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# High Moisture Milo For Swine

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## Story In Brief

Two trials were conducted to evaluate the relative merit of ground, reconstituted-rolled and dry rolled milo-soybean diets for growing-finishing swine.

In trial number 1, no significant differences in rate of gain or feed utilization were obtained among pigs fed the three milo treatments. However, pigs fed the ground milo diet tended to require less feed per pound of gain than pigs fed the reconstituted-rolled or dry rolled milo diets.

In trial two, pigs fed the reconstituted diet required significantly less feed per pound of gain and consumed significantly less feed per day than pigs fed the ground or dry rolled milo diets. No significant differences in average daily gain were noted among pigs fed the three diets, but pigs fed the ground milo diet tended to gain faster than pigs fed the reconstituted-rolled or dry rolled milo diets.

## Introduction

Methods of processing are continuously being studied in an attempt to improve the feeding value of cereal grains and performance of swine. Recently, high moisture reconstitution has been compared with dry pro-

cessing methods as a means of improving rate of gain and feed utilization. A substantial improvement in feedlot performance has been obtained with cattle fed reconstituted milo as compared to dry milo. Preliminary trials involving growing-finishing swine have shown that pigs fed reconstituted or high moisture harvested grain diets required less feed per pound of gain than pigs fed dry grain diets.

Since milo has been the traditional swine feed in Oklahoma, two trials were conducted to study the effects of feeding reconstituted, high-moisture-rolled, ground or dry rolled milo to swine. The performance of pigs on each trial was used to compare the three processing methods.

## Materials and Methods

In trials 1 and 2, 42 and 48 purebred Yorkshire and Hampshire pigs were self-fed in confinement 52.8 and 91.1 days from an average weight of 120 to 203.7 pounds and from 57.8 to 211.3 pounds, respectively. Trials 1 and 2 were conducted during the summer and winter of 1969, respectively. The pigs were obtained from the Oklahoma State University swine herd and were randomly allotted within breed, sex and weight to three treatments.

The pigs were fed 16 percent crude protein, milo-soybean meal diets in two-pig, 6' x 7' feeding pens with concrete floors. The experimental diets were identical except for the preparation of the milo. The milo was either ground, reconstituted and rolled or dry rolled before mixing into the complete ration, shown in Table 1.

Table 1. Ration Composition<sup>1</sup>

Ingredient	Percent
Milo	76.98
Soybean Meal (50%)	19.67
Calcium carbonate	0.50
Dicalcium phosphate	1.85
Trace mineral salt <sup>2</sup>	0.50
Premix 8650A <sup>3</sup>	0.50
	Total
Five pounds of antibiotic supplement <sup>4</sup> were added per ton of ration	100.00

<sup>1</sup> Ration composition based on a 90% dry matter basis.

<sup>2</sup> Trace mineral salt supplied 12.5 ppm manganese, 10 ppm iron, 5 ppm sulfur, 1.65 ppm copper, 0.5 ppm cobalt, 0.35 ppm iodine and 0.25 ppm zinc per pound of diet.

<sup>3</sup> Premix 8650A supplied 1000 I.U. vitamin K, 100 I.U. vitamin D, 1.1 mg. riboflavin, 10 mg. niacin, 3.15 mg. pantothenic acid, 52.5 mg. choline, 7.5 mcg. vitamin B<sub>12</sub>, 1.2 ppm iodine, 11 ppm manganese, 22 ppm iron, 2.5 ppm copper, 0.3 ppm cobalt and 72.2 ppm zinc per pound of diet.

<sup>4</sup> Antibiotic supplement contained 20 gm. aureomycin, 10 gm. sulfamethazine and 20 gm. penicillin per pound.

The reconstituted-rolled milo was prepared by adding 15 gallons of warm water to 200 pounds of air-dry, whole milo. This mixture was allowed to mix for 45 to 50 minutes in a cement mixer to raise the moisture level of the milo to 30-32 percent. The grain was sacked in plastic airtight bags and stored for 21 days. After this time the milo was removed from the bags, rolled between 18" x 24" rollers with a 0.001 inch roller tolerance, mixed, resacked and placed in a 34°F. cooler until fed.

Ground milo was prepared by using a hammermill with a 0.1875 inch screen. Dry rolled milo was prepared by rolling the grain between 18" x 24" rollers with a 0.001 inch roller tolerance.

The complete reconstituted-rolled, ground and dry rolled milo-soybean diets contained approximately 74.07, 87.17 and 84.32 percent dry matter, respectively.

## Results and Discussion

The results of Trial 1 are shown in Table 2. The data suggested that the preparation methods used did not significantly effect daily gain, daily feed intake or feed per pound of gain. As shown in Table 2 the daily gains of pigs fed the ground or dry rolled milo diets tended to be superior to those of pigs fed the reconstituted milo diet. Pigs fed the ground diet tended to eat less and to be more efficient than pigs fed the high moisture or dry rolled diets.

The results of Trial 2 are shown in Table 3. No significant differences were obtained for rate of gain of pigs fed the three diets, but feed utilization was significantly improved for pigs fed the reconstituted milo diet. As shown in Table 3 pigs fed the ground milo diet tended to gain

Table 2. Effect of Reconstituted Milo on Performance of Finishing Swine

Item	Ration Designation		
	1 medium grind	2 reconstituted rolled	3 dry rolled
Pens per treatment, no.	7	7	7
Pigs per pen, no.	2	2	2
Average initial weight, lb.	122.9	119.4	120.4
Average final weight, lb.	204.3	202.6	204.1
Average daily gain, lb	1.75	1.67	1.64
Average daily feed intake, lb. <sup>1,2</sup>	5.94	5.08	5.90
Feed per pound of gain, lb. <sup>1,2</sup>	3.08	3.33	3.42

<sup>1</sup> Values shown were corrected to a 90 percent dry matter basis.

<sup>2</sup> No significant differences ( $P > .05$ ) between treatment means.

Table 3. Effect of Reconstituted Milo on Performance of Growing-Finishing Swine

Item	Ration Designation		
	1 medium grind	2 reconstituted rolled	3 dry rolled
Pens per treatment, no.	8	8	8
Pigs per pen, no.	2	2	2
Average initial weight, lb.	61.0	57.9	54.6
Average final weight, lb.	212.3	210.6	210.9
Average daily gain, lb.	1.75	1.67	1.64
Average daily feed intake, lb. <sup>1,2</sup>	5.94 <sup>2</sup>	5.08 <sup>1</sup>	5.90 <sup>2</sup>
Feed per pound of gain, lb. <sup>2</sup>	3.37	3.01 <sup>1</sup>	3.54 <sup>2</sup>

<sup>1</sup> Values shown were corrected to a 90 percent dry matter basis.

<sup>2</sup> Any two treatment means without a common number differ significantly ( $P \leq .05$ ).

faster than pigs fed the reconstituted or dry rolled milo diets. Pigs fed the reconstituted diet required less feed per pound of gain and consumed less feed than pigs fed the ground or dry rolled milo diets. Part of the improvement in feed utilization of pigs fed the reconstituted diet appeared to be due to less feed wastage.

The data obtained from these two studies are inconsistent in that improvement in efficiency of gain was obtained only in Trial 2. Reasons for this inconsistency were not elucidated. It is noteworthy, however, that Trial 1 was conducted during the summer months when spoilage was a problem whereas trial 2 was conducted during winter.

Additional studies with high moisture milo for swine are currently being conducted.