

Performance of Pigs in Hoop Structures and Confinement during Summer with a Wean-to-Finish System

M. E. Larson, graduate research assistant,
M. S. Honeyman, associate professor,
Department of Animal Science

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Summary and Implications

Four groups of early-weaned pigs (19 days of age) were delivered in late May and early June 1998 to the Hoop Research Complex (HRC) at the ISU Rhodes Research Farm. Three groups of pigs (n=552) were placed in three (30 ft × 60 ft) deep-bedded hoop structures. The fourth group (n=159) was placed in six pens in a mechanically ventilated modular confinement building. On June 30, 1998, phase I of the experiment was over and pigs entered phase II. At the phase change, all pigs from each group were weighed and the number (n=711) of pigs was reduced (n=582) to allow the proper square footage per pig during the grow-finishing phase of the trial. In phase II, there were three groups of hoop pigs (n=451) and one group of confinement pigs (n=132). The four groups of pigs were returned to their original buildings with no mixing of pigs. The pigs were marketed in October and November. The hoop pigs ate the same amount of feed per day ($P>.10$), grew faster ($P<.02$), and were more efficient ($P<.02$) than the confinement pigs. By starting early-weaned pigs in hoops, wean-to-finish production may be an acceptable strategy for maintaining pig performance, without the moving and remixing done on many farms. Also, because of fewer turns of a wean-to-finish system, the lower cost hoop may be advantageous compared with higher-cost structures.

Introduction

A new single-stage technology being adopted by the swine industry is to put early-weaned pigs directly into finishing barns. This new technology is called wean-to-finish production. Wean-to-finish production eliminates the movement of pigs between buildings, resulting in less stress to the pigs, which may improve pig performance and efficiency. Labor is also reduced because of fewer cleanings and pig moving activities. However, it takes longer to turn and refill the building, which reduces throughput.

Producers running different sizes of operations have quickly adopted wean-to-finish technology. As with any new technology, a wide variety of variations can be seen. A wean-to-finish system challenges the way we normally manage weaned pigs. Special attention to ventilation, heaters, pig flow, floor slats, feeders, labor management, health and nutrition are just a few of the key areas needed for a successful wean-to-finish operation.

Because this technology is successfully working with new or retrofitted confinement finishing barns, it is reasonable to consider wean-to-finish for hoop structures. Hoop structures can be easily retrofitted for wean-to finish production.

The objective of this study was to document the performance of early-weaned pigs in hoop structures and confinement with a wean-to-finish system for phase I (nursery) and phase II (grow-finish).

Materials and Methods

Four groups of early-weaned pigs (19 days of age) were delivered between late May and early June of 1998 to the Hoop Research Complex (HRC). Three groups of pigs (n=552) were placed in three (30 ft × 60 ft) deep-bedded hoop structures to begin phase I of the trial. The fourth group (n=159) was placed in a mechanically ventilated modular confinement building. The pigs were injected with ivermectin, penicillin, and tagged on arrival to the HRC. All pigs were fed three pelleted diets in phase, during phase I (nursery). The pigs were manually fed three times daily for the first 8 days and twice daily for the next 7 days. For the last 11 days of the trial the pigs were fed ad libitum. Feeding mats were used until the pigs could make a full transition to self-feeders. During phase I, pigs were weighed on 0, 14, and 26 days of the trial (1).

On June 30, 1998, phase I (nursery) of the experiment ended and pigs entered phase II (grow-finish). During the phase change, all pigs from each group were weighed and the total number of pigs (n=711) was reduced (n=583) to allow the proper square footage per pig during the grow-finish phase of the trial (phase II). The stocking densities for finishing pigs in hoop structures were 12 ft²/pig and 8 ft²/pig in the confinement (2). With 12 ft²/pig, each (30 ft × 60 ft) hoop structure was designed to hold 150 pigs. The confinement pens (13.5 ft × 13 ft) were designed to hold 22 pigs each. Therefore, for phase II, there were three groups of hoop pigs (n=451) and six pens of confinement pigs (n=132). The pigs were vaccinated for erysipelas at the start of phase II. The remaining pigs were returned to their original pens with no mixing of pigs.

During phase II all pigs were weighed every 28 days, until a pen reached an average market weight of 240 lb. All pigs weighing 240 lb or more were marketed, whereas the remaining pigs were returned to their pens and fed until the next marketing. Subsequently when the pen average reached 235 lb, the second marketing occurred and all remaining pigs were marketed. Real-time ultra sound was used on all pigs to measure backfat and loin muscle area on the first marketing date.

All pigs were transported to the Excel plant, Ottumwa, IA, for processing. The hoop pigs were marketed on October 19 and November 3, 1998. The confinement pigs were marketed on November 11 and November 24, 1998.

During phase II, the pigs were fed five diets ad libitum. The diets were corn and soybean meal based. All pigs had free access to water and feed throughout the duration of the trial.

Each hoop was bedded with four to five large round bales of cornstalks for phase I of the trial. The bales were uniformly spread throughout the bedded area (20 ft × 45 ft) of the hoop.

Two rows of three standing bales were also placed in the hoop and used for future bedding. Additional bedding was added throughout the grow-finish phase of the trial as needed.

The phase I pigs that were removed at the change to phase II, were not included in the analysis. Therefore, the feed consumed by the removed pigs was taken out of analysis. The feed amount per removed pig was determined by taking the total feed consumed of each diet (per pen basis) and dividing it by the number of pigs and the number of days the diets were consumed.

Results and Discussion

The results of the trial are shown in Table 1. At the start of the trial, the hoop pigs were slightly heavier than the confinement pigs (12.6 vs. 11.9 lb) ($P < .006$). At the end of the trial, there was no difference in ending weights for the hoop and confinement pigs (259.6 vs. 260.0 lb). The average daily feed intake (ADFI) was similar for the hoop and confinement raised pigs (4.43 vs. 4.35 lb/day) ($P > .10$) for the trial.

During of the wean-to-finish trial, pigs raised in the hoop structures grew faster than the confinement raised pigs. The growth rate (ADG) was 7% faster for the hoop pigs than the confinement pigs (1.63 vs. 1.53 lb/day) ($P < .02$).

The hoop pigs were 4% more efficient than the confinement pigs. The hoop pigs had a feed-to-gain (F/G) ratio that was more efficient than the confinement pigs (2.7 vs. 2.8) ($P < .02$).

Performance of pigs in a wean-to-finish system will vary depending on the pigs' exposure to environmental extremes. Hoop structures provide less environmental modification so seasonal weather changes will have a greater affect on pig performance. This trial was conducted during mild "summer" months. Starting early-weaned pigs during cold "winter" months may be much more difficult. Overall, both housing systems performed well, considering this was the first wean-to-finish experience for the authors. During summer conditions of this wean-to-finish trial the hoop pigs grew faster and were more efficient than confinement pigs. This allowed the hoop pigs to reach market weight about 10 days faster than the confinement pigs on about 4% less feed.

Conclusion

During mild "summer" months, pigs in a wean-to-finish system performed well in deep-bedded hoop structures. The low-cost hoops may be particularly well suited for wean-to-finish systems. However, more work is needed to develop the management techniques for early-weaned pigs in hoops during cold weather.

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Table 1. Performance of wean-to-finish pigs in hoops and confinement during summer.

	<u>Hoop</u>		<u>Confinement</u>	
	Mean	SEM	Mean	SEM
Start wt.	12.6	.17	11.9	.12**
End wt.	259.6	1.60	260.0	1.13
ADFI, lb/day	4.43	.11	4.35	.08
ADG, lb/day	1.63	.03	1.53	.02*
F/G, lb fee/lb/gain	2.71	.03	2.83	.03*

* $P < .02$, ** $P < .01$