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Sow and Litter Performance of Individual Crate and Group Hoop Barn Gestation Housing Systems: A Progress Report

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Abstract
The effects of swine gestation housing on sow and litter performance were evaluated at the Iowa State University Lauren Christian Swine Research and Demonstration Farm near Atlantic, IA. The gestation housing systems were 1) individual gestation crates in a mechanically ventilated, partially slatted floor, manure flush confinement building (CRATE); and 2) group pens in deep-bedded, naturally ventilated hoop structures (HOOP). The HOOP sows were fed in individual feed stalls. The sow genotypes were 1/4 Hampshire x 1/2 Yorkshire x 1/4 Landrace. Farrowing occurred every 2 weeks throughout the year.

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Introduction

The effects of swine gestation housing on sow and litter performance were evaluated at the Iowa State University Lauren Christian Swine Research and Demonstration Farm near Atlantic, IA. The gestation housing systems were 1) individual gestation crates in a mechanically ventilated, partially slatted floor, manure flush confinement building (CRATE); and 2) group pens in deep-bedded, naturally ventilated hoop structures (HOOP). The HOOP sows were fed in individual feed stalls. The sow genotypes were 1/4 Hampshire □ 1/2 Yorkshire □ 1/4 Landrace. Farrowing occurred every 2 weeks throughout the year.

Materials and Methods

The breeding protocol was to inject each sow with PG600 at weaning. The sows were moved from the farrowing rooms into group pens in the centralized slatted floor confinement breeding barn. Four days post-weaning heat detection with a mature boar was performed daily. Sows were artificially inseminated 24 hours after estrus detection. Sows were inseminated a second time 48 hours after initial estrus detection. Insemination occurred in the presence of a mature boar. At breeding, the sow was moved to an individual stall. Breeding continued for approximately 7 days/group. Semen was delivered within 24 hours of collection and two times/week. Sows were moved as a group to their assigned gestation housing by the ninth day post-weaning.

All first-parity gilts were gestated in individual crates, and thus were not included in the analysis. They were randomly assigned to a gestation group after breeding for the second parity. This practice was followed to minimize sow size differential and sow aggression in the group housing system. Sows, as a group, were moved to farrowing rooms 4 days before expected farrowing.

Group size was approximately 35 sows/group. The experimental unit was a group of sows. Sows were initially assigned to groups on a random basis based on housing availability. Sows remained in the same gestation housing treatment until culling. Culling occurred due to: poor performance, disposition, failure to conceive by third estrous, fitness (condition, lameness, size), and death. Sows were not culled due to age or parity. Culling cause was recorded.

There were 240 litters from CRATE sows and 193 litters from HOOP sows. The sow and litter data were summarized using PigCHAMP. Only sows that remained in their assigned gestation housing group were included in the analysis. Sows that switched gestation housing systems were not included in the analysis.

During gestation all sows were fed 4.5 lb/day of a corn–soy diet. During the last trimester, the gestation feed allowance was increased to 6 lb/day. During the winter, the HOOP sows were fed 25% more feed. Winter was defined as November through March. Weaning occurred at 17–19 days of age. Cross-fostering within 24 hours of birth was permitted to equalize litter size and pig weight.

Results and Discussion

The summary of 433 litters during 19 months (March 2001 through September 2002) is shown in Table 1. The data presented are raw means

and are preliminary in nature. This is a progress report and is not the complete study; therefore, conclusions should be considered preliminary.

Overall, sows gestated in the HOOP and CRATE gestation housing systems performed similarly. Apparent differences were observed for several items, when HOOP and CRATE sow performance was compared:

- Wean-to-breed interval–somewhat fewer days for HOOP sows.
- Pigs born alive/litter–somewhat more pigs/litter for HOOP sows.
- Combined fewer percentage of stillborn and mummified pigs–somewhat fewer from HOOP sows. However, the HOOP sows had apparently more mummies and fewer stillborn pigs than the CRATE sows.
- Pigs weaned/mated female/year–somewhat more pigs/sows/year from the HOOP sows.
- Cull and mortality rate–HOOP sows had a somewhat lower culling rate and mortality rate.

The preliminary data suggest that gestating sows can be successfully housed in deep-bedded hoop barns equipped with individual feeding stalls. The hoop barns may have partial positive attributes related to shorter wean-to-breed intervals and fewer stillborn pigs, perhaps because of increased exercise for the sow. The deep-bedded hoop barn may also provide an environment that encourages sow longevity as reflected by somewhat lower sow culling and mortality rates. However, these trends are merely preliminary indicators.

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Table 1. Performance of sows group housed in deep-bedded hoop barns or individual confinement crates during gestation.[1]

	HOOP Groups	Individual CRATED
Breeding performance		
Services, total no.	234	294
Wean-to-breed interval, d	7.5	9.6
Sows bred by 7d, %	92.5	88.1
Farrowing performance		
Farrowings, no.	193	240
Pigs born alive/litter, no.	11.6	10.6
Stillborn pigs, %	8.5	10.8
Mummies, %	2.3	1.7
Farrowing rate, %	88.1	85.4
Litters/mated sows/yr, no.	2.3	2.2
Farrowing interval, d	148	158
Weaning performance		
Pigs weaned/litter, no.	9.7	9.3
Pre-weaning mortality, %	14.2	13.5
Weaning age, d	20.3	19.8
Pigs/mated female/yr, no.	22.7	20.7
Culling rate, %	5.5	11.1
Sow mortality rate, %	1.1	5.1

[1]Period covered is March 1, 2001, through September 23, 2002.