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# Farrow-to-Finish in a Hoop Barn: A Demonstration

## **Abstract**

A variety of systems are currently used for farrowing naturally raised pigs in cold weather. All generally rely upon a primary heat source capable of maintaining a room temperature of 50°F and auxiliary heat sources (heat lamps, bedding pack, hovers) to create a warmer microclimate for the young pigs. Hoop barns have been rapidly adopted by many niche market pork producers, primarily for finishing animals. With a growing interest in producing pigs for the naturally raised pork market, the National Pork Board, in cooperation with Iowa State University and private individuals, formed a committee to design a farrow-to-finish system utilizing one hoop barn per group of pigs.

## **Keywords**

Animal Science

## **Disciplines**

Agricultural Science | Agriculture | Animal Sciences

# Farrow-to-Finish in a Hoop Barn: A Demonstration

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## Introduction

A variety of systems are currently used for farrowing naturally raised pigs in cold weather. All generally rely upon a primary heat source capable of maintaining a room temperature of 50°F and auxiliary heat sources (heat lamps, bedding pack, hovers) to create a warmer microclimate for the young pigs. Hoop barns have been rapidly adopted by many niche market pork producers, primarily for finishing animals. With a growing interest in producing pigs for the naturally raised pork market, the National Pork Board, in cooperation with Iowa State University and private individuals, formed a committee to design a farrow-to-finish system utilizing one hoop barn per group of pigs.

## Materials and Methods

In early January, twin rows of metal farrowing pens with creep areas were set in a 30 × 84 ft hoop barn on the Allee Demonstration Farm near Newell, IA. On top of the farrowing pens, a secondary hoop structure was erected and covered with an uninsulated tarp. An area committed to farrowing pens, a creep area, and a service alley were enclosed by the secondary hoop and measured 20 × 60 ft. To decrease draft and hold heat within the interior hoop, the exterior walls of the pens were covered with plastic housewrap and individual pen doors were outfitted with plastic strips similar to those found in meat coolers. A 60-ft 150,000 Btu/hr radiant heater tube was mounted to the frame of the secondary hoop. Temporary electrical lines for heat lamps were also installed.

Pens measured either 6 × 6 ft or 5 × 6 ft. Each pen had a lockable door that could be used to keep a sow temporarily confined to a particular pen. At the bottom of each door, was an 8-in.-

high roller. The roller was removed when pigs began jumping over it, facilitating group lactation. Creep areas for all pens were 2 ft wide. Several 250-watt heat lamps and a plywood hover were utilized in all creep areas. Separating the two rows of pens was a 4-ft service alley used by farm staff to inspect and process pigs. All sows had access to a 5-ft-wide communal area running the length of the building and the 16-ft concrete feeding and watering station at the south end of the building. The building, excluding the sow feeding and watering station, was bedded using wood chips. Wood chips create a bio-deck, allowing for wastes to filter down from the surface and away from the young pigs more rapidly than straw, as well as reducing the fire hazard of heat lamps.

At weaning, the sows, pens, and interior hoop were removed. Young pigs were then allowed to grow in the barn where they were born. The gilts that had farrowed in February were rebred and were due to farrow again in July. The first batch of young pigs had not yet reached market weight and so were moved to another hoop barn for the final months of finishing. The hoop barn was then cleaned out and the farrowing pens were once again set up. During the summer, the interior hoop was not erected. Heat lamps were used in the creep areas, and two large box fans were also installed to increase airflow through the barn. If this system was to be successfully implemented, careful attention must be paid to the breeding program and available space. If producers wanted to reap the benefits of not moving pigs between farrowing and market, they would have to choose between longer periods of nonproductive sow days and multiple hoop barns suitable for farrowing.

## Results and Discussion

This report summarizes the results of one winter farrowing-to-finish cycle as well as one summer farrowing. In February 2004, 22 gilts farrowed

216 pigs for an average number born alive of 9.8 pigs/sow. Following natural pork protocol, pigs were weaned at five weeks of age. A total of 162 pigs or 7.4 pigs/sow were weaned with an average litter weight of 128 lbs. Prewean mortality was 25% with 94% of mortalities occurring within the first 24 hours after birth. Approximately 880 gallons of LP gas were used over the 5-week farrow-to-wean period. At \$1.03/gallon, total expense for LP gas was \$906.40 or \$5.59/pig weaned. A total of 5020 kW of electricity was also used, at a cost of \$0.08/kW. Total electric expense for winter 2004 was \$401 or \$2.47/pig weaned. Total energy cost/weaned pig was \$8.06. Finishing animals reached market weight and were sold 6 to 6.5 months after farrowing. A total of 150 animals reached market weight with a 7.4% death loss between weaning and market.

Utilizing the same pens and layout as the winter farrowed group, 14 second-parity sows were farrowed in July. Those 14 sows produced 130 live pigs or 9.3 pigs/sow. Following a 5-week lactation period, 89 pigs or 6.4 pigs/sow were weaned with an average litter weight of 122 lbs. Prewean mortality was 31.5% indicating that winter's cold might have been easier to manage than the heat and resulting restlessness of sows experienced during the summer. About 90% of the prewean mortalities occurred within the first 24 hours after birth. During the summer, heat lamps were once again utilized in the creep areas. Energy use for the heat lamps was 403.5 kW at \$0.08/kW. The energy cost for creating a warmer microclimate for the young pigs during the summer months was \$0.36/pig weaned. To increase sow comfort, two 30-in. barn fans were installed at the north end of the hoop barn. These fans were each capable of circulating up to 6,680 ft<sup>3</sup> of air/minute. Energy use for cooling totaled 286.5 kW or \$0.26/pig weaned during the summer months. Total energy costs for the summer farrowing was \$0.62/pig weaned. At the time of this report, the pigs born

in July were 3.5 months old and had not yet reached market weight.

Farrowing pigs for the naturally raised pork market presents several unique challenges. In both the winter and summer farrowing groups, prewean mortality in this particular design was very high. Additionally higher energy cost, particularly during the winter, might offset any facility cost advantage gained by using a low-cost but uninsulated structure such as a hoop barn. This system may be better suited for a milder winter climate. The success of cold weather farrowing in a hoop barn may be improved with slight modifications to the demonstrated design. The metal farrowing pens proved very difficult to keep warm and draft free. Use of other building materials as well as alternative designs of the interior hoop that are less prone to heat loss would be expected to improve the performance of the system. For more information on alternative winter farrowing systems, contact the MidWest Plan Service, Ames, IA, and request publication AED-47.

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