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# Age and Synchrony of First Estrus in Gilts as Influenced by Type and Duration of Daily Boar Exposure (BE)

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## Summary and Implications

*Fence-line boar exposure (FBE) and physical boar exposure (PBE), each with durations of 10 minutes or four hours, were evaluated for their ability to trigger puberty in gilts. Gilts provided PBE attained puberty 11.8 days earlier than gilts provided FBE. Duration of boar contact was without effect. Earlier age at first estrus resulted, in large part, from a more rapid pubertal response after initiation of boar exposure (BE). The mean interval from initiation of BE to pubertal estrus was 13.5 days for PBE gilts and 24.8 days for FBE gilts. Fence-line boar exposure stimulates earlier puberty in gilts (shown in previous studies), but is less effective than PBE for triggering a rapid pubertal response in gilts. Physical boar exposure is required to achieve the maximal pubertal response to boar exposure when applied daily for limited periods (4 hours or less) to gilts nearing onset of puberty.*

## Introduction

Recent evidence from Australia suggests that physical contact with boars is needed to achieve the maximal pubertal response in gilts. Fence-line contact with boars or providing gilts contact with a caged boar were less effective than full-contact with boars. Further, gilts that were masked and prevented from having nose-to-nose contact with boars were less responsive to full-boar contact than unmasked control gilts. Duration of contact may also be important.

Research conducted at Nebraska (1994 Nebraska Swine Report) determined that once daily (10 min/day) physical contact with boars was less effective than either continuous fence-line or continuous physical contact with boars. However, earlier research at Nebraska (1988 and 1991 Nebraska Swine Reports) demonstrated that duration of boar exposure (BE) was without effect when duration was relatively short. No difference was observed between 5, 15 and 30 minutes of once daily BE. The objectives of the present experiment were to determine the effects on the pubertal response in gilts of: (1) type of BE, physical vs fence-line contact with boars; (2) duration of BE, 10 minutes vs four hours of daily

contact with boars, and (3) the possible interaction of type of BE and duration of BE.

## Materials and Methods

Fifty-six gilts from the Gene Pool herd were assigned randomly within litter to a replicated experiment involving two types of boar exposure (physical contact, PBE vs fence-line contact, FBE) and two durations of daily BE (10 min vs 4 hours). Blood samples were obtained for later analysis of progesterone one week before and one day before initiation of treatment on December 16, 1994 (age = 172 to 177 days, Rep 1 and 164 to 175 days, Rep 2) to establish ovarian status. Gilts were maintained in groups of seven or eight in a separate room from where they received BE. Each group of gilts was taken to the boar room for the assigned period of BE each day.

Two sets of four crossbred boars (7 to 8 months of age at start) were used. They were maintained in separate pens between periods of BE and rotated between treatment groups each day to insure that PBE and FBE gilts received similar boar stimuli during the treatment period. Physical BE was provided by moving two boars into each of

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**Table 1. Mean ( $\pm$  SE) age at puberty as affected by type and duration of boar exposure (BE)**

Type of BE <sup>a</sup>	Duration of BE		
	10 min	4 h	Combined
FBE	199.4 $\pm$ 5.5	198.3 $\pm$ 4.5	198.8 <sup>b</sup>
PBE	186.9 $\pm$ 4.5	187.0 $\pm$ 4.8	187.0
Combined	193.2	192.6	

<sup>a</sup>FBE, fence-line contact with boars; PBE, physical contact with boars.

<sup>b</sup>P<.02

**Table 2. Mean ( $\pm$  SE) interval to puberty after initiation of boar exposure (BE)**

Type of BE <sup>a</sup>	Duration of BE		
	10 min	4 h	Combined
FBE	25.7 $\pm$ 5.2	24.0 $\pm$ 4.3	24.8 <sup>b</sup>
PBE	13.6 $\pm$ 4.3	13.4 $\pm$ 4.5	13.5
Combined	19.6	18.7	

<sup>a</sup>FBE, fence-line contact with boars; PBE, physical contact with boars.

<sup>b</sup>P<.05

two gilt pens maintained for the PBE treatment. Fence-line BE was provided by moving FBE gilts into pens on each side of a pen occupied by four boars. Each group of gilts was returned to their home room after the assigned treatment period (10 min or 4 hours).

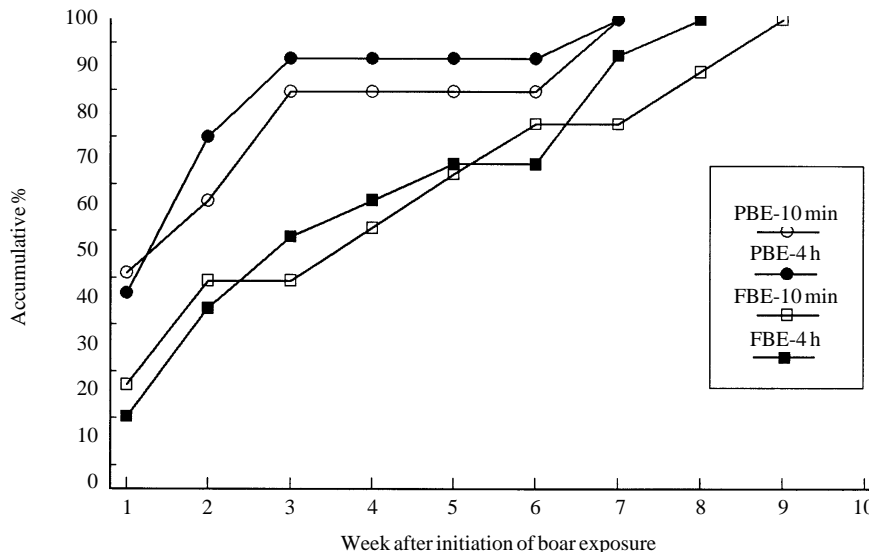
Gilts were observed and symptoms of estrus recorded for all groups during the first 10 minutes of BE each day. Any gilts on the PBE treatment that were observed in estrus were removed immediately from the pen and returned to their home room to prevent mating

and encourage boars to continue stimulating other gilts in the pen. Gilts exposed to boars for four hours were observed again for estrus just before (5 min) they were returned to their home room.

## Results and Discussion

Seven gilts had ovulated before treatment initiation and were deleted. Two other gilts were deleted because of lameness or their reproductive tract was missing. All other gilts (N=47) expressed first estrus by termination of the experiment on February 13. Type of BE but not duration of BE produced a significant difference in average age at puberty. No interaction was observed between type and duration of BE. Gilts that received PBE reached puberty 11.8 d earlier than gilts that received FBE (187.0 vs 198.8, P<.02, Table 1). The interval to first estrus after initiation of BE was substantially shorter (13.5 vs 24.8 d, P<.05, Table 2) in PBE gilts. This resulted in part because PBE gilts showed a more synchronous first estrus. Forty-four percent of PBE gilts vs 18 percent of FBE gilts expressed first estrus at the end of the first week of BE (Figure 1). The advantage widened at the end of the third week of BE (88% PBE vs 50% of FBE gilts had reached puberty) and then declined gradually thereafter. All PBE gilts had expressed first estrus by the end of wk 7 of BE. FBE gilts did not achieve a 100 percent pubertal response until the end of the 9th week.

Physical BE is a more effective stimulus than FBE for triggering an earlier and more synchronous first estrus in gilts nearing puberty when first stimulated. Future experiments will attempt to determine the reasons for this difference and whether this difference is expressed when boar exposure is applied at earlier stages of pubertal development.



**Figure 1. Accumulative percentage of gilts expressing pubertal estrus after initiation of boar exposure. FBE = fence-line contact with boars and PBE = physical contact with boars.**

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