

**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. <sup>1</sup>	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

<sup>1</sup> 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

R. K. Johnson, I. T. Omtvedt, R. R. Wilson and L. E. Walters

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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conclusion that crossbreeding does not greatly improve carcass merit over the average of the two breeds making up the cross.

## Introduction

Traits such as growth rate, backfat thickness and carcass traits are moderately to highly heritable and are not expected to exhibit much heterosis. Distinct breed differences for these traits are known, but information on specific crossing sequences or how to best combine breeds in a crossbreeding program are not known.

To obtain information on these questions, project 1444 was initiated to evaluate the general combining ability of Durocs, Hampshires and Yorkshires in 2-breed and 3-breed crosses. This paper reports feedlot performance and carcass merit data from pigs farrowed in 1971 spring in the first phase of this study where purebred and 2-breed cross pigs are compared. Because the data includes only one season and the number of animals within any breed group are rather limited, this paper will deal with only the overall differences between purebreds and crossbreds. The same breeding structure has been repeated and the additional data along with those reported here should provide sufficient numbers to compare differences between reciprocal crosses and to evaluate the influence of maternal effects in crossing sequences.

## Experimental Procedure

The data for this study includes the barrows and gilts produced in the Fort Reno swine breeding herd in the 1971 farrowing season. A total of 409 crossbred and 206 purebred pigs from 89 litters are included. The litters were produced by mating 6 boars from each of the Duroc, Hampshire and Yorkshire breeds to 2 gilts from his own breed and 2 gilts from each of the other 2 breeds.

All pigs were weaned at 6 weeks and moved to the confinement finishing facilities when they were 8 weeks old. The pigs were self-fed by breed in groups of about 16 pigs per pen until they reached 220 lbs. When the pigs were weighed off test, probe backfat measurements were made on each gilt.

At the time the pigs were weighed off test a random sample of 96 barrows were slaughtered and carcass cutout obtained at the University Meat Laboratory. In addition to standard carcass measurements, meat quality was evaluated by scoring the loins for marbling and firmness.

## Results

The comparison of purebred and 2-breed cross pigs for feedlot per-

**Table 1. Feedlot Performance and Probe Backfat Thickness for Purebred and 2-Breed Cross Pigs<sup>1</sup>**

Breed	No. Pigs	Daily Grain Lbs.	Days to 220 Lbs.	Feed/lb. Grain	Probe Backfat for Gilts in.
Durocs	69	1.39 <sup>a</sup>	181.7 <sup>a</sup>	3.16 <sup>a</sup>	1.47 <sup>a</sup>
Hamps	70	1.33 <sup>a</sup>	185.5 <sup>a</sup>	3.14 <sup>a</sup>	1.20 <sup>b</sup>
Yorks	67	1.36 <sup>a</sup>	186.1 <sup>a</sup>	2.82 <sup>a</sup>	1.22 <sup>b</sup>
Duroc-Hamp Cross	132	1.48 <sup>b</sup>	173.9 <sup>b</sup>	3.04 <sup>a</sup>	1.24 <sup>b</sup>
Duroc-York Cross	153	1.51 <sup>b</sup>	171.6 <sup>b</sup>	2.94 <sup>a</sup>	1.31 <sup>c</sup>
Hamp-York Cross	124	1.49 <sup>b</sup>	174.1 <sup>b</sup>	3.03 <sup>a</sup>	1.28 <sup>bc</sup>
Purebreds <sup>2</sup>	206	1.36 <sup>a</sup>	184.4 <sup>a</sup>	3.04 <sup>a</sup>	1.30 <sup>a</sup>
Crossbreds <sup>2</sup>	409	1.50 <sup>b</sup>	173.2 <sup>b</sup>	3.00 <sup>a</sup>	1.27 <sup>a</sup>

<sup>1</sup>Means in same column for a trait with different superscripts are significantly different from each other ( $P < .05$ ).

<sup>2</sup>Superscripts on overall means compare only crossbred and purebred overall means.

formance and probe backfat thickness is shown in Table 1. Crossbred pigs gained 0.14 lb. per day faster from weaning to 220 lbs. than purebreds and required 11 days less to reach 220 lbs. All crossbred groups gained significantly faster than did the average of the purebreds which made up the cross.

The differences in feed efficiency were not significant. Overall, crossbred pigs took 0.04 lbs. less feed per pound of gain than purebreds, however the Duroc-Hampshire cross required 0.11 lbs. less per pound of gain than the average for purebred Durocs and Hampshires. More data on feed efficiency are needed before any conclusions can be made.

Even though crossbred pigs averaged only 0.03 in. less backfat than purebreds, rather large differences were noted for certain crosses. Duroc-Hampshire crossbred pigs had significantly less backfat than the average of Duroc and Hampshire purebreds. Although non-significant, Hampshire-Yorkshire crossbred pigs had 0.07 in. more backfat than the average of purebred Hampshire and Yorkshires.

The data for the 96 purebred and crossbred pigs slaughtered are presented in Table 2. The numbers within any breed group are limited and consequently definite conclusions cannot be made. Carcass traits are generally moderate to highly heritable and would be expected to exhibit little heterosis and these data generally tend to support this conclusion. Significant heterosis was obtained for Duroc-Hampshire crossbred barrows for loin eye area, ham-loin index, marbling score and firmness score. There was also some evidence for positive heterosis for the Duroc-Yorkshire cross for percent lean cuts of live weight and marbling score, however Hampshire-Yorkshire crosses tended to have negative heterosis for percent lean of live weight and both quality scores. The small numbers

Table 2. Carcass Merit Comparisons of Purebred and 2-Breed Cross Barrows<sup>1</sup>

Breed	No. Carcasses	Length, in.	Backfat in.	Loin Area (in <sup>2</sup> )	Ham-Loin Index	% Lean Live Weight	Quality	
							Marbling <sup>3</sup>	Firmness <sup>4</sup>
Durocs	12	30.0 <sup>a</sup>	1.27 <sup>a</sup>	4.83 <sup>a</sup>	94.1 <sup>a</sup>	39.6 <sup>a</sup>	5.9 <sup>a</sup>	6.3 <sup>a</sup>
Hamps	12	30.7 <sup>b</sup>	1.10 <sup>b</sup>	4.84 <sup>a</sup>	98.2 <sup>a</sup>	41.1 <sup>b</sup>	2.8 <sup>b</sup>	3.5 <sup>b</sup>
Yorks	12	30.7 <sup>b</sup>	1.30 <sup>a</sup>	4.63 <sup>a</sup>	88.7 <sup>a</sup>	39.1 <sup>c</sup>	4.7 <sup>c</sup>	5.8 <sup>a</sup>
Duroc-Hamp Cross	20	30.4 <sup>ab</sup>	1.20 <sup>c</sup>	5.20 <sup>b</sup>	101.6 <sup>b</sup>	41.0 <sup>b</sup>	5.4 <sup>ac</sup>	5.6 <sup>a</sup>
Duroc-York Cross	20	30.8 <sup>bc</sup>	1.26 <sup>ac</sup>	4.76 <sup>a</sup>	93.2 <sup>a</sup>	40.2 <sup>d</sup>	5.8 <sup>a</sup>	6.1 <sup>a</sup>
Hamp-York Cross	20	30.7 <sup>bc</sup>	1.26 <sup>ac</sup>	4.70 <sup>a</sup>	90.2 <sup>a</sup>	39.6 <sup>a</sup>	3.2 <sup>b</sup>	4.0 <sup>b</sup>
Purebreds <sup>2</sup>	36	30.5 <sup>a</sup>	1.22 <sup>a</sup>	4.77 <sup>a</sup>	93.7 <sup>a</sup>	39.9 <sup>a</sup>	4.5 <sup>a</sup>	5.2 <sup>a</sup>
Crossbreds <sup>2</sup>	60	30.6 <sup>a</sup>	1.24 <sup>a</sup>	4.89 <sup>a</sup>	95.0 <sup>a</sup>	40.3 <sup>b</sup>	4.8 <sup>b</sup>	5.2 <sup>a</sup>

<sup>1</sup> Means for a trait in the same column with different superscripts are significantly different ( $P < .05$ ).

<sup>2</sup> Superscripts on overall means apply only to comparison of overall crossbred and purebred means.

<sup>3</sup> Scored on a scale of 1 to 7 (1 = devoid; 5 = average; 7 = abundant).

<sup>4</sup> Scored on a scale of 1 to 7 (1 = very soft; 5 = average; 7 = very firm).

and the failure of crosses to respond alike necessitates the collection of more data. Additional data are also needed in order to evaluate differences between reciprocal crosses.

In general these data indicate that crossbreds pigs gained faster in the feedlot than purebreds and exhibited significant heterosis for growth rate. A small amount of heterosis was obtained for certain carcass traits, however these data generally tend to support the conclusion that crossbreeding does not greatly improve carcass merit over the average of the parental breeds.