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Induction of fertile estrus during lactation in sows

Abstract

Our objective was to determine the effectiveness of inducing estrus during lactation by reducing the nursing load of the sow between 2 and 4 weeks after farrowing. Lactating sows were separated from their litters for either 6 (20 sows) or 12 (10 sows) hr/day between 2 and 4 weeks postpartum. For comparison, the litters of other sows were weaned at either 2 (13 sows) or 4 (16 sows) weeks of age. Estrus was induced in 13 of 20 (65%) sows and 5 of 10 (50%) sows that were separated from their litters for 6 or 12 hr/day during lactation, respectively, compared with 0/13 and 0/16 sows weaned at 2 or 4 weeks. The 18 sows that showed estrus during lactation averaged 5.9 days from the first day of litter separation to estrus compared with 4.4 and 4.2 days from weaning to estrus for sows weaned at 2 or 4 weeks. Fertility traits (number of corpora lutea, eggs fertilized, fertilization rate, eggs cleaved, and cleavage rate) were unaffected by treatment. Daily separation of sows from their litters for at least 6 hr/day resulted in 60% of the sows showing synchronous estrus in 4 to 8 days with fertility similar to that of sows weaned completely at 2 or 4 weeks postpartum.; Swine Day, Manhattan, KS, November 10, 1983

Keywords

Swine day, 1983; Kansas Agricultural Experiment Station contribution; no. 84-174-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 442; Swine; Fertile; Estrous; Lactation

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INDUCTION OF FERTILE ESTRUS DURING LACTATION IN SOWS

Jeffrey S. Stevenson and Duane L. Davis

Summary

Our objective was to determine the effectiveness of inducing estrus during lactation by reducing the nursing load of the sow between 2 and 4 weeks after farrowing. Lactating sows were separated from their litters for either 6 (20 sows) or 12 (10 sows) hr/day between 2 and 4 weeks postpartum. For comparison, the litters of other sows were weaned at either 2 (13 sows) or 4 (16 sows) weeks of age. Estrus was induced in 13 of 20 (65%) sows and 5 of 10 (50%) sows that were separated from their litters for 6 or 12 hr/day during lactation, respectively, compared with 0/13 and 0/16 sows weaned at 2 or 4 weeks. The 18 sows that showed estrus during lactation averaged 5.9 days from the first day of litter separation to estrus compared with 4.4 and 4.2 days from weaning to estrus for sows weaned at 2 or 4 weeks. Fertility traits (number of corpora lutea, eggs fertilized, fertilization rate, eggs cleaved, and cleavage rate) were unaffected by treatment. Daily separation of sows from their litters for at least 6 hr/day resulted in 60% of the sows showing synchronous estrus in 4 to 8 days with fertility similar to that of sows weaned completely at 2 or 4 weeks postpartum.

Introduction

Reduction of the interval between successive farrowings for sows could be accomplished by reducing lactation length. Another approach is to induce estrus during lactation. Suckling by the litter normally prevents estrus and ovulation during lactation. Therefore, we separated sows from their litters for either 6 or 12 hr/day and compared estrus and fertility in these sows with control sows.

Experimental Procedure

Two trials were conducted with 59 crossbred (Yorkshire x Duroc) sows. Sows were assigned randomly to one of four treatments: 1) separating sows from their litters for 6 hr/day; 2) separating sows from their litters for 12 hr/day; 3) weaning litters at 2 weeks of age; or 4) weaning litters at 4 weeks of age. When sows were separated from their litters, they were moved from their farrowing crates to outside pens and were exposed to an intact boar (fenceline contact) during 2 hr/day. When estrus was detected, sows were inseminated artificially approximately 24 and 36 hr later. Eggs were recovered 4 to 6 days after estrus (day 0) to determine eggs fertilized, fertilization rate, eggs cleaved (number of eggs undergoing cell division to become embryos), and cleavage rate. Ovarian structures also were observed and the corpora lutea (CL) counted. The number of CL estimates the number of eggs ovulated.

Results and Discussion

Separation of sows from their litters during the last 2 weeks of a 4-week lactation resulted in estrus in 18 of 30 (60%) sows during lactation. Estrous response was similar for sows separated for either 6 (13 of 20; 65%) or 12 (5 of 10; 50%) hr/day. The number of sows and distribution of sows in heat after separation or weaning is shown in table 1. Those sows that showed heat during lactation came into estrus between 4 and 8 days after the separation treatment began. Sows that did not respond to treatment returned to estrus after weaning, similar to sows weaned at 2 or 4 weeks. The range and average intervals to heat after separation or weaning were similar (table 1). Two of the sows weaned at 4 weeks were not detected in estrus after weaning. Both sows had CL on their ovaries and the appearance of the CL indicated that both sows had ovulated during the later stages of their lactation. One sow in the separation group, which showed heat during lactation, failed to ovulate and had follicular cysts on her ovaries.

Table 1. Number of Sows, Distribution of Sows in Heat, and Average Intervals to Estrus After Separation or Weaning.

Days after weaning or separation	Separation 2 to 4 wk		Weaned 2 wk	Weaned 4 wk
	Lactational estrus ^a	Weaning estrus ^b		
2	0	1	0	1
3	0	3	0	2
4	2	5	9	8
5	6	1	3	0
6	5	0	1	0
7	2	2	0	2
8	3	0	0	0
<u>No heat</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>2</u>
Total	18	12	13	15
Average days to estrus	5.9 ^c	4.4 ^d	4.4 ^d	4.2 ^d

^aThese sows showed estrus during lactation in response to the separation treatment.

^bThese sows did not respond to the separation treatment but came into estrus after weaning.

^cInterval from separation at 2 weeks until estrus occurred.

^dInterval from weaning to estrus.

Fertility traits of all sows in each treatment group are shown in table 2. There were no significant differences in fertility traits, although sows weaned at 2 weeks and sows with lactational estrus appeared to have slightly lower fertilization and cleavage rates, but had higher ovulation rates (more corpora lutea), than the other two groups.

Table 2. Fertility Traits of Sows After Lactational Estrus or After Weaning at 2 or 4 Weeks.

Item	Separation 2 to 4 wk		Weaned 2 wk	Weaned 4 wk
	Lactational estrus ^a	Weaning estrus ^b		
No. corpora lutea/sow	20.3	17.2	19.8	18.3
Eggs fertilized/sow	13.7	13.8	15.6	14.6
Fertilization rate, ^c %	81	90	86	91
Cleaved eggs/sow	13.7	13.7	15.0	14.5
Cleavage rate, ^d %	80	89	82	90

^aThese sows showed estrus during lactation in response to the separation treatment.

^bThese sows did not respond to the separation treatment but came into estrus after weaning.

^cNumber of eggs fertilized/number of eggs recovered x 100.

^dNumber of eggs fertilized that began cell division into embryos/number of eggs recovered x 100.

Conclusions

This study indicates that when sows are weaned at 2 or 4 weeks, intervals to postweaning estrus, as well as fertility traits, are very similar. Sows with lactational estrus came into heat as soon after separation began as did other sows after weaning. Removal of pigs for at least 6 hr/day in 60% of the sows was similar to completely weaning the litter, except for an average of 1.5 days longer to estrus. Although fertility traits were similar when examined 4 to 6 days after estrus, other research has indicated that subsequent litter size may be smaller if sows are bred too early after farrowing (< 2 weeks). However, sows in our experiment were not bred before 2 weeks after farrowing. But before these types of treatments could be used on the farm, fertility at subsequent farrowings should be examined. Inducing estrus during lactation might be feasible for farms where continuous farrowing is practiced. Having sows pregnant during the later stages of lactation would reduce intervals between farrowings and still allow longer lactation periods for the nursing pigs. These ideas need to be further tested to examine fertility, as well as other management considerations.