

# The Effect of Crossbred vs Purebred Boars on Conception Rate in Swine

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## Story in Brief

Conception rate and the number of services per conception were evaluated for 764 crossbred females mated to 161 purebred and crossbred boars (Duroc, Yorkshire, Spotted, Landrace and two-breed crosses). Matings took place during five consecutive (fall and spring) eight-week breeding seasons beginning in fall of 1977. No significant differences between female breeding groups were observed. Crossbred boars had significantly higher first service conception rate and fewer services per conception. The crossbred boar advantage was 17.9 percent for first service conception rate, 5.3 percent for conception rate during the breeding season and 9.0 percent for number of services per conception.

## Introduction

Boars with a greater ability to get sows pregnant will improve efficiency in a commercial swine herd in a variety of ways. Fewer females awaiting breeding are required since a larger proportion of them will become pregnant. Sows will be out of production for a shorter time following weaning and farrowing facilities can be kept full more dependably if conception rate is high. An additional expense that could be reduced is that of returning boars to the seedstock producer that are outright failures as breeders.

Previous research at the Oklahoma Agricultural Research Station and elsewhere has shown that young crossbred boars reach puberty earlier, show more testicular development and sperm numbers and are more active breeders than their purebred contemporaries.

This study was conducted to evaluate the conception rates of crossbred females when mated to purebred and crossbred boars (Duroc, Yorkshire, Spotted and Landrace).

## Materials and Methods

Data on conception rate were obtained from 764 crossbred females that were hand-mated to 161 purebred and crossbred boars (Duroc, Yorkshire, Spotted, Landrace and two-breed crosses). These matings took place during five consecutive eight-week breeding seasons (fall and spring) beginning in the spring of 1977 at the Southwest Livestock and Forage Research Station, El Reno, Ok. Only gilts were used in the first season, but a random sample of sows were retained for each of the following seasons. Boars were approximately eight months old when breeding began.

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A sample of gilts was slaughtered 30 days post-breeding each season. The remaining females that did not recycle were allowed to carry their litters to term. A mating resulted in a conception only if there were embryos at 30 days or evidence of pigs in the females allowed to carry their litters.

Conception rate was evaluated for first service and for the eight-week breeding season and the number of services per conception was measured. The breeding of the female and of the boar were analyzed with adjustment for season, parity, female's weight at first mating and several interactions.

## Results and Discussion

Breeding of boar and breeding of female least squares means for conception rate and services per conception are presented in Table 1 along with the number of attempted matings for each breed group combination. There were no significant differences among the female breeding groups for any of the three traits. The ranges for the female breeding groups were 70.4 percent (Duroc-Spotted) to 81.2 percent (Landrace-Spotted) for first service conception rate, 90.0 percent (Duroc-Yorkshire) to 97.0 percent (Yorkshire-Spotted) for breeding season conception rate and 1.14 (Landrace-Spotted) to 1.23 (Duroc-Yorkshire) services per conception.

The breeding of the boar within female breeding group was a significant source of variation for first service conception rate and number of services per conception. For first service conception rate, crossbred boars were superior to each of the corresponding purebred boars in every direct comparison. The average paternal heterosis for first service conception rate was 17.9 percent. The crossbred boar advantage was less for the entire breeding season (5.33 percent), but crossbred boars were still better than the average of the corresponding purebreds in each comparison. The number of services per conception provides an additional measure of a boar's breeding efficiency. It differs from conception rate in that it removes those females that are unable to conceive during the breeding season. The results for number of services per conception were similar to those for first-service conception rate.

Producers that use young crossbred boars should expect a higher conception rate than those using young purebred boars. This will result in a decrease in the number of females needed in the breeding herd to keep farrowing facilities full. The larger advantage at first service than for the entire breeding season suggests that the differences may be due to more advanced sexual maturity. If this is so, similar advantages may not result if older boars are used.

A problem associated with using crossbred boars is a lack of availability. This could be alleviated easily if those seedstock producers with more than one breed would produce some crossbred litters and leave some males intact. This would be fairly simple since many are already selling crossbred gilts.

**Table 1. Least-squares means for reproductive performance of purebred and crossbred boars mated to crossbred females.**

Breeding of Female	Breeding of Boar	Number of females	Conception Rate (%)		No. of Services per Conception
			First Service	Breeding Season <sup>a</sup>	
Duroc-Yorkshire	Landrace	32	64.1	83.4	1.27
	Landrace-Spotted	46	86.1 <sup>b</sup>	93.7	1.09 <sup>b</sup>
	Spotted	37	67.5	93.0	1.33
	Average	115	72.5	90.0	1.23
Duroc Landrace	Yorkshire	41	72.4	97.0	1.25
	Yorkshire-Spotted	58	81.5	96.3	1.16
	Spotted	41	78.9	92.2	1.16
	Average	140	77.6	95.2	1.19
Duroc-Spotted	Yorkshire	40	74.8	95.1	1.28
	Yorkshire-Landrace	56	76.1	93.6	1.20
	Landrace	42	60.4	90.0	1.36
	Average	138	70.4	92.8	1.28
Yorkshire-Landrace	Duroc	35	71.2	87.3	1.20
	Duroc-Spotted	50	85.9	99.4 <sup>b</sup>	1.16
	Spotted	34	83.2	89.2	1.09
	Average	119	80.1	91.9	1.15
Yorkshire-Spotted	Duroc	38	66.9	96.5	1.30
	Duroc-Landrace	49	89.7 <sup>b</sup>	98.9	1.09
	Landrace	37	78.4	95.5	1.23
	Average	124	78.3	97.0	1.21
Landrace-Spotted	Duroc	41	84.2	91.8	1.09
	Duroc-Yorkshire	50	92.2 <sup>b</sup>	96.0	1.05
	Yorkshire	37	67.3	87.5	1.28
	Average	128	81.2	91.8	1.14

<sup>a</sup>breeding season was eight weeks

<sup>b</sup>crossbred boar means that were significantly ( $P < .05$ ) better than corresponding purebreds

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