

# Performance of a Swedish Deep-Bedded Feeder Pig Production System in Iowa

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### Summary and Implications

Operation (2.5 years) of a Swedish deep-bedded feeder pig production system, including nine farrowings are summarized. The system is designed to minimize pig stress and use no subtherapeutic antibiotics in the feed. Breeding and gestation occurred in a hoop building with cornstalk bedding. Conception rates and litter size were excellent. Farrowing occurred in a deep-bedded remodeled building. Sows selected bedded farrowing cubicles. Pre-wean pig mortality, mostly crushing, was high (28%), occurring primarily in the first 3 days. At 2 weeks of age, the cubicles were removed and group lactation occurred. Group lactation worked well with an average pig weaning weight of 23 lb at 36 days of age. At weaning (36 days) sows were removed, and the pigs remained in the farrowing/lactation room for 24 days. Nursery phase pig growth in the deep-bedded nursery was excellent resulting in 55 lb pigs at 60 days of age and 1.22 lb/day average daily weight gain. Overall pig health was excellent with no major clinical diseases confirmed.

### Introduction

At the Iowa State University (ISU) Armstrong Farm in southwestern Iowa, a Swedish feeder pig production system has been demonstrated for about 2.5 years. The Swedish system relies on bedding, simple buildings, intensive management, and keen husbandry for success. No subtherapeutic antibiotics were used in the feed.

### Methods

Breeding and gestation phases occurred in a hoop structure with individual feeding stalls. Hand mating and artificial insemination (AI) were used, with AI accounting for 70% of the matings. Large, round bales of cornstalks were used for the deep-bedded areas where the sows lived in groups. A 1950s-style hog house was remodeled for use as a farrowing, group lactation, and nursery facility. Farrowing cubicles with rollers and oat straw bedding were provided. The hog house was remodeled with "breathable" ceiling and exhaust fans. Two groups of 14 Yorkshire × Landrace sows bred to Hampshire boars produced feeder pigs in the system. Replacement gilts were added as

needed. The replacement gilts were bred and kept separate until farrowing when they were mixed with the older sows in the group.

### Results and Discussion

Overall, the Swedish feeder pig production system worked well. Conception rates were excellent (>95%). The hoop structure with cornstalk bedding and individual lockable feeding stalls provided a very good environment for the sows. Approximately 27 sq ft of bedded area was allowed for each sow. The combination of deep-bedded group housing with individual feeding stalls provided the advantages of group-housed sows as well as the advantages of individually crated sows. At the daily feeding, the group-housed sows were easily managed as individuals for various individual activities (AI, pregnancy checking, vaccination, etc.). Also, the sows did not fight for feed, which reduced the overall incidence of fighting.

Performance of the sows in the farrowing/lactation remodeled building is shown in Table 1. The average number of pigs born alive per litter was excellent (11.3 pigs/litter). Average birth weight also was excellent (3.9 lb/pig). The farrowing interval (7.6 days) was acceptable. A short (<7 days) farrowing interval is critical for group lactation to succeed (Table 1). Large litters of heavy pigs born in a relatively short time reflect an excellent breeding and gestation environment in the hoop structure. These results are consistent with Canadian research.

The weakest part of the overall system was farrowing, particularly prewean mortality. Prewean survival was 71.7%. Prewean mortality was 28.3%, about double industry standards. Most (81%) of the piglet deaths occurred in the first 3 days after birth and were due to crushing.

Weaning occurred at approximately 34 days of age. The average number of pigs weaned per litter was 8.1 pigs/litter. Weaning weight was 22.8 lb/pig with heavier weights from the mature sows and longer lactations (Table 1).

After weaning, the sows were removed and the pigs stayed in the deep-bedded lactation room that became a nursery. Nursery pig performance is shown in Table 2. The pigs remained in the nursery for 26 days after weaning. At approximately 60 days of age, the pigs were removed from the

nursery and sold. The average selling weight was 55 lb Average daily gain (ADG) during the nursery phase was 1.22 lb/day. No feed antibiotics were used in the nursery phase. Pig health was excellent. Death loss in the nursery phase was less than .7% i.e., six pigs died out of 928 pigs total.

Table 3 shows the litter data by parity. The older sows gave birth to the largest litters. However, the largest litters weaned and best piglet survival rates were from the second parity sows. Although this was a small herd, sow longevity was very good and culling rates were low.

Table 4 shows the overall reproductive performance of sows in the project. Because of the very high farrowing rate (95%) and large litters (11.3 pigs/litter), the litters/sow/year (2.35) and pigs born/sow/year (26.4) were excellent. However, pigs weaned/sow/year (18.9) was lower because of the high prewean mortality. This finding is particularly impressive when the longer lactation of 34 days is considered. These measures compare favorably with performance measures of the Iowa Swine Enterprise Records in each category, exceeding the top one-third of the producers, in spite of the higher prewean mortality.

The pigs, particularly the sows, were calm and easy to work with in the system. Sow fighting was not a problem. During the summer, hot humid weather made the sows very uncomfortable in the

farrowing building. This may have contributed to some of the piglet crushing.

If prewean mortality could be reduced the system would perform very well. Prewean mortality could be reduced by farrowing in conventional farrowing crates or pens and by moving the sows to group lactation when the pigs are 7–10 days old. Some Swedish farmers follow this approach.

The facilities were equipped with viewing areas and were popular. Approximately 3,500 people viewed the project. The project was featured on Omaha and Des Moines television stations. The deep-bedded Swedish system will continue to be researched in Iowa with the farrowing occurring in pens or crates and the sows and litters being moved to deep-bedded group lactation in an effort to reduce prewean mortality to make the system more competitive. The system may become more attractive to producers as niche markets for natural or organic pork develop.

#### **Acknowledgments**

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**Table 1. Farrowing phase results of a deep-bedded Swedish system in Iowa.**

	Group <sup>a</sup>									
	A-1	B-1	A-2	B-2	A-3	B-3	A-4	B-4	A-5	Average
No. of litters	14	14	14	14	13	12	12	13	9	13
Farrowing rate, (%)	100	93	100	100	100	86	92	87	100	95
No. pigs born alive	149	136	168	143	162	142	156	129	109	144
No. pigs born alive/litter (ave.)	10.6	9.7	12.0	10.2	12.5	11.8	13.0	9.9	12.1	11.3
Ave. birth weight (lb)	3.5	4.0	3.8	4.5	3.9	4.1	3.7	4.1	3.8	3.9
No. pigs weaned	113	105	142	117	103	81	100	100	67	103
No. pigs weaned/litter (ave.)	8.1	7.5	10.1	8.4	7.9	6.8	8.3	7.7	7.4	8.1
Ave. weaning weight (lb)	17.4	18.2	26.7	26.7	23.4	23.0	23.0	27.5	19.6	22.8
Ave. age at weaning (days)	31.6	29.3	35.1	34.4	35.3	35.2	35.3	34.8	33.8	33.9
No. pigs weaned/born alive (%)	75.8	77.2	84.5	81.8	63.6	57.0	64.1	77.5	61.5	71.7
Farrowing interval (days) <sup>b</sup>	13	7	5	7	6	5	4	9	7	7.6
Average Parity	1.0	1.0	2.0	2.0	3.0	3.0	4.0	2.4	2.7	2.3

<sup>a</sup>Groups are denoted by letters and numbers. The letter (A or B) refers to the group of sows and the number refers to the farrowing.

<sup>b</sup>Farrowing interval = no. of days from first to last sow farrowing in the group.

**Table 2. Nursery phase performance of a deep-bedded Swedish system in Iowa.**

	Group <sup>a</sup>									
	A-1	B-1	A-2	B-2	A-3	B-3	A-4	B-4	A-5	Average
No. pigs weaned	113	105	142	117	103	81	100	100	67	103
Ave. wean wt. (lb)	17.4	18.4	26.7	26.7	23.4	23.0	23.0	27.5	19.6	22.8
Ave. wean age (days)	32	29	35	34	35	35	35	35	34	34
Nursery duration (days)	29	27	26	27	28	26	23	22	27	26
Ave. selling age (days)	61	56	61	61	63	61	58	57	61	60
Ave. selling wt. (lb)	51	56	61	65	52	58	53	51	44	55
Ave. nursery ADG (lb/day)	1.14	1.39	1.29	1.36	1.14	1.31	1.30	1.03	.91	1.22

<sup>a</sup>Groups are denoted by letters and numbers. The letter (A or B) refers to the group of sows and the number refers to the farrowing.

**Table 3. Litter data by parity of a deep-bedded Swedish system in Iowa.**


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	No.	Total Born	Live Born	Still Born	No. Weaned	% Weaned
Parity 1	36	10.0	9.7	0.3	7.3	75.3
Parity 2	28	11.4	11.1	0.3	9.3	83.8
Parity 3	25	12.6	12.2	0.4	7.4	60.7
Parity 4	21	12.9	12.6	0.3	8.6	68.3
Parity 5	4	13.6	12.8	0.8	8.0	62.5

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**Table 4. Reproductive performance of a deep-bedded Swedish system in Iowa.**


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	Swedish Demonstration	ISU Swine Ent. Records <sup>a</sup>
Litter/Sow/Year	2.35	1.92
Farrowing Interval (days) <sup>b</sup>	155	190
Pigs Born/Sow/Year	26.4	19.1
Pigs Weaned/Sow/Year	18.9	17.5

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<sup>a</sup>1997 ISU Swine Enterprise Records Summary, top one-third of 102 operations reporting for farrow-to-finish.

<sup>b</sup>Farrowing Interval – average no. of days between parities.