

greater stress when confined to the farrowing crates prior to farrowing and two sows in treatment 3 died prior to farrowing.

The results of daily hand feeding compared to hand feeding 3-times weekly are given in Table 2. Although there were no significant differences between the treatments, there was a trend for the daily fed sows to farrow more live pigs (11.1 pigs/litter) than the three times a week fed sows (10.2 pigs/litter). The differences between trials were significant, but the relative differences between treatments within each trial were similar.

These results suggest that no drastic reduction in productivity occurs when sows were fed only three times a week instead of daily. However, it was economically unfeasible to self-feed sows a high energy ration even when access to feeders was limited to 3 hours three days a week.

Effects of Levels of Protein and Lysine Supplementation To Wheat Rations For Growing-Finishing Swine

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Story in Brief

Two hundred eighty-eight pigs were fed during the winter of 1970-71 at the Fort Reno Livestock Research Station to evaluate different levels of protein and lysine supplementation to wheat rations as compared to a basal milo ration. The pigs were self-fed in confinement from an average weight of 56.0 pounds to 219.8 pounds.

The supplementation of L-lysine, or additional soybean meal, to increase the lysine level of wheat rations to 0.6 percent, or higher, improved average daily gains. A level of 0.6 percent lysine was as effective as 0.7 percent as measured by rate of gain for pigs fed wheat rations.

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Furthermore, this study demonstrated that a portion of the soybean meal in a 16 percent crude protein wheat ration could be effectively substituted with synthetic L-lysine. No significant differences were noted in feed efficiency, average daily feed intake, or probed backfat thickness among pigs fed any of the wheat rations or the milo ration.

Introduction

Wheat is often competitively priced with other cereal grains in Oklahoma to justify its use as a feedstuff in swine rations. Wheat, as other cereal grains, must be supplemented with additional protein to meet the essential amino acid requirements of swine if optimum performance is desired. The purpose of this study was to evaluate different levels of protein and lysine supplementation to wheat rations as compared to a basal-milo ration for growing-finishing swine. The study also explored the possibility of substituting synthetic lysine, one of the essential amino acids deficient in wheat, for a portion of the soybean meal normally included in a wheat ration for growing-finishing swine.

Experimental Procedure

Two hundred eighty-eight Hampshire x Duroc-Beltsville pigs were used in this study. The pigs averaging 56.0 pounds were randomly allotted within sex and litter to six experimental treatments. Each experimental treatment consisted of three replicates containing 16 pigs each (eight barrows and eight gilts). The pigs were housed and group-fed in indoor concrete pens equipped with self-feeders and automatic waterers. Pigs were individually removed from test and probed for backfat thickness on a weekly basis when they reached 220 pounds.

Composition of the experimental rations fed are shown in Table 1. The hard red winter wheat (Triumph variety) and milo analyzed 13.6 and 8.4 percent crude protein, respectively. Ration 1 was a 15.0 percent crude protein milo-soybean meal basal ration that calculated 0.79 percent lysine. Rations 2, 3, and 4 were 15.0 percent crude protein (0.50 percent lysine) wheat rations with 3 and 4 being supplemented with an additional 0.1 and 0.2 percent L-lysine, respectively. Rations 5 and 6 had additional soybean meal added at the expense of wheat to bring the crude protein levels to 16.0 and 17.0 percent, respectively. The additional soybean meal in Rations 5 and 6 made the total lysine level of these rations approximately equal to Rations 3 and 4. Thus, Rations 3 and 5 contained approximately 0.6 percent lysine and Rations 4 and 6 contained 0.7 percent lysine.

Table 1. Composition of Experimental Rations

Ingredients, percent	Ration number					
	1	2	3	4	5	6
Wheat, ground	---	88.10	87.80	87.50	85.00	81.70
Milo, ground	75.30	----	----	----	----	----
Soybean meal, 44%	19.70	6.90	6.20	5.50	10.10	13.40
Molasses	1.50	1.50	1.50	1.50	1.50	1.50
Dicalcium phosphate	1.50	1.40	1.40	1.40	1.30	1.30
Calcium carbonate	0.80	0.90	0.90	0.90	0.90	0.90
Salt	0.50	0.50	0.50	0.50	0.50	0.50
Vitamin-TM premix ¹	0.50	0.50	0.50	0.50	0.50	0.50
Tylan 10	0.20	0.20	0.20	0.20	0.20	0.20
Lysine mix	----	----	1.00	2.00	----	----
Total	100.00	100.00	100.00	100.00	100.00	100.00
Composition						
protein, %	15.00	15.00	15.00	15.00	15.00	15.00
lysine, %	0.79	0.50	0.60	0.70	0.59	0.69
calcium, %	0.70	0.70	0.70	0.70	0.70	0.70
phosphorus, %	0.60	0.60	0.60	0.60	0.60	0.60

¹ Vitamin-trace mineral premix supplied 1,500 IU Vitamin A, 150 IU Vitamin D₃, 2 mg. riboflavin, 15 mg. niacin, 10 mg. pantothenic acid, 500 mg. choline, 7.5 mcg. Vitamin B₁₂, 0.22 ppm iodine, 99 ppm iron, 22 ppm manganese, 11 ppm copper, and 99 ppm zinc per pound of feed.

Results and Discussion

The results of this experiment are presented in Table 2. Pigs on Treatment 2 (wheat-15 percent crude protein) gained significantly less than the pigs on the other treatments. The calculated low level of lysine (0.5 percent) in this ration appears to be the plausible explanation for the reduced gain. The pigs on the basal grain sorghum ration (Treatment 1) had the highest average daily gains and was significantly greater than those on the 15, 16, and 17 percent wheat rations (Treatments 2, 5, and 6 respectively).

It appears that the addition of synthetic lysine to raise the lysine content of Rations 2 and 4 to 0.6 and 0.7 percent, respectively, was effective in increasing gains. A level of 0.6 percent appeared to be as effective as 0.7 percent. Although the additional increase of soybean meal in Rations 5 and 6 to raise the lysine level to 0.6 and 0.7 percent, respectively, did increase gain, it did not appear to be as effective as was the addition of L-lysine in Rations 3 and 4. This suggests that the lysine in soybean meal may not be as available to the pig as synthetic L-lysine.

No significant differences were noted among treatments for feed required per pound of gain, average daily feed intake, or probed backfat thickness. However, pigs on Treatment 2 (wheat-15 percent crude protein) tended to have poorer feed conversion and lowered feed intake.

Table 2. Effect of Lysine and/or Soybean Meal Supplementation to Wheat Rations on Pig Performance

Treatment	1	2	3	4	5	6
	(15% milo)	(15% wheat)	(15% wheat + +.1% lys.)	(15% wheat + +.2% lys.)	(16% wheat)	(17% wheat)
No. pens per treatment	3	3	3	3	3	3
No. pigs per pen	16	16	16	16	16	16
Av. int. wt., lb.	55.9	57.0	55.7	55.0	56.8	55.5
Av. final wt., lb.	219.4	220.5	220.8	219.3	219.2	219.5
Av. daily gain, lb. ¹	1.71a	1.53	1.66ab	1.67acd	1.64bd	1.62bc
Feed per lb. gain, lb.	3.44	3.55	3.48	3.39	3.44	3.42
Av. da. feed intake, lb.	5.88	5.43	5.77	5.66	5.64	5.54
Av. adj. backfat, in.	1.28	1.25	1.27	1.24	1.23	1.22

¹ Any two means without a common superscript differ significantly ($P < .05$).

Feedlot Performance, Probe Backfat Thickness And Carcass Merit For Purebred And 2-Breed Cross Pigs

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This study included 206 purebred and 409 2-breed cross barrows and gilts of the Duroc, Hampshire and Yorkshire breeds. Growth rate data on all pigs, probe backfat thickness from 301 gilts and slaughter data on 96 barrows were analyzed to compare crossbreds to 2-breed cross pigs. Crossbred pigs gained 0.14 lb. per day faster from weaning to 220 lbs. and required 11 days less to reach 220 lbs. The overall differences in feed efficiency and probe backfat between crossbreds and purebreds were not significant, although crosses involving Durocs were less fat than the average of the breeds making up the cross. Although more comparisons are needed before one can make definite conclusions regarding differences among specific crosses, the preliminary results tend to support the general

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