HOUSING SOWS AFTER WEANING: RE-ESTABLISHMENT OF ESTRUS AND SUBSEQUENT REPRODUCTION[1]

William E. Schmidt, Duane L. Davis and
Jeffrey S. Stevenson

Summary

We penned sows after weaning either in groups of 4 or 5 or individually in gestation stalls. Beginning 3 days after weaning sows were checked twice daily and artificially inseminated 24 and 36 hr after first detected estrus. Twenty four to 48 hr after their last insemination sows either were moved to the other penning treatment, or remained in their weaning treatment, for 30 additional days. Group penning after weaning resulted in a slightly shorter interval to estrus (.25 day; $P<.05$). But percent sows in estrus by 10 days after weaning was similar in both groups. No effects on farrowing rate or litter size, due to weaning treatment, were observed.

Post-breeding treatment affected farrowing rate ($P<.05$) with 80.6% of sows penned in groups farrowing, as opposed to 67.3% of individually stalled sows. No effects on either total or live pigs farrowed could be attributed to post-breeding treatment.

Introduction

Confinement housing for the breeding herd has become popular but relatively little information is available on the effects of different types of housing on reproductive performance. Therefore, we conducted an experiment to compare the reproductive performance of sows housed either in groups of 4 to 5 or in individual gestation stalls from weaning through the early stages of pregnancy.

Experimental Procedures

Sows used in this study farrowed in one of nine groups over a 2.5 year period. Sows were assigned (based on parity, body weight and back fat thickness) to be either penned in groups of 4 to 5 (6 ft x 14 ft pens) or individually housed in a gestation stall (21 in x 66 in) after a 3.0 to 4.5-week lactation. This was considered their weaning treatment. Beginning 3 days after weaning sows were checked twice daily for estrus using a boar. Individually stalled sows were moved in groups to a pen for estrous detection. Estrous checks continued until sows would stand for the mounting boar, in response to back pressure, or until 10 days after weaning. Sows were inseminated artificially with semen from 2 or more boars at 24 and 36 hours after first detected estrus. Twenty-four to 48 hours

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after their last insemination, one-half of the sows in each group were relocated to the opposite treatment. Therefore, one-half of group-penned sows were moved to an individual stall and one-half of individually housed sows were moved to a group pen. The remaining one half of sows in each treatment group remained in their weaning treatment. These penning treatments continued until 30 days after breeding and are referred to as the post-breeding treatment. From 30 days after breeding until a few days before farrowing, when they were moved to the farrowing house, all sows in each farrowing group were housed in the same environment either in individual stalls or in groups in outside lots.

This experimental design permitted comparisons of all four possible penning treatment combinations: pen-pen; pen-stall; stall-pen; and stall-stall. Treatments were imposed only during the first 30 days of pregnancy because this is the critical interval for establishing a successful pregnancy.

Blood was collected once from all sows between 19 and 23 days after their post-weaning estrus and serum progesterone was measured by radioimmunoassay. If pregnancy was established, then high progesterone levels (greater than 2 nanograms (ng)/ml)) would be expected. Progesterone levels less than 2 ng/ml indicated that early pregnancy failure (< 2 weeks after breeding) had occurred. Progesterone levels were used to estimate the amount of early pregnancy loss in each treatment group.

Results and Discussion

Treatment effects on return to estrus after weaning are presented in table 1. The incidence of anestrus was not significantly affected by the penning treatments. First-litter sows weaned in the summer had the highest incidence of anestrus (data not shown). Sows penned in groups after weaning returned to estrus slightly sooner than individually stalled sows ($P<.05$), but this difference was too small to be of practical importance. The ovaries of sows not detected in estrus were examined and 44 of 50 (88%) had only small follicles. Therefore, the primary reason for anestrus was the failure to grow and ovulate ovarian follicles. Two of the 50 anestrus sows (6%) had corpora lutea indicating that they had ovulated but either did not exhibit estrus or their behavior was not detected by the herdsman. Three sows (6%) had only cystic follicles.

Farrowing rate was affected by post-breeding treatment (table 2). More group-penned than individually-stalled sows farrowed ($P<.05$). This difference in pregnancy survival was already apparent at about 3 weeks after breeding, as indicated by serum progesterone levels. More individually-stalled sows than group-penned sows had low progesterone at this time ($P<.025$; table 3). When considered in regard to the physiology of pregnancy establishment, these observations suggest an increased incidence of pregnancy failure by 12 days after breeding in the individually-stalled sows. The cause of these pregnancy losses is not known. There were no significant effects on litter size attributable to the treatments (table 4).

Conclusions

Our results indicate no major effects of group or individual penning on the incidence of estrus, the interval to estrus, or litter size. However, the

farrowing rate for sows housed in individual stalls for the first 30 days after breeding is a cause for concern. We plan to study the physiology of sows penned in stalls and pens during early pregnancy to determine the reason(s) for these pregnancy losses.

Table 1. Effect of Group Pens or Individual Stalls on Sows' Return to Estrus After Weaning

Item	Treatment	
	Individual stall	Group pen
No. of sows assigned to treatment	137	137
No. in estrus by 10 days	116	108
% in estrus	84.7	78.8
Average interval to estrus, days ± SE[a]	4.51 ± .09	4.25 ± .10[b]

[a]Standard error of the mean.
[b]Less than for individually-stalled sows ($P < .05$).

Table 2. Farrowing Rate for Sows Penned Individually or as Groups.

Treatment		No. of sows: Inseminated	Removed from the study[a]	Farrowed (%)[b]
Weaning	Post-breeding			
Stall	Stall	60	2	39 (67.2)
Stall	Pen	56	2	43 (79.6)
Pen	Stall	57	2	37 (67.3)
Pen	Pen	52	3	40 (80)
Weaning treatments:				
Stall		116	4	82 (73.2)
Pen		110	5	77 (73.3)
Post-breeding treatments:				
Stall		117	4	76 (67.3)
Pen		108	5	83 (80.6)[c]

[a]Sows removed because of injury, sickness, or death.
[b]Total sows farrowing divided by (total sows bred minus sows removed) x 100.
[c]Lower farrowing rate compared with group-penned sows ($P<.05$).

Table 3. Effect of Stall or Pen Housing After Breeding on the Establishment of Pregnancy in Sows

Post-breeding treatment	Sows whose serum progesterone 19 to 23 days after breeding was:	
	Greater than 2 ng/ml	Less than 2 ng/ml[a]
Individual stall (%)	87[b] (78.4)	24 (21.6)
Group pen (%)	95 (89.6)	11[c] (10.4)

[a]Serum progesterone less than 2 ng/ml at this time indicates pregnancy has not been established and sows are preparing to recycle.

[b]Number of sows.

[c]Fewer group-penned than individually-stalled sows had low progesterone ($P<.025$).

Table 4. Litter Size for Sows Housed Individually or in Groups

Treatment		Total pigs farrowed	Live pigs farrowed
Weaning	Post-breeding		
Stall	Stall	9.6	9.2
Stall	Pen	9.8	9.3
Pen	Stall	8.9	8.7
Pen	Pen	9.7	9.0
Weaning treatments:			
Stall		9.7	9.3
Pen		9.2	8.9
Post-breeding treatments:			
Stall		9.2	8.9
Pen		9.8	9.1