

good or better than the usual yearling ewes that are brought into Oklahoma for breeding purposes. The Panama ewes were purchased to determine how well ewes that were one-half Lincoln would breed for fall lambing. The Rambouillet-Merino ewes are similar in breeding to the fine wool Debouillet ewes of Texas and New Mexico.

These results clearly demonstrate that after the first year the Dorset X Western crossbred ewes (1) will lamb more readily during a lambing period from October 15 to November 25, (2) produce more twins, (3) raise at least as high a percentage of lambs born, (4) breed more readily from August 20 to September 19 if they do not conceive during late May and June and (5) produce lambs that are as heavy at birth, heavier at 70 days of age and that gain faster during the rest of the period to market than will the kind of Western ewes to which they were compared. They sheared less wool but it was usually worth more per pound as grease wool. The ewes are still being compared, therefore, a final conclusion as to expected years of production is not presently available.

The Effect of Sex on Feedlot and Carcass Traits in Swine*

*I. T. Omtvedt, C. M. Stanislaw, L. E. Walters, D. R. Rule and
P. J. Cunningham***

Swine producers have observed that barrows grow faster and reach market weight at an earlier age than gilts, but gilts tend to yield more desirable carcasses. However, the size of these differences between the performance of barrows and gilts has not been thoroughly investigated.

Significant sex differences could greatly affect the accuracy of records used in swine improvement programs. Boars possessing the ability to sire pigs with superior carcasses are selected on the basis of their progeny's slaughter test. However, unequal numbers of barrows and gilts are often included in samples for evaluating potential herd boars. If sex differences exist, then the progeny test information may be biased depending on the sex ratio tested.

The present study was initiated to investigate the magnitude of the differences in performance between barrows and gilts and to study the possible existence of interactions between sire and sex. A sire-sex interaction means that the difference in performance between barrows and gilts is not the same for the progeny of all sires.

*Conducted in cooperation with the Regional Swine Breeding Laboratory, AHRD, ARS, U.S.D.A.

**Grateful acknowledgement is made to D. F. Stephens, Superintendent, Ft. Reno Livestock Research Station, for his assistance and cooperation in making this trial possible.

Procedure

In the fall of 1964, 114 weanling barrow-gilt littermate pairs were allotted to a feeding test. The trial included 148 pigs at Ft. Reno and 80 pigs at Stillwater. Pigs were allotted to pens by sire and sex. An average of 4 pigs was fed in each pen with each sire having 2 pens of barrows and 2 pens of gilts. The lines of breeding and number of sire groups included in this trial are given in Table 1.

Pigs were self-fed, ground rations containing 16 percent protein from weaning to 120 lb. and 15 percent protein rations from 120 lb. to 200 lb. Equal parts of milo and wheat were used in the rations at Ft. Reno while milo served as the only grain in the Stillwater rations. Feed records were kept for each pen.

Pigs were removed from test at weekly intervals as they weighed 200 lb. At this time, all pigs were probed for backfat thickness and 2 pigs from each pen were randomly selected for the slaughter test. The pigs raised at Ft. Reno were slaughtered at Harris Meat Company, Oklahoma City, and those raised at Stillwater were slaughtered at the University Meat Laboratory.

The following carcass information was collected: length; backfat thickness; loin eye area at the 10th rib; weights of hams, loins and shoulders; and loin quality scores at the 10th rib. The cross section of the loin at the 10th rib was scored for marbling, color and firmness by a committee of 3 judges and the average of their scores was used in the analysis. The scoring system used for quality is given in Table 2.

Results and Discussion

Rate and Efficiency of Gain

The results for the 228 pigs evaluated are summarized in Table 3. Barrows gained 0.19 lb. per day faster and reached market weight of 200 lb. 12 days before their littermate gilts. In this trial, both sexes required approximately the same amount of feed per pound of gain, but the control of feed wastage was a problem at Stillwater and these records should be considered only as preliminary results.

Table 1. Lines of Breeding, Sire Groups, and Number of Pigs Evaluated

Line of Breeding	Description of Breeding	Location of Line	No. of Sires	No. of Pigs
OK14	Hamp. boars x Belts. No. 1—Duroc sows	Ft. Reno	8	148
OK32	Hampshire	Stillwater	4	64
14x8-9	Beltsville — Landrace — Poland cross	Stillwater	2	16

Line of breeding and sire differences were significant ($P < .01$) for both average daily gain and age at 200 lb. The 14x8-9 pigs at Ft. Reno made the most rapid gains and weighed 200 lb. at the youngest age. A sire-sex interaction was noted ($P < .025$) in the 14x8-9 line for average daily gain, but was not observed in the other 2 lines studied. The nature of this interaction is illustrated in Figure 1. In all sire groups the barrows outgained the gilts, but the differences between barrows and gilts ranged from 0.02 lb. per day to 0.25 lb. per day in the 8 sire groups included in the 14x8-9 line. The importance of this interaction will be more extensively studied in the next trial. However, the existence of this interaction would mean that both sexes need to be included to accurately evaluate the breeding value of a sire.

Probe Backfat Thickness

The backfat thickness is the only carcass trait that can be measured on the live animal. The probe is used in conjunction with visual appraisal to evaluate carcass merit of the live hog. The results summarized in Table 3 show that in this study gilts probed 0.13 in. less backfat than their littermate barrows. This difference was significant ($P < .01$) and was observed in all 3 lines of breeding studied. Sire differences were also noted, but the differences between barrows and gilts were relatively uniform within sire groups.

Table 2. Scoring System for Loin Quality.

Score	Description of Score		
	Marbling	Color	Firmness
1	Devoid	Extremely Pale	Very Soft
2	Scantily	Pale	Soft
3	Slightly	Slightly Pink	Slightly Soft
4	Average	Moderately Pink	Average
5	Moderately	Bright Pink	Slightly Firm
6	Well	Slightly Dark	Firm
7	Abundant	Dark	Very Firm

Table 3. Rate of Gain, Feed Efficiency and Probed Backfat.

Item	Line of Breeding			Average for all Pigs		
	14x8-9	OK14	OK32	Barrows	Gilts	Difference
No. Pigs	148	64	16	114	114	
Daily gain, lb.	1.72	1.44	1.45	1.72	1.53	0.19
Age at 200 lb., days	142	164	164	144	156	12
Feed per lb. gain, lb.	3.54	3.80	3.78	3.63	3.62	0.01
Probe backfat, in.	1.28	1.32	1.33	1.36	1.23	0.13

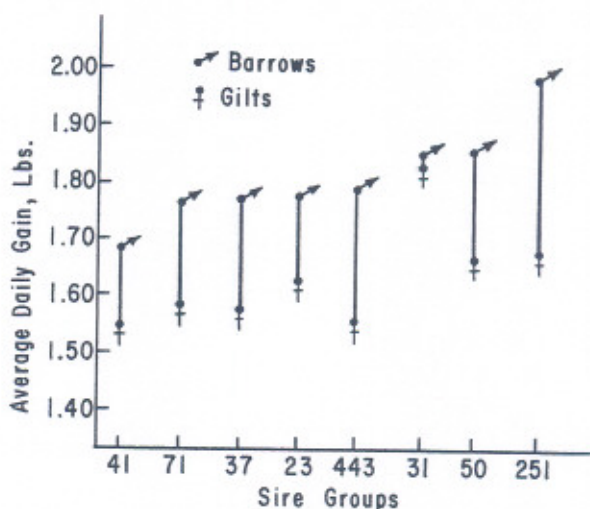


Figure 1 Differences between daily gains of 14x8-9 barrows and gilts within the eight sire groups tested.

Carcass Traits

The carcass measurements summarized in Table 4 show that gilt carcasses were 0.6 in. longer and had 0.10 in. less backfat, 0.44 sq. in. greater loin eye area, and 4.1 percent higher yield of lean cuts based on carcass weight.

Line of breeding and sire differences were noted for all measurements. In the OK 14 line, a significant ($P < .01$) sire-sex interaction was obtained for loin eye area. Gilts had larger loin eye areas than barrows for all sire groups, but the interaction resulted from the fact that differences between barrows and gilts ranged from 0.1 sq. in. to 0.9 sq. in. for the 4 sire groups evaluated in this line.

This is a small sample of sires and further investigations are needed before the significance of this interaction can be completely evaluated. However, if sire-sex interactions are important for loin eye area, both barrows and gilts will need to be included in the progeny test.

Loin Quality

Presently very little emphasis is placed on quality of meat in evaluating pork carcasses. However, increased incidences of soft, watery pork have been noted by various segments of the industry. The growing concern regarding this problem has recently stimulated research on possible causes of low quality pork, but the effect of sex on pork quality has not been investigated.

Table 4. Carcass Measurements and Quality Scores.

Item	Line of Breeding			Average of all Carcasses		
	14x8-9	OK14	OK32	Barrows	Gilts	Difference
No. Carcasses	60	32	8	50	50	
Length, in.	30.2	29.2	29.8	29.6	30.2	0.6
Backfat thickness, in.	1.36	1.30	1.20	1.38	1.28	0.10
Loin eye area, sq. in.	4.21	4.30	4.14	4.01	4.45	0.44
% lean cuts (carcass wt.)	53.3	54.7	53.8	51.7	55.8	4.1
% lean cuts (live wt.)	38.3	37.5	37.0	36.4	39.4	3.0
Quality Scores						
Marbling	4.6	3.1	3.4	4.4	3.6	0.8
Color	4.0	3.8	3.2	3.8	3.8	0.0
Firmness	4.8	3.8	3.2	4.8	3.8	1.0

The results of this preliminary trial reported in Table 4 indicate that sex may be an important factor in pork quality since the loins from barrow carcasses were scored higher than those from gilt carcasses for both marbling and firmness. Significant ($P < .01$) sire and line of breeding differences were also obtained indicating that heredity may also be a factor involved in loin quality.

In this preliminary trial, a significant ($P < .05$) sire-sex interaction was noted for marbling score in the OK 14 line. The 2 sire groups with the least amount of marbling among gilt carcasses had the most marbling among the barrow carcasses. The importance of these interactions are not clearly known, but these preliminary observations indicate the need for additional research in this area. Pork quality studies including other lines of breeding and more detailed measurements will be included in the next trial.

Summary

One-hundred fourteen barrow-gilt littermate pairs were evaluated for differences in performance and carcass merit. Barrows gained 0.19 lb. per day faster and reached 200 lb. 12 days earlier, but gilt carcasses were 0.6 in. longer and had 0.10 in. less backfat, 0.44 sq. in. larger loin eye area, and 4.1 percent higher yield of lean cuts. Feed efficiency records were essentially the same for both sexes in this trial.

Line of breeding and sire differences and interactions between sire and sex were also investigated. Sire-sex interactions were noted for average daily gain, loin eye area and marbling score, but these interactions were not noticed in all lines. Further studies are needed to determine the importance of these interactions.

A preliminary study of the influence of breeding and sex on pork quality was included. Significant ($P < .01$) differences were noted between lines of breeding, sire groups and sex for both marbling and firmness. Loins from barrows were firmer and had more marbling than loins from gilts.