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Abstract

Feeding trials involving each sex (boars, barrows and gilts) of finishing-weight pigs were conducted to determine the value of adding lysine to the rations. Rations containing 0.55% lysine were adequate for performance (rate of gain and feed/gain ratio) and carcass parameters (loin eye area, backfat thickness, length, and percentage of lean cuts) in all sexes.; Swine Day, Manhattan, KS, November 14, 1974

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Lysine Supplemented Rations for Boars, Barrows and Gilts

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Summary

Feeding trials involving each sex (boars, barrows and gilts) of finishing-weight pigs were conducted to determine the value of adding lysine to the rations. Rations containing 0.55% lysine were adequate for performance (rate of gain and feed/gain ratio) and carcass parameters (loin eye area, backfat thickness, length, and percentage of lean cuts) in all sexes.

Introduction

Finishing rations supplemented with lysine fed to pigs reportedly improves their rate and efficiency of gain, improves loin eye area, decreases backfat thickness, and increases lean cut yield. The majority of this work has been conducted without regard to sex differences of the pigs. It is well documented that boars and gilts are leaner and more heavily muscled than barrows, that, barrows consume more feed and are less efficient than boars or gilts, and that boars usually grow faster and more efficiently than gilts. Therefore, the objective of this study was to determine if adding lysine to rations already adequate in lysine would result in improved performance and carcass parameters for boars, barrows, and gilts.

Procedure

Feeding trials involving 60 pigs--20 of each sex (boars, barrows and gilts) were initiated as the pigs weighed approximately 110 lbs. Groups of 20 pigs (one sex) were housed in dry lots and fed in individual feeding stalls. Water was available at all times except at feeding time. Pigs were fed twice daily, semi ad libitum.

Boars and gilts were fed rations containing 0.55, 0.65, 0.75, or 0.85% lysine; barrows 0.45, 0.55, 0.65, or 0.75% lysine. Basal rations (containing 0.45% lysine or 0.55% lysine) are presented in table 1.1. Synthetic L-lysine·HCl was added to each basal ration to obtain the desired lysine levels. Amino acid analysis of the milo used is given in table 1.2.

When barrows and gilts reached 220 lbs., we obtained these carcass data: backfat thickness, loin eye area, carcass length, and percentage of lean cuts per carcass weight. Boars were scanned at 220 lbs. to estimate backfat thickness and loin eye area; in addition, six readings of backfat depth were taken: approximately 2 inches off the midline at the 1st , 4th, 8th and, 12th ribs; 3rd and last lumbar vertebrae.

Ham fat depth was measured on the side of the ham at the point of the greatest bulge. These measurements, along with the weight of each pig were used to calculate predicted lean cut percentages as follows:

$$\% \text{ LC} = 65.6 + 0.02(\text{weight}) - 2.24(\text{sum backfat}) - 3.75 (\text{ham fat}).$$

Table 1.1. Composition of Basal Rations[ab], Individual Feeding Trials

Ingredients	0.45% lysine	0.55% lysine
Milo	86.5	82.8
Soybean meal (44%)	9.8	13.5
Dicalcium phosphate	1.9	1.9
Ground limestone	0.3	0.3
Salt	0.5	0.5
VTM premix	1.0	1.0

[a]Rations pelleted.

[b]Crude protein = 12.00% (for 0.45% lysine) and 13.30% for 0.55% lysine).

Table 1.2. Amino Acid Composition of Milo[a], Individual Feeding Trial

Amino acids	Percent
Lysine	0.199
Threonine	0.313
Isoleucine	0.346
Leucine	1.258
Arginine	0.336
Valine	0.418
Histidine	0.217
Phenylalanine	0.487

[a]Crude protein = 8.9%.

Results and Discussion

Boar performance. No significant differences were found in average daily gain or in feed/gain of boars fed rations containing 0.55 to 0.85% lysine (table 1.3). No trend was noted which suggests finishing rations containing 0.55% lysine were adequate for boars. Estimated carcass data indicated that boars did not differ significantly in backfat thickness, loin eye area, or percentage of lean cuts due to treatment. Loin eye area of boars fed 0.65, 0.75 or 0.85% lysine, however, tended to be larger than that of boars fed 0.55% lysine.

Gilt performance. Table 1.4 presents performance and carcass data of the individually fed gilts. No significant differences or trends were noted in rate of gain or feed/gain ratio as lysine level of the ration was increased. Backfat thickness, length, or percentage of lean cuts of the gilts did not vary by treatment. But loin eye area in gilts fed 0.75% lysine was significantly smaller than that in gilts fed 0.85% lysine, probably because of animal variation (in that loin eye area from gilts fed 0.85% lysine was not significantly different than those from gilts fed 0.55% or 0.65% lysine).

Barrow performance. Although barrows fed 0.55% lysine gained significantly slower than did barrows fed 0.65 or 0.75% lysine, their gains were not significantly different from those barrows fed 0.45% (table 1.5). Barrows fed 0.45% lysine and those fed 0.65 or 0.75% lysine gained similarly which suggests that lysine added to the rations did not improve barrow performance.

Barrows receiving 0.65% lysine in their rations were longer than barrows receiving 0.45% lysine. However, length of barrows receiving 0.45% lysine

was not significantly different from that of barrows receiving 0.55 or 0.75% lysine. In general, barrows fed 0.55 to 0.75% lysine tended to have larger loin eye area and a greater percentage of lean cuts than did barrows fed 0.45% lysine. No differences were noted in backfat thickness.

Table 1.3. Performance and Carcass Parameters of Individually Fed Boars[a]

Indicated item	Lysine, % 0.55	0.65	0.75	0.85
Performance:				
No. boars	5	5	5	5
Avg. daily gain, lbs.	1.80	1.73	1.74	1.74
Daily feed intake, lbs.	5.30	5.26	5.10	5.00
Feed/gain	2.94	2.96	2.94	2.88
Estimated carcass data:				
Backfat, in.	.91	.95	.84	.90
Loin eye, sq. in.	5.01	5.39	5.16	5.54
Lean cuts (carc. wt.),%	61.4	60.5	61.6	61.9

[a]Initial weight 120 lbs.; final weight, 230 lbs.

Table 1.4. Performance and Carcass Parameters of Individually Fed Gilts[c]

Indicated item	Lysine, % 0.55	0.65	0.75	0.85
Performance:				
No. gilts	5	5	5	5
Daily gain, lbs.	2.07	2.05	1.98	2.05
Daily feed, lbs.	5.98	5.81	5.94	5.81
Feed/gain	2.90	2.84	3.01	2.84
Carcass data:				
Backfat, in.	1.21^{ab}	1.18^{ab}	1.10^{b}	1.18^{a}
Loin eye, sq. in.	5.76^{ab}	6.04^{ab}	5.08^{b}	6.25^{a}
Length, in.	30.7	30.6	31.1	30.4
Lean cuts (carc. wt.),%	61.6	61.5	60.5	60.9

[ab]Means with different superscript letters on the same line are statistically different (P<.05).

[c]Initial weight 115 lbs.; final weight, 230 lbs.

Table 1.5. Performance and Carcass Parameters of Individually Fed Barrows[c]

Indicated item	Lysine, % 0.45	0.55	0.65	0.75
Performance:				
No. barrows	5	5	5	5
Daily gain, lbs.	2.02	1.89	2.13	2.09
Daily feed intake, lbs.	6.64^{a}	5.96^{a}	6.08^{a}	6.80^{a}
Feed/gain	3.29^{a}	3.16^{a}	2.85^{a}	3.26^{a}
Carcass data:				
Backfat, in.	1.33	1.34	1.31	1.28
Loin eye, sq. in.	4.25	4.74	4.91	4.93
Length, in.	29.8^{b}	30.3^{ab}	31.0^{a}	30.5^{ab}
Lean cuts (carc. wt.),%	56.8	58.7	59.0	58.6

[ab]Means with different superscript letters on the same line are statistically different (P<.05).

[c]Initial weight 115 lbs.; final weight, 230 lbs.