have a greater early embryonic survival rate than 2-breed cross embryos. Although crossbred dams tended to farrow somewhat larger litters than purebred dams, the largest increase in performance from using a crossbred dam came from increased survival rate from birth to weaning. The 3-breed cross litters were approximately 11 percent larger and heavier than the 2-breed cross litters in this study. No marked differences in pig weights at birth and weaning between 2-breed and 3-breed cross litters were observed.

Influence of the Litter in which a Gilt is Raised and Her Own Performance on Her Subsequent Reproductive Performance

L. D. Young and I. T. Omtvedt

Story in Brief

This study was initiated to determine what possible influence the size and weight of the litter in which the gilt is raised and her own size, growth rate and fatness will have on the size of her first litter. The records from a total of 176 first-litter gilts from the Fort Reno Experiment station were studied.

Although most traits studied were not closely associated with the size of the gilt's first litter, some interesting trends were noted. Gilts with heavier birth weights farrowed larger litters and an increase of 1 lb. in birth weight resulted in an increase in litter size of 0.75 pigs. In Duroc and Beltsville No. 1 gilts, there was a tendency for gilts from larger litters to farrow fewer pigs, but this trend was not noticed among the crossbred gilts. Overall, the number of pigs raised in the litter from which the gilt came was not closely associated with the number of pigs she farrowed.

Duroc and Beltsville No. 1 gilts with faster gains, thus reaching 200 lbs. at an earlier age, tended to farrow larger litters. The gilt's degree of fatness was not consistently associated with the size of her first litter.

Most of the traits evaluated did not have any marked influence on the size of a gilt's first litter, but these data do indicate that swine producers can not justify placing much selection emphasis on the number of pigs farrowed in the litter from which gilts are selected.

Introduction

Litter size is of tremendous economic importance in swine, and it is also very important in swine improvement programs because the size of the litter is what limits the amount of selection possible. Litter size is lowly heritable and, therefore, is greatly affected by environment. One of these environmental factors may be the size of the litter the gilt was born and raised in. Some research has indicated that gilts selected from larger than average litters tend to have smaller than average first litters.

This study was initiated to determine how her birth weight, her weaning weight, her postweaning growth rate, her fatness, and the number and weight of the pigs in the litter from which she was selected will influence on the size of a gilt's first litter.

Materials and Methods

This study involved the records of 176 first litter gilts that were born in the spring and fall of 1967 and 1968 at the Fort Reno Experiment Station. The gilts consisted of 60 crossbreds, 55 Beltsville No. 1, and 61 Durocs that farrowed their first litters at one year of age.

The gilts were weaned at approximately 6 weeks of age and moved to a confinement feeding facility at about 8 weeks of age. They were self-fed until they reached 200 lbs. at which time they were weighed off test and probe backfat measurements were taken on each gilt. The Beltsville gilts were bred to Duroc boars, the Duroc gilts were bred to Beltsville boars, and the crossbred gilts were bred to unrelated crossbred boars so that all three groups of gilts produced crossbred litters.

Results and Discussion

The means for the traits evaluated in this study for the three breeds are shown in Table 1.

The correlations of the various traits with the number of pigs in the gilt's first litter are given in Table 2. None of the traits evaluated were closely related to the size of her first litter. There was a tendency for the size of the litter at birth that the gilt came from to be adversely

Table 1. Means for the Crossbred, Beltsville No. 1, and Duroc Gilts Used in the Study

	Crossbreds	Beltsville No. 1	Duroc	Overall	
				Means	Standard Deviation
Number of Gilts	60	55	61		
Litter in which Gilt was Raised:					
No. of pigs farrowed	10.2	10.9	11.6	10.9	2.3
Litter birth wt., lbs.	28.8	32.9	35.9	32.5	7.7
No. of pigs weaned	8.6	8.3	9.2	8.7	2.3
Litter weaning wt., lbs.	239.1	262.7	251.5	250.7	65.4
Gilt's Own Performance:					
Birth wt., lbs.	2.9	3.2	3.2	3.1	0.6
42-day wt., lbs.	29.5	32.6	27.9	29.9	5.4
Days at 200 lbs.	157.8	157.4	159.3	158.2	12.0
Probe at 200 lbs., in.	1.5	1.3	1.4	1.4	0.2
Gilt's First Litter:					
No. of pigs farrowed	9.8	8.9	10.4	9.7	2.9
No. of pigs weaned	7.9	6.2	7.5	7.2	2.7

Table 2. Correlations Between the Number of Pigs Farrowed in a Gilt's First Litter and Various Production Traits by Breed and Pooled Within Breed

	Crossbred	Beltsville No. 1	Duroc	Pooled Within Breed
Litter In Which Gilt Was Raised:				
No. of pigs farrowed	.04	—.17	—.21	—.13
Litter birth weight	.05	.04	—.16	—.03
Litter birth weight	.05	.05	—.08	.01
Litter weaning weight	—.05	.15	—.04	.03
Gilt's Own Performance:				
Birth weight	.01	.30[1]	.14	.16[1]
42-day weight	—.14	.30[1]	.05	.10
Age at 200 lbs.	.08	—.20	—.20	—.13
Probe at 200 lbs.	—.17	—.09	.10	—.04

[1] Significantly different from zero at .05 level.

related to the size of her first litter ($r = \_ .13$). Gilts from larger litters tended to farrow smaller litters than gilts selected from smaller litters. An increase of one pig in the size of the litter she came from resulted in a decrease of 0.16 pigs in her first litter. However, the size of the litter at 42 days that she came from was not associated with the size of her first litter ($r = 0.01$). This may be due to the larger losses that normally occur in the larger litters prior to weaning.

Gilts that were heavier at birth and at weaning tended to have larger litters than gilts that were lighter at birth and weaning. The correlation between the gilt's own birth weight and size of her first litter was 0.16. The correlation between her 42-day weight and the size of her first litter was not significant but followed the same trend as noted for birth weight ($r = 0.10$). In this study, each increase of 1 lb. in the gilt's birth weight was accompanied by an increase of 0.75 pigs in her first litter while each 10 lbs. increase in her 42-day weight resulted in an increase of 0.53 pigs in her first litter.

There was a tendency for gilts that reached 200 lbs. at an earlier age to farrow larger litters, but age at 200 lbs. actually accounted for less than 2 percent of the variation in litter size. A decrease of 10 days in age at 200 lbs. resulted in an increase in litter size of 0.30 pigs. In the crossbred gilts, backfat thickness was negatively correlated with size of first litter, but this trend was not noticed in the other two breed groups. Overall, backfat thickness was not associated with litter size in this study.

These results indicate that the size of the litter the gilt was selected from, her growth rate, or her backfat thickness will not greatly influence the size of her first litter. Since it is well established that litter size is lowly heritable and that most of the variation in litter size is due to environmental factors, the results obtained in this study clearly emphasize the point that swine producers cannot justify placing much selection pressure on litter size when selecting gilts for the breeding herd.
