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A series of experiments in Australia have clearly shown that the percentage of estrous gilts displaying the standing-response to the back-pressure test is reduced when gilts are housed adjacent to boars (Figure 1).

The decrease in efficiency of estrous detection is thought to occur because gilts become accustomed (habituated) to auditory and olfactory stimuli of the boar and are then less responsive to boar stimuli at the time of estrous detection. This result may occur because gilts are habituated or are refractory (females are in estrous but will not stand) to boar stimuli at the time of estrous detection.

The following experiment was conducted to test the hypothesis that estrous gilts become refractory to boar stimuli after initially exhibiting standing estrus.

Materials and Methods

Seventeen ovariectomized gilts were induced into estrus by intramuscularly injecting .8 mg estradiol benzoate (EB) on two consecutive days. Starting four days after the first EB injection, gilts were individually taken to a breeding facility and observed for standing estrus by applying pressure to the gilts back while boars were present. Before pressure was applied on the gilt's back, each gilt was carefully positioned so she had excellent head-to-head contact with a boar. If a gilt stood for a full 10 seconds, she was recorded as being in standing estrus. Gilts did not have boar contact before entering the breeding facility.

The breeding facility had two breeding pens. Six boars (three boars per side) were penned facing and adjacent to each breeding pen. All 12 boars were known to be sexually aggressive before the experiment began.

Each gilt was observed for standing estrus in the first breeding pen at 0 (time of entry), 5, and 10 minutes after entry into the breeding facility. It was considered possible that the boars' courtship (chanting and chomping) may decline when continuously presented with the same gilt over a 21-minute period; therefore, each gilt was carefully moved (about 3 feet) through a gate into the adjacent breeding pen and observed for standing estrus at 11, 16, and 21 minutes after initial entry into the first breeding pen.

Gilts were heat-checked at 93 (Day 1-AM), 99 (Day 1-PM), 117 (Day 2-AM), and 123 hours (Day 2-PM) after the last EB injection. Gilts were housed in a separate building (3 to 4 gilts per pen) when not being heat-checked.

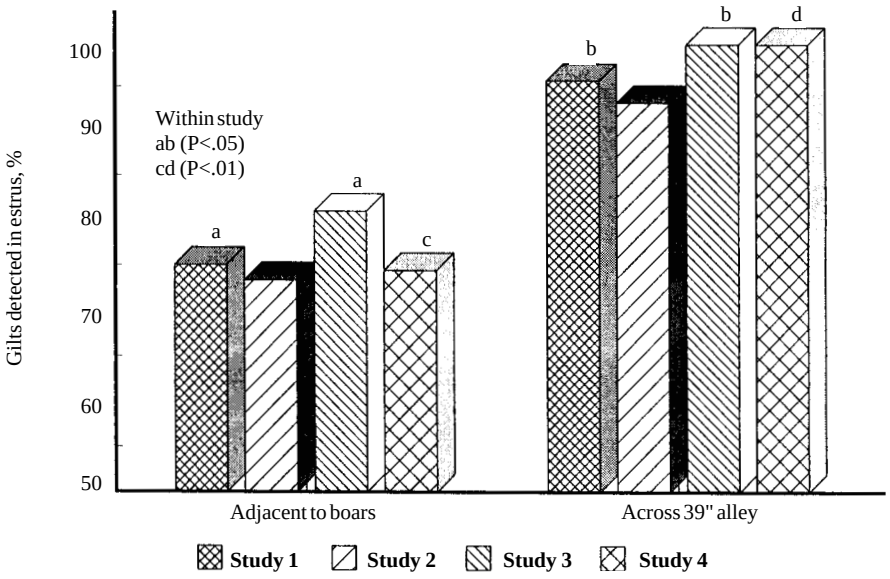

Figure 1. The effect of housing location on the efficiency of detecting estrus in gilts

Results

On Day 1, four gilts did not exhibit the standing response at the first observation during the AM evaluation, and two gilts did not exhibit the standing response at the first observation during the PM evaluation. Since the duration of standing estrus can not be measured in nonestrus females, the statistical analysis of data for Day 1-AM and Day 1-PM did not include nonestrus females.

The number of gilts that exhibited standing estrus at 0 minutes was 13, 15, 17 and 17 for Day 1-AM, Day 1-PM, Day 2-AM, and Day 2-PM, respectively.

The Chi-square analysis showed a significant effect for day of evaluation ($\chi^2 = 4.87$, $P < .03$) and time of evaluation ($\chi^2 = 19.29$, $P < .002$). The proportion of gilts standing across time was higher on Day 1 than Day 2 (Figure 2). The proportion of gilts found in standing estrus on Day 1-AM started to

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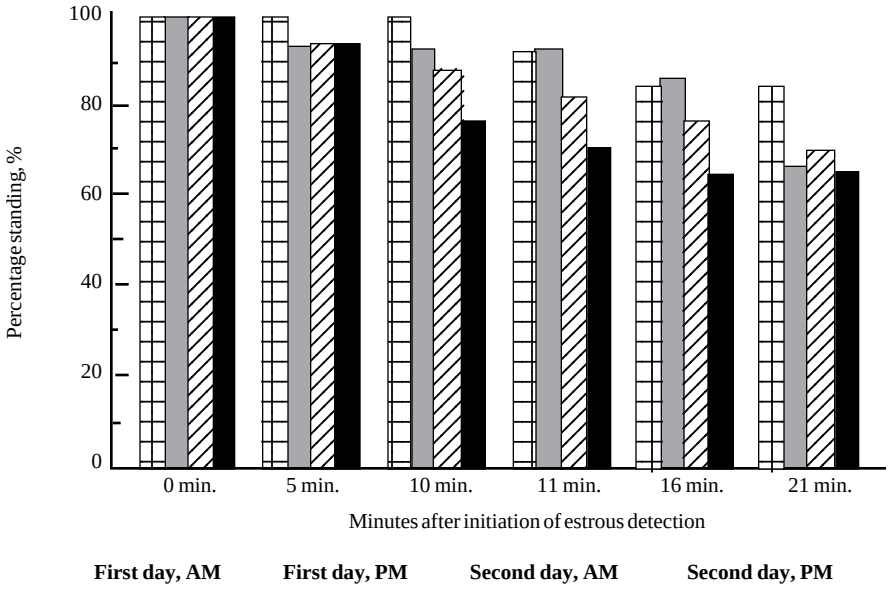

Figure 2. Proportion of gilts in standing estrus.

decrease at the 11-minute observation time, 84.6 % of the gilts were found in standing estrus at the 21-minute observation time.

The proportion of gilts exhibiting the standing response on Day 1-PM was 93.3 % at observation times of 5, 10, and 11 minutes and 66.7 % at the 21-minute observation time. The proportion of gilts found in standing estrus on Day 2-AM decreased linearly to 70.6 % at the 21-minute observation time. The proportion of gilts in standing estrus on Day 2-PM decreased to 64.7 % at the 16- and 21-minute observation times.

Conclusions and Implications

The results of this study are interpreted to mean that estrous gilts become refractory to boar stimuli. Therefore, when estrous gilts show an initial standing response to boars, they should be mated within approximately 10 minutes or some of the females may become refractory to boar stimuli. It is not known whether the duration of time before estrous females become refractory after receiving boar stimuli is different for recently weaned sows, females having continuous boar contact, or when females receive physical contact from a boar during mating.

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