Swine

Micronized Grain Sorghum For Growing-Finishing Pigs

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Story in Brief

A trial was conducted involving 108 growing-finishing purebred gilts to study the effect of micronizing a grain sorghum ration. The treatments involved were (1) a ground (meal form) ration (2) a micronized ration and (3) a micronized-reground ration. Average starting weights were 57.1 lbs. The pigs on Treatment 1 and 3 were fed to an average weight of 200.2 lbs. Treatment 2 was discontinued when the pigs average weighing 156.1 lbs. because of extremely poor feed intake and daily gains. Several of the pigs developed symptoms of emaciation, enlarged vulvas and incoordination with a reeling unsteady gait.

The pigs on Treatment 3 (micronized-reground rations) required significantly less feed per pound of gain (2.87 vs. 3.07 lb.) than those on Treatment 1 (ground ration). No significant differences were noted in average daily gains or probed backfat thickness.

Introduction

Cereal grains normally account for 70 to 85 percent of a ration for growing-finishing swine. The current high prices of grain have further increased interest in methods of improving feed utilization, since it is normally the major item of cost in a swine ration.

Previous research at Oklahoma State University has shown that dry heat treatment, micronization, tended to improve utilization of grain sorghum for finishing beef cattle. Thus it was deemed feasible to conduct a study to investigate the use of micronization for processing grain sorghum for growing-finishing swine.

Experimental Procedures

One hundred and eight purebred Duroc, Hampshire and Yorkshire gilts were used in this study. The pigs averaging 57.7 pounds were randomly allotted within breed and litter to three experimental treatments. Each treatment consisted of four replicates containing nine gilts each. The pigs were housed and group-fed in open shed concrete pens equipped with self feeders and automatic waterers. Pigs completing the experiment were individually removed from test and probed for backfat thickness on a weekly basis when they reached 200 pounds.

The treatments (processing methods used) are as follows:

1. Dry Grinding - The grain sorghum was ground to a medium fineness with a hammer mill using a ¼ inch screen.
2. Micronization - The equipment used for micronizing the grain sorghum was a reciprocating steel table. The table activated by a ½ horsepower electric motor was ½ inch thick, 46½ inches wide and 13 feet long. Eight gas-fired infrared generators, rated at 50,000 BTU per hour each and suspended approximately 6 inches above the table, were used to heat the grain sorghum as it passed over the table. The grain sorghum after being passed under the gas-fired generators then dropped directly through an 8½ x 30 inch roller mill with a roller spacing of .003 inch.
3. Micronization-Reground - The grain sorghum was first micronized as described in Treatment 2 and then ground as described in Treatment 1.

The grain sorghum used in all treatments was cleaned of foreign materials by a clipper cleaner, Model 27, before processing. The composition of the experimental ration fed is shown in Table 1. When the grain was processed for the three different treatments, adjustments were made for moisture content so that all rations contained the composition indicated on a 90 percent dry matter basis. Actual moisture content for the ground and micronized grain sorghum was 14.24 and 7.79 percent moisture respectively.

Results and Discussion

The results of this experiment are presented in Table 2. The gilts on Treatment 2 were removed at an average weight of 156.1 pounds because of extremely poor feed intake and daily gains. Several of these pigs developed symptoms of emaciation, enlarged vulvas and incoordination with a reeling unsteady gait. The symptoms were similar to those report-

Table 1. Composition of Experimental Rations[1]

Ingredients %	
Grain Sorghum	73.55
Soybean Meal, 44%	22.90
Calcium Carbonate	1.20
Dicalcium phosphate	1.30
Salt	0.50
Vitamin-trace mineral mix[2]	0.50
Aureomycin 50	0.05
Total	100.00
% protein, calculated	16.00
% calcium, calculated	0.80
% phosphorous, calculated	0.60

[1] Formulated on a 90% Dry Matter Basis.
[2] 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 B_{12}, 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. Micronized Grain Sorghum for Growing-Finishing Pigs

	Treatments		
	1 (ground)	2[1] (micronized)	3 (micronized-reground)
Pens per treatment, no.	4	4	4
Pigs per pen, no.	9	9	9
Av. initial wt. lb.	57.5	58.2	57.3
Av. final wt., lb.	200.0	156.1	200.4
Av. daily gain, lbs.	1.56		1.56
Feed per lb. gain, lb.[2]	3.07		2.87
Av. daily feed intake, lb.[3]	4.82		4.49
Probed backfat thickness, in.	1.09		1.07

[1] Treatment 2 was discontinued when pigs averaged weighing 156.1 pounds because of extremely poor feed intake and daily gains. Several of the pigs developed symptoms of emaciation, enlarged vulvas and incoordination with a reeling unsteady gait.
[2] Pigs on Treatment 3 required significantly ($P<.05$) less feed per pound of gain than those on Treatment 1.
[3] Pigs on Treatment 3 had a significantly ($P<.10$) lower average daily feed intake than those on Treatment 1.

ed by other research workers for pigs consuming moldy grains. However, this does not appear to be a plausible explanation since pigs consuming the other two rations did not develop these symptoms. All three rations came from the same source of grain sorghum. The pigs apparent dislike for the micronized grain sorghum may be due to its extreme bulkiness. Average density for the micronized grain sorghum was approximately only 25 pounds per bushel.

Average daily gains were identical, 1.56 pounds per day, for the gilts on Treatments 1 and 3. However, pigs on Treatment 3 (micronized-reground ration) required significantly less ($P<.05$) feed per pound of gain than those on Treatment 1 (ground ration). This is an improvement of approximately 6 percent. Average daily feed intakes tended to be less ($P<.10$) for the pigs on Treatment 3 as compared to those on Treatment 1. No significant differences were noted in probed backfat thickness.

These results suggest that more research needs to be conducted on the feeding of micronized grain sorghum to growing-finishing swine. The problems encountered in feeding the micronized grain sorghum ration is not understood. The improvement observed in feed efficiency for the pigs fed the micronized-reground ration as compared to those fed the ground ration may not be economically feasible when the cost of processing is considered.

The Relationship of Various Factors with Ovulation Rate and the Number of Embryos 30-Days Postbreeding in Gilts

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Story in Brief

Size of litter born and weaned, birth and weaning weights, postweaning average daily gain, age at 220 lbs. and age and weight at breeding were collected on 241 purebred Duroc, Hampshire and Yorkshire gilts and 103 two-breed cross gilts resulting from all possible crosses among the purebreds. Gilts were slaughtered 30-days postbreeding and their reproductive tracts were removed to evaluate ovulation rate and early embryo development.