

2015

Demonstrating farrowing alternatives for small farms: Insulated tents for sows and pigs

Peter J. Lammers

Iowa State University, plammers@iastate.edu

Jay D. Harmon

Iowa State University, jharmon@iastate.edu

Follow this and additional works at: http://lib.dr.iastate.edu/leopold_grantreports



Part of the [Bioresource and Agricultural Engineering Commons](#), and the [Meat Science Commons](#)

Recommended Citation

Lammers, Peter J. and Harmon, Jay D., "Demonstrating farrowing alternatives for small farms: Insulated tents for sows and pigs" (2015). *Leopold Center Completed Grant Reports*. 484.

http://lib.dr.iastate.edu/leopold_grantreports/484

This Article is brought to you for free and open access by the Leopold Center for Sustainable Agriculture at Iowa State University Digital Repository. It has been accepted for inclusion in Leopold Center Completed Grant Reports by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.

Demonstrating farrowing alternatives for small farms: Insulated tents for sows and pigs

Abstract

This project demonstrated that modifying a commercially available yurt kit for use as a farrowing facility is possible, but is likely to be cost-prohibitive for most farmers. Results from this project included a producer guide for crate-free farrowing.

Keywords

Agricultural and Biosystems Engineering, Hoops and alternative livestock systems, Niche meat dairy and poultry

Disciplines

Bioresource and Agricultural Engineering | Meat Science



Demonstrating farrowing alternatives for small farms: Insulated tents for sows and pigs

Abstract: This project demonstrated that modifying a commercially available yurt kit for use as a farrowing facility is possible, but is likely to be cost-prohibitive for most farmers. Results from this project included a producer guide for crate-free farrowing.

Principal Investigator:

Pete Lammers
(formerly Iowa State University)
University of Wisconsin
Whitewater, WI

Co-Investigator:
Jay Harmon
Agricultural and Bio-
systems Engineering
Iowa State University

Budget:
\$17,696 year one
\$42,278 for year two

Q Is it feasible to use a commercially produced yurt kit for farrowing small groups of sows?

A This demonstration project monitored energy use, labor, pig performance, and internal and external thermal conditions in the yurt to determine sow/piglet performance.

Background

Pigs fill an important niche in integrated crop and livestock farming operations and have long been a key component of financially sound family farming in Iowa. Pork niche markets provide an expanding sales outlet for farmers unwilling or able to raise pigs at the scale typical of present-day commodity agriculture. Most alternative markets for pork require that pigs be farrowed in bedded systems that forgo the use of farrowing crates. Farrowing in a less-controlled environment requires different animal husbandry skills and knowledge than using farrowing crates. Beginning and established farmers who are thinking of adding pigs to their farms are very interested in management information for crate-free farrowing.

Because current consumer expectations dictate that pigs be produced year-round, crate-free farrowing options for cold weather are required. Many niche pork companies will not accept new producers into their program unless they agree to farrow pigs during winter months. Several crate-free farrowing systems for cold weather have been demonstrated in Iowa, often with the financial support of the Leopold Center. However, those alternatives generally require a permanent, well-insulated structure and/or tremendous amounts of energy to provide a suitable environment for the newborn pig. This project examined the feasibility of using an insulated tent, or yurt, as a bedded, crate-free farrowing environment for swine production in Iowa.

Approach and methods

One insulated 24-ft diameter yurt kit was purchased from a domestic manufacturer (Colorado Yurt Company, Montrose, CO) in spring 2012. The yurt was erected at the Allee (ISU) Demonstration Farm, Newell, Iowa, and modified to house pigs. Groups of four bred gilts were purchased and were farrowed seasonally in the yurt. Overall, two summer farrowings (August 15-September 27, 2012 and July 30-September 10, 2013) and two winter farrowings (February 8-March 22, 2013 and January 1-February 28, 2014) occurred. Throughout the project, energy use, labor, and pig performance were measured and recorded. Internal and external thermal conditions also were monitored.



A wooden lattice (part of the kit) was erected to frame the perimeter wall. Wooden rafters (approximately every 2' on lower wall) formed the roof.

Results and discussion

A work crew of five built the yurt structure in about eight hours. Another 40 hours of labor were needed to install pens, gating, bedding, feeders, waterers, and electrical utilities. Initial costs of the yurt kit and materials needed to modify it for pig production were approximately \$14,000.

The dates for the summer and winter farrowing groups were selected with the goal of farrowing pigs during Iowa weather extremes—the hottest part of summer and the coldest part of winter. Although pre-wean mortality rates for these farrowings were much larger than is typical in the U.S. pork industry, performance was similar to other crate-free farrowing systems.

Ambient temperature within the yurt was consistently 20-30°F warmer than the outside temperature during the winter farrowings. The lowest interior temperature during the first winter farrowing was 65°F, and sows were generally quite comfortable inside the yurt. The heated creep areas were used by the young pigs throughout lactation. Initially, sufficient heat lamps were provided to achieve a temperature near 95°F within the creep area. As the pigs grew larger, some heat lamps were removed.

While the 2013 winter was one of the warmest on record in Iowa, the 2014 winter was one of the most severe. Ambient temperature within the yurt remained 20-30°F warmer than outside temperatures, but interior temperatures within parts of the yurt were often below 32°F and occasionally fell below freezing. Warm creep areas for the nursing pigs were maintained using heat lamps. Unfortunately, the combination of insulation in the yurt and heat generation by the sows was insufficient to prevent unheated drinking water from freezing occasionally. Providing a supplemental heat source for the yurt structure may have prevented this, but was considered too great of a fire risk to attempt.

Thermal conditions were more variable during summer. Providing sufficient air movement through the yurt to keep sows cool on very hot days was extremely challenging. The peak of the roof was capped with a plastic dome which could be opened approximately 6 inches and air also could enter the yurt through the open doorway and windows. Several box fans were used in the summer to improve airflow, but keeping sows comfortable was difficult. The interior temperature of the yurt was only 2-4°F cooler than the exterior temperature during summer. Using water to cool sows on bedding can create challenges for the young pigs, even if dry, warm creep areas are provided. The sows were generally more restless during the summer farrowing and, as a result, pre-wean mortality was 10 percent higher during summer when compared to winter. This trend has been observed in most crate-free farrowing systems in Iowa.

As expected, electricity use for supplemental heating during winter was 6-7 times greater than in summer. Labor use per day for this system was slightly less in year two than in year one. This is not unexpected as labor usually becomes more efficient as staff becomes more familiar with a housing system and learns how to best



The yurt kit that was used included three windows in the side walls.

accomplish tasks within the building. Surprisingly, more labor was required during summer months than in winter for pig care.

Conclusions

The yurt is a modular solution for farmers seeking an insulated space to farrow a small group of sows during cold weather. Although the cost of a commercially available yurt kit is prohibitive to widespread adoption, it is likely that a more economical version could be built from recycled, locally sourced materials. Pig management strategies and techniques developed during this project will inform the continued refinement of crate-free farrowing systems for cold weather.

Education and outreach

Project findings were shared through several Iowa State University Extension activities. A field day was held August 15, 2013 at the Allee Demonstration Farm with approximately 20 attendees. Field day participants toured the yurt and discussed the construction of the structure. Initial results on farrowing productivity were discussed. ISU Extension Animal Industry Reports on this project were published in 2014 and 2015.

Lammers gave presentations to small and beginning farmers at these conferences:

- Putting Small Acres to Work—Getting started with pigs. December 2015. Rockford, IL. University of Illinois Extension. 35 participants.
- Missouri Organic Association Annual Conference—Housing for farrowing pigs. February 2015. Springfield, MO. 50 participants.

Several outreach efforts have begun but remain to be completed. An updated producer guide for crate-free farrowing is currently being reviewed for publication through the U.S. Pork Center for Excellence, Pork Information Gateway. (www.porkgateway.org) A recorded seminar on construction of the yurt and modifications for use as a farrowing structure has been prepared and is being reviewed for online posting through the Iowa Pork Industry Center. See <http://www.leopold.iastate.edu/news/on-the-ground/yurts-pigs>

Leveraged funds

Some additional support came from ISU Research and Demonstration Farms.

*For more information, contact:
Jay Harmon,
Agricultural
and Biosystems
Engineering,
4333 Elings Hall,
Iowa State University,
Ames, Iowa 50011-
3080;
(515) 294-0554,
jharmon@iastate.edu*