr. Flaked
No. pigs	20	18[a]	20
Initial wt., lbs.	72.4	76.5	73.3
Final wt., lbs.	176.3	183.5	182.6
Avg. daily gain, lbs.	1.60	1.65	1.68
Avg. daily feed intake, lbs.	5.22	5.01	5.05
Feed/lb. gain	3.27	3.04	3.00

[a] Two pigs were removed the third day of the trial because of tail biting.