

# Litter Performance for Various Types of Crossbred Females in Swine

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## Story in Brief

Crossbred females were mated to purebred boars to obtain 493 litters representing all possible three-breed and four-breed cross litters involving Duroc, Yorkshire, Spotted and Landrace breeds. Litters were evaluated for size, weight and survival rate. There were significant differences between crossbred female groups for litter size at 42 days and litter weight at birth, 21 and 42 days. Yorkshire-Landrace females generally had the largest and heaviest litters and other females that were one-half Landrace also had large, heavy litters, particularly at 21 and 42 days. There were no significant differences between litters sired by purebred vs crossbred boars.

## Introduction

Sow productivity is a major contributor to production efficiency in a commercial swine enterprise. It is well established that crossbred females are preferred for increased litter size and mothering ability. Evidence concerning the choice of breeds and the effect of the breeding of the boar is less clear. This is particularly true for breeds such as Spotted and Landrace.

The purpose of this study was to evaluate sow productivity for crossbred females of Duroc, Yorkshire, Landrace and Spotted breeding. Matings were made so that the effect of using crossbred vs purebred boars could also be measured.

## Materials and Methods

Crossbred females were mated to purebred and crossbred boars to produce all possible three-breed (sired by purebred boars) and four-breed (sired by crossbred boars) cross litters involving Duroc, Yorkshire, Spotted and Landrace breeding. There were 493 litters born during five consecutive farrowing seasons (fall and spring) beginning in the fall of 1977. All litters born during the first season were out of first parity gilts but both gilts and sows were used each of the subsequent seasons.

Litters were born in a farrowing house with individual farrowing crates with wood slatted floors and were moved into concrete floor nursery pens three to seven days post-farrowing. Creep was provided at about 14 days, male pigs were castrated at 21 days and sows were removed from the litters at 42 days.

Litter size and weight were measured at birth, 21 and 42 days. All fully formed pigs were counted and weighed at birth and all live pigs were included

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at 21 and 42 days. Survival rate at 21 and 42 days was the number of live pigs divided by the number of fully formed pigs at birth.

The effects of the breeding of the dam and the sire were analyzed so that season, parity, the dam's weight when she conceived and the interaction of breeding of dam and parity were accounted for.

## Results and Discussion

The litter size, weight and survival rate means for the female breeding groups are shown in Table 1. Yorkshire-Landrace females had the largest litters at birth, 21 and 42 days, the heaviest litters at 21 and 42 days their litters had the highest survival rate to 42 days. Duroc-Landrace females had the heaviest litters at birth. The smallest litters at 42 days were out of Yorkshire-Spotted dams who also had the lightest litters at birth, 21 and 42 days. It is interesting that those females which were one-half Landrace had the heaviest litters at 21 and 42 days and had litters with the highest survival rates. This, as well as the general superiority of the Yorkshire-Landrace female, generally agrees with previous work at the Oklahoma Agricultural Experiment Station and elsewhere.

Litter performance was relatively unaffected by the breeding of the sire (Table 2). Crossbred sired litters were slightly larger at birth, but had slightly lower survival rates. None of the differences were significant.

These results demonstrate the importance of making correct decisions concerning breeds when breeding stock is selected. Yorkshire-Landrace females appear to be the best, but other groups also have large, heavy litters. This provides some flexibility since the commercial swine producer is dependent upon what is available in his area. These results do not decrease the importance of choosing high quality breeding stock. The comparisons are close enough that there is unquestionably considerable overlap which means that highly productive females could be found representing any of several breeds.

The choice of the breeding of the sire does not appear to have much impact on litter performance. The breeding of sire does affect subsequent performance and conception rate so fast growing boars that have the potential to be aggressive breeders should be used. It is also important that the boar represent a breed (or breeds) that is different from the breeding of the females so that maximum heterosis is utilized.

**Table 1. Litter Size, Weight and Survival Rate for Different Types of Crossbred Dams**

Breeding of Dam	Number of litters	Litter size			Litter weight (lb)			Survival rate %	
		birth	21 days	42 days	birth	21 days	42 days	21 days	42 days
Duroc-Yorkshire	76	10.13	7.90	7.74 <sup>b</sup>	31.41 <sup>bc</sup>	90.95 <sup>bc</sup>	197.34 <sup>b</sup>	79.59	78.17
Duroc-Landrace	93	10.18	8.13	7.92 <sup>bc</sup>	32.21 <sup>c</sup>	92.05 <sup>bc</sup>	199.30 <sup>b</sup>	81.56	79.71
Duroc-Spotted	84	10.04	7.60	7.53 <sup>ab</sup>	31.15 <sup>bc</sup>	88.18 <sup>ab</sup>	195.65 <sup>b</sup>	77.52	76.89
Yorkshire-Landrace	79	10.34	8.39	8.30 <sup>c</sup>	30.56 <sup>b</sup>	95.24 <sup>c</sup>	204.40 <sup>b</sup>	81.58	80.84
Yorkshire-Spotted	80	9.86	7.37	7.13 <sup>a</sup>	28.20 <sup>a</sup>	84.63 <sup>c</sup>	181.17 <sup>b</sup>	76.77	74.54
Landrace-Spotted	81	9.80	7.91	7.72 <sup>b</sup>	30.60 <sup>b</sup>	94.05 <sup>c</sup>	199.94 <sup>b</sup>	81.84	79.87

a,b,c,d means in a column with different superscripts are significantly different ( $P < .05$ )

**Table 2. Litter Size, Weight and Survival Rate for Litters Sired by Crossbred and Purebred Boars**

Type of sire	Number of litters	Litter size			Litter weight (lb)			Survival rate %	
		birth	21 days	42 days	birth	21 days	42 days	21 days	42 days
Crossbred	194	10.17	7.76	7.63	30.69	89.11	191.39	77.99	76.76
Purebred	299	10.00	7.94	7.77	30.69	91.35	198.75	80.79	79.13