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LYSINE AND PROTEIN SUPPLEMENTATION OF BARLEY RATIONS  
FOR GROWING-FINISHING SWINE

J. W. McCarty, R. C. Wahlstrom and Albert Dittman

Barley is an important crop for north central South Dakota. It is higher in protein content than corn, ranging from 11 to 15 percent. However, it is lacking in adequate quantities of the amino acid lysine to support normal growth of growing-finishing pigs. A series of trials have been conducted at the North Central Substation, Eureka, using barley as the only grain in rations for growing-finishing swine. These trials have indicated a moderate improvement in gain and feed efficiency when barley-soybean meal rations have been supplemented with lysine.

The objective of the experiment reported herein was to study the influence of lysine in the drinking water when pigs were fed a barley ration without additional protein and to compare this ration with barley-soybean meal rations of low (12%) and high (16%) protein content.

Procedure

One hundred forty-four SPF crossbred barrows and gilts were assigned to two replicates of four treatments. Allotment balanced sex, litter and weight among the pigs, all of which were by one sire. Pigs were grown out in one-third acre pasture lots equipped with portable houses, self-feeders and hog fountains. All rations were complete ground mixtures. Composition of the rations is shown in table 1.

Results and Discussion

Performance for pigs in this trial is summarized in table 2. Although pigs were fed in eight lots, two lots per treatment, data have been combined because lot differences were small, emphasizing the treatments which were studied.

The value of lysine in barley rations was quite clearly demonstrated in this experiment. Pigs fed the unsupplemented barley ration but receiving 4 gm. of lysine per gallon of water gained an average of 0.2 lb. per day faster than those fed the same ration but without lysine in their drinking water (1.69 vs. 1.49 lb. per day). These pigs receiving lysine also gained slightly faster than those pigs fed the low protein barley-soybean meal ration and nearly equal to those fed the high protein barley-soybean meal ration. These data would indicate that for pigs of the weight used in this trial barley is deficient in lysine but probably adequate in other amino acids. It also points out the possibility of decreasing needs of protein supplemental feeds for swine in the future if amino acid, particularly lysine, costs are reduced to where they would be economical to use in swine rations.

Table 1. Composition of Rations

Rations	No protein Grower and finisher	Low protein		High protein	
		Grower	Finisher	Grower	Finisher
Treatment	1 and 2 <sup>a</sup>	3		4	
<u>Feed ingredients<sup>b</sup></u>					
Barley	975	932	956	823	908
Soybean oil meal (44%)	0	40	20	150	70
Dicalcium phosphate	10	15	11	15	11
Ground limestone	7	5	5	5	4
Trace mineralized salt (high zinc)	5	5	5	5	5
Vitamin-antibiotic premix <sup>c</sup>	2.5	2.5	2.5	2.5	2.5

<sup>a</sup> Per 1000 pounds ground mixture.

<sup>b</sup> Lysine provided in drinking water at the rate of 4 gm. per gallon.

<sup>c</sup> Each pound of premix provided 0.6 gm. penicillin, 3 gm. streptomycin, 600,000 U.S.P. units vitamin A, 60,000 U.S.P. units vitamin D<sub>2</sub>, 400 mg. riboflavin, 1000 mg. d-pantothenic acid, 3000 mg. niacin, 23,044 mg. choline, and 3 mg. vitamin B<sub>12</sub> activity.

Grower ration supplied until the lot averaged approximately 110 pounds live weight.

Table 2. Performance of Pigs Fed Barley Rations With Different Levels of Protein Supplementation

	High protein	No protein	No protein + lysine	Low protein
Pigs per treatment	36	36	36	36
Av. initial wt., lb.	68.1	67.2	66.6	67.4
Av. final wt., lb.	206.9	197.2	210.5	204.1
Av. daily gain, lb.	1.71	1.49	1.69	1.63

Note: Feed consumption and efficiency data were not available for this summary.