

Performance of Pigs in a Swedish Bedded Group Lactation and Nursery System

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Summary and Implications

A Swedish deep-bedded, group housing system for pregnant, farrowing, and nursing sows and their litters was demonstrated. There are two versions of the Swedish system. Previous work examining the one system by Honeyman and Kent (1,2) concluded that pig growth (55–60-lb pigs) was excellent, and prewean mortality (18.4–28.3%) was the weakest part of the overall system. The second system was demonstrated in this study to reduce prewean mortality, whereas maintaining or improving nursery phase performance. Prewean mortality was reduced with the conventional farrowing crates (2%) used in conjunction with the bedded group lactation system. The preweaning mortality of the Swedish bedded system can be reduced by keeping the sows and litters in farrowing crates for the first two weeks until movement to the group lactation room. The rate of gain for the first week of group lactation (14–21 d) was 24% less for the group-lactated pigs than for the conventional pigs; however, during the next week the group lactated pigs grew 65% faster than the conventionally weaned pigs. Overall, the growth rate was similar, the group lactated pigs grew 7% faster than the conventionally weaned pigs. Additional research documenting the Swedish housing system is planned.

Introduction

In the 1980s, Swedish swine producers were forced to develop several production models to remain profitable due to the strict legal policies facing the swine industry. By 1994, approximately 150 Swedish farms were using a sustainable model for pig production. This model, was a deep-bedded, group housing system for pregnant, farrowing, and nursing sows and their litters, was known as the Västgömodel. Ljungström and Thorstensson are two versions of the Västgömodel system. In the Ljungström system, sows farrow in conventional pens and are moved with their litters to group nursing rooms after the pigs are 10 to 14 days old. In the Thorstensson system, sows farrow in group nursery rooms in temporary wooden farrowing boxes, which are removed after the pigs are 7 to 10 days old and have began to climb out of the boxes. Group lactation ensues (1).

In 1995, an existing 1950's style hog house was retrofitted as a deep-bedded facility to demonstrate the Thorstensson housing system at the Iowa State University Armstrong Farm, Atlantic, IA (1).

In 1997, Honeyman and Kent (2) summarized the results of 1-year operation of the Thorstensson housing system. Weaning occurred at 4.5 weeks of age (29.3 to 35 d). At weaning, the average number of pigs per litter was 8.5 pigs/litter with a weaning weight average from 17 to 28 lb/pig. After weaning the pigs remained in the nursery for 30 days and were sold at 60 days of age. Pig growth in the deep-bedded nursery was excellent with 60-lb pigs at 60 days of age and 1.25 lb/day average daily gain during the nursery phase. The authors concluded that the weakest part of the overall system was prewean mortality. Prewean mortality was 18.4 to 24.2% double the industry standard. Most of the mortality occurs during the first few days of life.

By 1999, five more groups in the Thorstensson housing system were analyzed and summarized. Nursery phase growth was excellent resulting in 55-lb pigs with a 1.22 average daily gain. Prewean mortality was 28.3 with 81% of the piglet death occurring by three days of age (3). These results were consistent with previous work by Honeyman and Kent (2). The authors concluded that the system would perform well if prewean mortality could be reduced (3). Preweaning mortality may be reduced by farrowing in conventional farrowing crates or pens and by moving the sows to group lactation when the pigs are 7 to 10 days old (Ljungström).

In 1999, The Ljungström system was demonstrated at the Iowa State University Armstrong Farm. The Ljungström system was implemented to reduce prewean mortality, while maintaining or improving nursery phase performance.

Methods and Materials

Seventeen sows were farrowed in conventional farrowing crates at the Iowa State University Lauren Christian Research and Demonstration Farm, Atlantic, IA. The trial was conducted in February and March. The sows were assigned to two treatments: conventional weaning (<21 d) and a group lactation with a 35 d weaning. On day 21, the conventional weaning group pigs (n=51) were weaned and placed in a fully enclosed mechanically ventilated confinement nursery with a plastic total slatted floor. There were eight pens (5 × 13 ft) in the experimental room and the middle four pens were used for the trial. Each pen was equipped with one nipple cup waterer and a 6-hole feeder (35.9 × 11.7 × 28.3 in.) with feeding spaces 5.7 in. wide and 4.0 in. deep. All conventionally weaned pigs had ad libitum access to four commercial diets in phase and water

throughout the 60 d trial. On day 14, the group lactation piglets and sows were transported 7 miles to a straw bedded group lactation building at the Iowa State University Armstrong Farm. For the next 21 days, the sows lactated as a group and were given ad libitum access to feed. The piglets had access to creep feed. On day 35, the sows were removed and the piglets were fed three commercial diets in phase for the remaining 25 days of the 60 d trial.

Results and Discussion

Performance of the two groups of sows and their pigs in the conventional farrowing room is shown in Table 1. The average number of pigs born alive per litter was 9.6 pigs for both systems. The average birth weight was similar (3.2 vs. 3.3 lb/pig).

Previous work by Honeyman and Kent (1) concluded that prewean mortality was high (18.4 to 24.2%) in the Thorstensson housing system, but that it may be reduced by using the Ljungström housing system. Prewean mortality was reduced in this study with the conventional farrowing crates (2%) used in conjunction with the bedded group lactation system (Table 1).

Weaning occurred at 21 days for the conventional weaned pigs and 35 days for the group lactation pigs. The group lactation sows weaned 9.6 pigs/litter and the conventionally weaned pigs had 9.6 pigs/litter.

Pig growth data are shown in Table 2. The weaning lag for the conventionally weaned pigs is apparent. The pig growth rate decreased 32% when comparing the week before weaning to the week after weaning. Growth rate for the group-lactated pigs increased steadily, including the week after weaning. The rate of gain for the first week of group lactation (14-21 d) was 24% less for the group lactated pigs than for the conventional pigs; however, during the next week the group-lactated pigs grew 65% faster than the conventionally weaned pigs. Overall, the growth rate was similar, the group-lactated pigs grew 7% faster than the conventionally weaned pigs.

Comparisons of feed intake and costs were not attempted. The conventionally weaned pigs required special diets beginning with the 21 d weaning. The group lactation pigs consumed some creep feed during the days 21–35. Also, the sows consumed greatly different amounts of feed. The conventionally weaned sows were limit fed after 21 days, but the group lactating sows were fed ad libitum for days 21–35.

Other major differences probably included the subsequent sow reproduction performance (wean-to-estrus interval, conception rate, litter size), housing costs, bedding costs, sow fatness, etc. However, it is clear, that the preweaning mortality of the Swedish bedded system can be reduced by keeping the sows and litters in farrowing crates for the first two weeks until movement to the group lactation room. Pig growth in the bedded group lactation and nursery room was equal to pigs conventionally weaned into a modern nursery facility with environmental control.

Additional research documenting the Swedish housing system is planned.

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References

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Table 1. Litter performance of sows in farrowing crates (before conventional and group lactation).

	Group	
	<u>Conventional</u>	<u>Group Lactation</u>
No. of litters	8	9
No. pigs born alive	77	87
No. pigs born alive/litter (ave.)	9.6	9.6
Ave. birth weight (lb)	3.3	3.2
No. pigs died prior to weaning	1	3
No. pigs weaned	76	84
No. pigs weaned/litter (ave.)	9.5	9.3
Parity	1.0	1.0

Table 2. Pig growth performance in conventional and bedded group lactation systems.

	Group	
	<u>Conventional</u>	<u>Group Lactation</u>
No. pigs weaned	52 ¹	81 ²
Ave. pig wt (0 d), lb	3.3	3.2
Ave. pig wt (14 d), lb	9.0	8.4
Ave. pig wt (21 d), lb	13.4	12.0
Ave. pig wt (35 d), lb	19.4	22.0
Ave. pig wt (60 d), lb	47.0	50.0
ADG (0-14 d), lb	.41	.37
ADG (14-21 d), lb	.63	.51
ADG (21-35 d), lb	.43	.71
ADG (35-60 d), lb	1.10	1.12
ADG (0-60 d), lb	.73	.78

¹Pigs (24) were removed at weaning to another experiment and one died prior to weaning.

²Pigs (3) were removed at weaning and three died prior to weaning.