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Feeding barrows and gilts three protein sequences to heavier market weight

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Summary

Forty-eight Yorkshire barrows and 48 Yorkshire gilts were fed separately three protein sequences to a finish weight of 250 to 260 lbs. Barrows gained faster and were more efficient on protein sequence B (16% protein diet from 100 to 135 lbs.; then 14% diet to finish weight) and C (same as B except that barrows were switched at 210 lbs. to a 12% diet to final weight) than on A (16% protein diet from 100 lbs. to final weight). Gilts gained fastest and were most efficient when fed sequence A. Both barrows and gilts gained slower after attaining the weight of 215 lbs., ate less feed per day, and required more than 4 lbs. of feed per pound of gain from 215 to 250+ lbs. Carcasses of barrows, regardless of protein sequences, were similar in backfat, loin eye, and length.

Introduction

In a 1976 study, we used mixed lots of barrows and gilts to evaluate the feasibility of feeding hogs to 260 or 290 lbs. as a terminal weight. Data from that study (reported on page 37 in the 1976 Swine Industry Day Report of Progress 283) suggested that to produce each 30 pounds of additional weight required 20 to 25 days, with more pounds of feed required per pound of gain, resulting in carcass with slightly more backfat thickness. Because barrows have a greater average

daily feed intake than gilts, this study was initiated to evaluate three sequences of dietary protein for carrying gilts or barrows, fed separately, to a heavier market weight (260 lbs.).

Procedure

Forty-eight Yorkshire gilts and 48 Yorkshire barrows from the same farrowing group were allotted, separately on the basis of weight, to 12 pens, six pens per sex (two replications of three treatments). We evaluated three protein sequences: (A) a fortified diet of 16% protein corn-soybean meal fed to pigs weighing 100 lbs. until they weighed 260 lbs.; (B) a fortified diet of 16% protein corn-soybean meal fed to pigs weighing 100 lbs. until they weighed 135 lbs., when they were switched to 14% protein diet until they weighed 260 lbs.; and (C) a fortified diet of 16% protein corn-soybean meal, fed to pigs weighing 100 lbs. until they weighed 135 lbs., when they were switched to 14% protein diet until they weighed 210 lbs., and then to a 12% protein diet until they weighed 260 lbs. Composition of the diets is shown in table 10. All diets were fed in pelleted form.

Table 10 . Composition of diets.

Protein level, %	16	14	12
<u>Ingredient, lbs./ton</u>			
Corn	1512	1618	1732
Soybean meal (44%)	420	314	200
Dicalcium phosphate	18	18	18
Limestone	20	20	20
Salt	10	10	10
VATM-premix ^{abc}	20	20	20
<u>Calc. analysis:</u>			
Protein, %	16.0	14.0	12.0
Ca, %	.62	.60	.58
P, %	.54	.52	.50
Lysine, %	.75	.60	.45
Ration cost/lb., ¢	7.4	7.0	6.5

^aProvided per ton of complete diet: Vit. A, 4,000,000 IU; Vit. D, 300,000 IU; Vit. E, 200,000 IU; Riboflavin, 45 g; Niacin, 25 g; pantothenic acid, 12 g; Vit. B₁₂, 22 mg.

^bTrace mineral in complete diet (ppm): Zinc 100; iron 100; manganese, 100; copper, 10; iodine, 3; cobalt, 1.

^cAntibiotic - provided 40 g of tyran per ton.

Pigs were housed in a modified, open-fronted building with concrete, slatted floors. Each pen (6' x 16') contained a two-hole self feeder with an automatic watering cup. A catalytic heater provided supplemental heat.

In the first replicate of treatments, all barrows in a pen were slaughtered for carcass data when the pen averaged between 250 and 260 lbs.

Results and Discussion

Performance of the gilts, at weights from 100 to 215 lbs., is presented in table 11 . Their average daily gain was similar for the three dietary sequences during this growth period. Feed efficiency favored the gilts fed only the 16% diet A, which resulted in a cost-of-gain of 22.1¢ per lb. Gilts fed B or C were less efficient, resulting in cost-of-gain of 23.9¢ and 23.0¢, respectively.

Table 11 . Performance of gilts fed one of three protein sequences during various stages of growth.

Sequence:	A	B	C
Protein, %	16-16-16	16-14-14	16-14-12
<u>Performance from 100 to 215 lbs.</u>			
Avg. daily gain, lbs.	1.78	1.71	1.72
Feed/gain	2.99	3.20	3.29
Cost of gain, ¢/lb.	22.1¢	23.9¢	23.0¢
<u>Performance from 215 to 240 lbs.</u>			
Avg. daily gain, lbs.	1.50	1.45	1.35
Feed/gain	4.02	4.07	4.00
Cost of gain, ¢/lb.	29.7¢	28.5¢	26.0¢
<u>Performance from 240 to 260 lbs.</u>			
Avg. daily gain, lbs.	1.24	1.20	1.18
Feed/gain	4.30	4.41	4.59
Cost of gain, ¢/lb.	31.8¢	30.9¢	29.8¢
<u>Performance from 215 to 260 lbs.</u>			
Avg. daily gain, lbs.	1.39	1.36	1.28
Feed/gain	4.14	4.22	4.26
Cost of gain, ¢/lb.	30.6¢	29.5¢	27.7¢

Reduced rate of gain was observed, for all treatment groups, for pigs weighing 215 lbs. to final weight; however, those gilts receiving the 16% diet (A) throughout the trial continued to gain the fastest and were the most efficient (3%). Gilts fed C had the greatest depression in gain and required the most lbs. of feed per pound of gain; however, feed cost per pound of gain favored the C group because of lower cost per pound of ration. For all treatment groups, feed/gain ratio increased as gilts were fed beyond weights of 215 lbs.

Performances of the barrows from 100 to 215 lbs. are presented in table 12. Average daily gain and feed efficiency of those barrows fed B or C were improved, which resulted in a cheaper cost of gain. Barrows fed B or C continued to gain faster from 215 to 250+ lbs.; however, the pounds of feed required per pound of gain favored those barrows fed the 14% protein to final weight. Barrows receiving the 16% diet throughout the feeding period gained slower and were the least efficient, which resulted in the greatest cost per pound of gain.

From 215 to 250+ lbs., all barrows gained at a slower rate and required 4 lbs. of feed per pound of gain. The reduced performance in gain and efficiency is similar to that observed in the 1976 feeding trial. In both trials the average daily feed intake was reduced for no apparent reason other than that the pigs seemed to be more lethargic.

Table 12. Performance of barrows fed one of three protein sequences during various stages of growth.

Sequence: Protein, %	A 16-16-16	B 16-14-14	C 16-14-12
<u>Performance from 100 to 215 lbs.</u>			
Avg. daily gain, lbs.	1.83	1.85	1.90
Feed/gain	3.37	3.27	3.18
Cost of gain, ¢/lb.	24.9¢	23.2¢	22.5¢
<u>Performance from 215 to 240 lbs.</u>			
Avg. daily gain, lbs.	1.41	1.61	1.51
Feed/gain	4.21	3.98	4.88
Cost of gain, ¢/lb.	31.2¢	27.9¢	31.7¢
<u>Performance from 240 to 260 lbs.</u>			
Avg. daily gain, lbs.	1.08	1.33	1.32
Feed/gain	4.64	4.01	3.93
Cost of gain, ¢/lb.	34.3¢	28.1¢	25.5¢
<u>Performance from 215 to 260 lbs.</u>			
Avg. daily gain, lbs.	1.25	1.49	1.43
Feed/gain	4.34	4.00	4.51
Cost of gain, ¢/lb.	32.1¢	28.0¢	29.3¢

Table 13 summarizes the performances of barrows and gilts for the entire feeding period. Barrows fed sequences B and C gained 7.5% faster and were 4.7% more efficient than barrows fed the 16% diet. Pigs fed B and C performed similarly, with equal cost per pound of gain. Gilts fed 16% throughout the feeding period gained 4.3% faster and were approximately 6 to 10% more efficient than gilts fed either B or C. Because of the improved performance, the cost of gain still

avored the 16% diet (A), even though the ration cost per pound was higher than for either of the other sequences (B or C).

Table 13 . Performance of barrows and gilts fed three protein sequences from 100 to 250+ lbs.

Sequence: Protein, %	A 16-16-16		B 16-14-14		C 16-14-12	
	Barrows	Gilts	Barrows	Gilts	Barrows	Gilts
No. of pigs	16	16	16	16	16	16
Avg. daily gain, lb.	1.62	1.66	1.76	1.58	1.74	1.59
Avg. daily feed, lb.	5.85	5.43	6.07	5.51	6.00	5.72
Feed/gain	3.62	3.27	3.45	3.49	3.44	3.60
Cost of gain,	26.8¢	24.2¢	24.5¢	25.4¢	24.4¢	24.3¢

Barrow carcass data are presented in table 14 . No significant differences were observed for the carcass traits of backfat thickness, loin-eye area, length, and percentage of lean cuts or ham and loin due to treatment.

Table 14 . Carcass data for barrows fed three protein sequences.^a

Sequence: Protein, %	A 16-16-16	B 16-14-14	C 16-14-12
Slaughter wt., lb.	251.0	258.0	255.0
Backfat, in.	1.35	1.29	1.38
Length, in.	32.3	32.7	32.2
Loin eye, sq. in.	5.06	5.07	5.06
Ham-loin, % carc. wt.	39.3	40.6	39.1
Lean cuts, % carc. wt.	55.9	58.8	56.8

^aAverage of eight pigs per treatment.