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EFFECT OF LEVEL OF BARLEY IN FINISHING DIETS ON SWINE PERFORMANCE AND CARCASS CHARACTERISTICS

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Barley continues to be a feed ingredient available to swine producers in South Dakota, that can be used as a substitute for corn. In experiments reported in the 1984 South Dakota Swine Day Proceedings we reported that pigs fed barley diets gained slower during the grower period (60 to 125 lbs) but not during the finisher period (125 to 220 lb). This experiment was designed to evaluate various levels of barley, 0 to 100% of the grain, in diets fed to pigs from an average of 80 to 220 lb market weight.

(Key Words: Barley Level, Pigs, Performance, Carcass Characteristics.)

Experimental Procedure

Ninety-six crossbred pigs were allotted to four replications of six treatments. Each pen consisted of two barrows and two gilts. Allotment to replication was on the basis of litter and pig weight. Initial weights averaged 91, 83, 78 and 70 lb for replicates 1 through 4, respectively. Pigs were housed in a slotted floor, enclosed confinement building.

The diets were formulated to be equal in lysine content. The grower diets contained .80% lysine and the finisher diets .61% lysine. Composition of the diets are shown in table 1. Experimental treatments varied in corn and barley as the grain components as follows:

1. 100% corn
2. 80% corn, 20% barley
3. 60% corn, 40% barley
4. 40% corn, 60% barley
5. 20% corn, 80% barley
6. 100% barley

The experiment, conducted during the months of December, January and February, was terminated by pens when pen average weights were approximately 220 lb. Pigs from two replicates were slaughtered at the South Dakota State University Abattoir. Dressing percentage, gastrointestinal tract weight, carcass backfat, pounds and percent lean and loin eye area were determined.

Table 1. Composition of Experimental Diets (%)

Ingredient	Diet to 125 lb.[a] 1	2	3	4	5	6
Ground yellow corn	79.95	61.25	46.25	31.05	15.65	--
Ground barley	--	15.3	30.9	46.7	62.75	79.1
Soybean meal, 44%	21.5	20.9	20.3	19.7	19.05	18.4
Dicalium phosphate	1.4	1.4	1.4	1.4	1.4	1.35
Limestone	.7	.7	.7	.7	.7	.7
Salt	.3	.3	.3	.3	.3	.3
Premix[b]	.15	.15	.15	.15	.15	.15
	Diet 125 to 220 lb.[c]					
Ground yellow corn	83.8	67.55	51.1	34.3	17.3	--
Ground barley	--	16.9	34.1	51.5	69.2	84.3
Soybean meal, 44%	14.0	13.35	12.6	12.0	11.3	10.55
Dicalcium phosphate	1.0	1.0	1.0	1.0	1.0	1.0
Limestone	.75	.75	.75	.75	.75	.7
Salt	.3	.3	.3	.3	.3	.3
Premix[b]	.15	.15	.15	.15	.15	.15

[a] Calculated to contain .8% lysine, .65% calcium and .60% phosphorus.

[b] Supplied trace minerals, vitamins and antibiotics.

[c] Calculated to contain .61% lysine, .55% calcium and .50% phosphorus.

Results

The results of the pig performance data are shown in table 2. During the grower period, pigs fed corn as the only grain gained from 3 to 6% faster than those pigs fed various levels of barley. However, the level of barley in the diet did not have a consistent effect on rate of gain as pigs fed 40 or 80% barley as the grain gained 1.79 and 1.78 lb/day, respectively, compared to 1.73, 1.72 and 1.72 lb for pigs fed 20, 60 or 100% barley. Feed efficiency was not different among treatments.

Similar differences in performance were noted during the finisher period as found in the grower period. For the combined grower-finisher period, pigs fed the diet with corn as the sole grain source gained faster ($P<.05$) than pigs fed 20 or 60% barley and non-significantly faster than those fed 40, 80 or 100% barley, 1.77 vs 1.67, 1.67 and 1.66 lb/day, respectively. Feed efficiency favored the corn diet but differences among treatments were not statistically significant.

Slaughter data presented in table 3 indicates a trend for decreased dressing percentage when pigs were fed 80 or 100% of these grain as barley. The decreased dressing percentage was related to increased gastrointestinal tract weight of pigs fed these two diets. Gut weight increased linearly ($P<.01$) as the percentage of barley increased. Pigs fed 80 and 100% barley as the grain had significantly ($P<.01$) heavier gut weights than pigs fed 0, 20 or 40% barley as the grain portion of their diet.

Table 2. Effect of Substitutions of Barley for Corn[a] on Performance of Growing-Finishing Swine

Corn, %	100	80	60	40	20	0
Barley, %	0	20	40	60	0	100
Grower (80 to 125 lbs)						
ADG	1.84[b]	1.73[c]	1.79[b,c]	1.72[c]	1.78[b,c]	1.72[c]
ADF	5.45	5.45	5.57	5.36	5.23	5.23
F/G	2.97	3.16	3.12	3.12	2.94	3.04
Finisher (125 to 225 lbs)						
ADG	1.73[b]	1.53[c]	1.62[b,c]	1.56[c]	1.62[b,c]	1.64[b,c]
ADF	6.88	6.49	6.49	6.75	6.76	7.12
F/G	4.02	4.25	4.05	4.33	4.17	4.36
Combined (80 to 225 lbs)						
ADG	1.77[b]	1.58[c]	1.67[b,c]	1.61[c]	1.67[b,c]	1.66[b,c]
ADF	6.43	6.19	6.21	6.34	6.27	6.54
F/G	3.68	3.91	3.74	3.95	3.77	3.94

[a] Four reps of 4 pigs each per treatment.

[b,c] Means without a common superscript differ ($P<.05$).

Summary

Ninety-six crossbred pigs averaging about 80 lb were fed diets containing barley substituted for corn in amounts of 0, 20, 40, 60, 80 or 100% of the grain portion of the diet.

There was no difference in performance of pigs fed 20 to 100% barley as the dietary grain portion. However, pigs fed corn as the sole grain source tended to gain faster than those fed diets containing various levels of barley. Pigs fed diets of 80 or 100% barley had a higher gastrointestinal trait weight

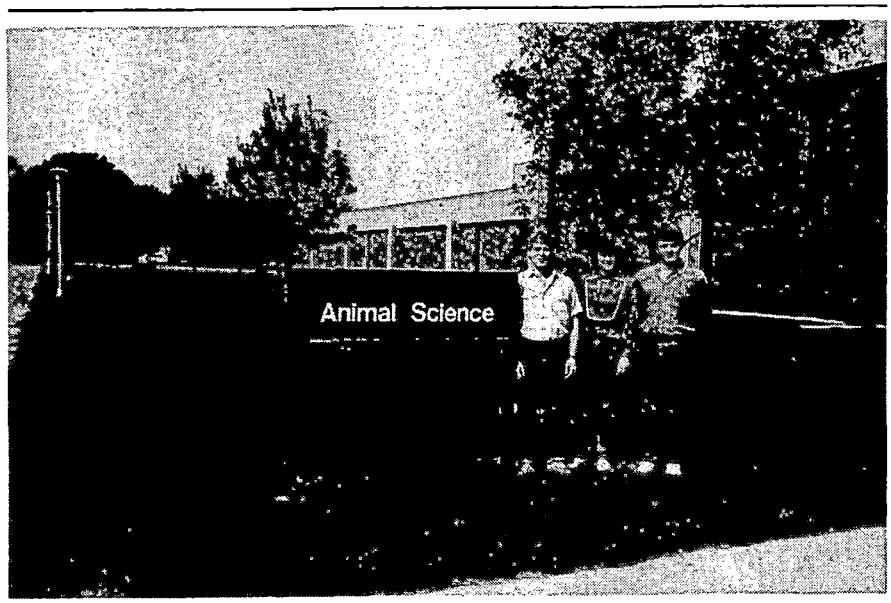
at slaughter and slightly decreased dressing percentages than pigs fed 0, 20 or 40% barley. The results were not conclusive as to the optimum level of barley in swine diets.

Table 3. Effect of Corn and Barley Levels on Carcass Characteristics

Corn, %	100	80	60	40	20	0
Barley, %	0	20	40	60	80	100
No. pigs	8	8	8	8	8	7
Dressing, %	70.2	70.9	71.0	70.4	69.4	68.7
Gut weight, lb[a]	21.5	22.2	19.5	23.6	25.2	25.3
10th rib fat, in.	.99	1.03	.99	1.00	.90	1.03
Loin eye area, sq. in.	4.49	4.34	4.41	4.48	4.61	4.41
Lb of lean[b]	85.4	84.5	84.9	85.4	86.7	84.3
Percent lean	53.4	52.8	53.1	53.4	54.2	52.7

[a] Linear effect ($P<.01$). Zero and 20% barley different from 80 and 100% barley, 40% barley different from 60, 80 and 100% barley.

[b] Adjusted to a 160 lb carcass basis.



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