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REPRODUCTIVE PERFORMANCE OF SOWS AFTER REDUCING LITTER SIZE FOR FIVE DAYS BEFORE WEANING

Jeffrey S. Stevenson and Duane L. Davis

Summary

Our objective was to characterize reproductive performance for sows nursed by only two to four pigs for the last 5 days of lactation. Litter size was reduced beginning at 2 (16 sows), 3 (15 sows), or 4 (15 sows) weeks after farrowing, while 14 sows had no change in their litter size and were weaned at 5 weeks. Reducing litter size (RLS) resulted in 19 of 46 (41%) sows showing estrus at weaning. More ($P < .05$) RLS sows were in heat 0 to 3 days after weaning compared with control sows. Fertility traits (number of corpora lutea, eggs fertilized, fertilization rate, cleaved eggs, and cleavage rate) were determined 4 to 6 days after estrus and were unaffected by treatment. Intervals to estrus after weaning were reduced using the RLS treatment while maintaining normal fertility after inseminations at the early estrus. However, for those sows not in heat at weaning in response to RLS treatment, intervals to estrus were less synchronous than for controls.

Introduction

Modern swine production requires prompt rebreeding of sows after weaning to maintain synchronized farrowing groups and the advantages of an "all in - all out" farrowing and weaning system. Rebreeding of sows as groups requires a prompt and fairly synchronous return to estrus after weaning. Many reports indicate that during summer and fall seasons, sows are slower to return to estrus and younger sows (first-litter sows especially) are slower to begin estrous cycles in all seasons compared to older sows. Other research has indicated that altering or reducing the nursing load (number of nursing pigs/sow) for a few days before weaning will hasten the return to estrus for sows. This study was conducted to extend our previous observations and to examine the fertility of sows that respond to reduced litter size treatments.

Experimental Procedure

Three trials were conducted with 60 crossbred (Yorkshire x Duroc) sows of mixed parity. Sows were assigned randomly to one of four experimental groups. The number of nursing pigs was reduced to two to four pigs/sow for 5 days before final weaning. Groups of sows had their litters reduced (RLS) beginning at 2, 3, or 4 weeks postpartum (experimental groups) or had no special treatment with the whole litter weaned at 5 weeks of age (control). Sows were housed in outside lots or in gestation stalls after weaning and were checked for estrus twice daily beginning the morning of weaning. Sows were inseminated artificially or hand-mated twice to two different boars approximately 24 and 36 hr after estrus was detected. Ovarian structures, fertilization, and cleavage rate of eggs were determined 4 to 6 days after estrus (day 0).

Results and Discussion

Reducing the litter size (RLS) 5 days before final weaning of the litter resulted in 19 of 46 (41%) sows showing estrus on the morning of weaning compared to 0 of 14 control sows (table 1).

Table 1. Number of Sows and Distribution of Heats After Weaning

Days after Weaning	RLS treatment			Control
	2 wk	3 wk	4 wk	5 wk
0	8 (50) ^a	7 (47) ^a	4 (27) ^a	0 (0) ^a
1	0	0	0	0
2	1	1	0	0
3	2	2	6	6
4	2	3	4	8
5	1	0	0	0
6	0	1	0	0
7	0	0	0	0
8	1	0	0	0
<u>No heat</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>0</u>
<u>Total</u>	<u>16</u>	<u>15</u>	<u>15</u>	<u>14</u>
Average days to heat	1.9	1.9	2.4	3.6

^aPercent of assigned sows in heat at weaning.

Litter reduction at 2 (50%) and 3 (47%) weeks of lactation tended to improve the estrous response at weaning compared with that at 4 weeks (27%). All but three sows were observed in estrus by 8 days after weaning. Those three sows were examined after day 10 postweaning. Based on the appearance of the corpora lutea and a detectable increase in serum progesterone between treatment and weaning, two of the three sows were presumed to have ovulated before weaning and the third sow was anestrus.

Fertility traits examined at surgery were similar for sows that were in estrus at weaning compared with sows that failed to respond to RLS treatment (i.e., not in heat at weaning). The fact that fertility was similar means that those sows in heat at weaning were not bred too late during estrus. Because we did not begin heat checks until weaning, we do not know how soon those sows began estrus after treatment initiation. Furthermore, no differences were observed in fertility between RLS and control sows. Number of corpora lutea (an indication of the number of eggs ovulated), eggs fertilized, fertilization rate, fertilized eggs that had begun cell division into embryos (cleaved eggs), and cleavage rate were similar among treatments (table 2).

Table 2. Fecundity of Sows After Reduced Litter Size (RLS)

Item	RLS treatment			RLS total	Control 5 wk
	2 wk	3 wk	4 wk		
No. corpora lutea/sow ^a	17.2	17.6	18.5	17.8	18.4
Eggs fertilized/sow ^b	14.3	14.5	16.3	15.0	15.0
Fertilization rate ^b , %	95	94	94	95	90
Cleaved eggs/sow ^c	14.3	13.7	16.3	14.8	15.0
Cleavage rate ^c , %	95	90	94	93	90

^aDetermined 4 to 6 days postestrus.

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

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

Conclusion

Reducing litter size for 5 days before weaning shortened the average days to estrus but increased the variation in the intervals to heat for those sows that were not in heat at weaning. Regardless of the time of RLS treatment after farrowing, fertility was unaffected when compared to controls. These treatments need to be further tested before application on hog farms. We must be able to shorten the interval to estrus as well as protect the natural postweaning synchrony of estrus before an improvement can be made in this area of breeding management. This experiment increased our understanding of how sows respond to changes in suckling. We are continuing to research this area with the goal of increasing the number of sows conceiving within one week after their litters are weaned.