

Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 10 *Swine Day (1968-2014)*

Article 365

1987

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Recommended Citation

Newton, E A.; Stevenson, Jeffrey S.; and Davis, Duane L. (1987) "Estrous expression of sows after altered suckling and boar exposure," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 10. <https://doi.org/10.4148/2378-5977.6205>

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ESTROUS EXPRESSION OF SOWS AFTER ALTERED SUCKLING AND BOAR EXPOSURE

E.A. Newton, J.S. Stevenson, and D.L. Davis

Summary

In two different experiments, we studied the influence of: 1) separating litters from their dams (altered suckling) during the last 8 days of lactation, which included a change in housing and social interaction with other sows; 2) providing boar exposure (1 hr/d); and 3) parity on the ability of sows to come into heat during lactation and after weaning. Our studies indicated that: 1) 6 hr of altered suckling and 1 hr of boar exposure may shorten the interval to heat for sows that express estrus during lactation, but 3 hr of altered suckling and 1 h of boar exposure are sufficient to induce estrus in 65 to 79% of the sows; 2) boar exposure (1 hr/day) of sows is not sufficient to induce estrus during lactation; 3) preweaning boar exposure (1 hr/day) reduced intervals to heat after weaning; and 4) breed composition and season may alter the responsiveness of sows to treatments that induce estrus during lactation and after weaning.

Introduction

In continuation of our earlier research (Swine Day 1984, KAES Report of Progress 461), we are studying various stimuli that are included in the treatments of altered suckling and boar exposure during lactation. Altered suckling includes reducing the suckling stimulus, providing sows a new environment (group pen vs individual farrowing crate), and changing social status (group vs individual). Boar exposure provides various stimuli associated with the presence of the boar (e.g., sight, smell, touch, and taste). Other studies have shown that various combinations of these stimuli are effective stimulators of estrous expression during lactation and after weaning. Our objectives were to examine further the effects of duration of litter separation, boar exposure, and parity on estrous expression of sows during lactation and after weaning.

Procedures

Exp. 1. Two trials were conducted utilizing 39 crossbred (Yorkshire x Duroc) sows of mixed parity. Sows were either removed from their litters (litter separation or LS) for 3 (n=20) or 6 (n=19) hr/day and exposed to boars for 1 hr/day beginning 8 days before weaning piglets from sows at 3 to 4 wk of age. When sows were treated as described, they were removed from their litters, moved to outside pens, grouped with at least four similar sows, and exposed to a mature boar in the same pen for at least 1 hr during the 3 or 6-hr separation period.

Exp. 2. Four trials were conducted utilizing 101 crossbred (50% Yorkshire x Duroc x 50% Chester White) sows of mixed parity. Sows were assigned to four

treatments: 1) boar exposure (BE) for 1 hr/day, 2) separating sows from their litters or litter separation (LS) for 6 hr/day, 3) LS + BE, and 4) controls (no LS + no BE). Treatments began 8 days before weaning and sows were handled as described above for Exp. 1. Sows that were only boar-exposed (BE) were housed in elevated crates in a separate, but similar farrowing building and only received nose to nose contact with a mature boar for 1 hr/day.

Results and Discussion

Results of Exp. 1 are shown in table 1. Although 6 hr LS + 1 hr BE appeared to be more effective, nearly equal proportions of sows were observed in heat during lactation in response to treatment. Sows treated for 6 hr and detected in estrus during lactation had slightly shorter ($P=.08$) intervals from treatment to estrus by .6 days. Similar intervals to estrus were detected for sows in both groups that came into heat after weaning. As expected from our earlier work, more ($P<.01$) older sows were in estrus during lactation in response to treatment and their intervals from treatment to estrus were shorter ($P<.01$) than those of primiparous sows. For sows showing heat after weaning, older sows expressed estrus earlier ($P=.07$) than younger sows.

Table 1. Interval to Estrus for Sows (Exp. 1) after 3 or 6 Hours of Litter Separation (LS) and Boar Exposure (BE)

Item	No. Sows	Percentage in Heat During Lactation	Days to Estrus ^a	
			Lactation	Postweaning
Treatment				
3 hr LS + 1 hr BE	20	65	5.1 + .3	5.1 + .8
6 hr LS + 1 hr BE	19	79	4.5 + .2 ^c	5.7 + .8
Parity				
Primiparous	13	38 ^b	5.6 + .7	6.0 + .6
Multiparous	26	88	4.6 + .2 ^d	3.7 + .3 ^e

^aSows either expressed estrus during lactation in response to treatment or showed heat normally after weaning.

^bFewer ($P<.01$) primiparous than multiparous sows were in estrus during lactation in response to treatment.

^cShorter ($P=.08$) interval to heat for 6 than for 3-hr sows.

^dShorter ($P<.01$) interval to heat for multiparous than primiparous sows.

^eSame as footnote "d", but $P = .07$.

Results of Exp. 2 are summarized in table 2. We found that only sows that received LS (9/47 or 16%) with (5/28) or without (4/28) concurrent BE were capable of estrous expression during lactation. Of those sows showing estrus during lactation, intervals from treatment to estrus were similar. For sows not responding to treatments, postweaning intervals to heat were shorter ($P < .05$) for sows that received preweaning or lactational BE than for those in either LS + BE or control groups. There were no parity differences either in the proportion of sows in heat during lactation or in the intervals to heat before or after weaning. This group of sows was 50% Chester White and, thus, represented a different genetic background than sows in our earlier studies, including Exp. 1. In addition, some of these trials were conducted in late summer and early fall, different seasons from all of our earlier work, including Exp. 1, which was completed during late fall and early winter.

Table 2. Days to Estrus (Exp. 2) for Sows after Litter Separation (LS), Boar Exposure (BE), LS + BE, and Weaning

Item	No. Sows	Percentage in Heat During Lactation	Days to Estrus ^a	
			Lactation	Postweaning
Treatment				
BE	26	0		4.0 $\pm$.2 ^a
LS	28	14	5.2 $\pm$.2	4.5 $\pm$.2
LS + BE	28	18	5.8 $\pm$.9	4.8 $\pm$.2
Control	18	0		4.9 $\pm$.3
Parity				
Primiparous	58	14	5.5 $\pm$.5	4.7 $\pm$.2
Multiparous	42	2	6	4.3 $\pm$.2

^aShorter ($P < .05$) interval to estrus compared to control and LS + BE sows.

These studies demonstrated that duration of LS was not critical for sows to show estrus, but longer LS periods (6 vs 3 hr) may be important in reducing the interval from treatment to estrus. At this time, we are unable to partition the effect of changing the physical and social environment of the LS sows from the reduced suckling stimuli because of the confounding nature of these factors. Since BE alone did not increase the estrous response during lactation, we have concluded that LS is more important to the success of estrous expression during lactation than BE. Further work examining the potential genetic, seasonal, and LS-associated factors are warranted to help us better understand the nature of this lactational estrous response, as well as its physiological mechanisms. Such work will provide basic information necessary for understanding the normal lactation suppression of estrus and for developing new approaches for managing sow herds.