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Funding Impact Brief #3: Hoop Barns: Alternative Hog Production Systems Research

Leopold Center for Sustainable Agriculture

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Abstract
This publication looks at what's been learned from research on alternative hog production systems at Iowa State University, and other opportunities created by the Leopold Center's major investment in this work.

Disciplines
Agriculture
**Funding Impact Brief #3:**

**Hoop Barns:**

**Alternative Hog Production Systems Research**

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**About Hoop barns**

Principal investigator: Mark Honeyman, Professor of Animal Science, Iowa State University

A hoop structure or hoop barn is a simple tent-like structure made of tubular arches covered with a poly fabric tarp. Deep bedding is used to modify temperature extremes and absorb urine and feces. Because of the low cost of hoop structures and their versatility, hoops are particularly well suited for Iowa’s small and medium family farms.

In 1997, the Leopold Center funded an interdisciplinary group of faculty to address issues of pork production in Iowa. The “Hoop Group” was to research and demonstrate new systems in swine production that were distinctively different from typical hog confinement systems.

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**What did we learn?**

- The health of hoop pigs is similar to confinement raised pigs; hoop-raised pigs fight less, exhibit fewer stereotypical behaviors, and respond to stress with a lower cortisol rate than confinement pigs.
- The annual overall cost of pork production is similar between the hoop and confinement systems.
- There are no major differences in feed intake, growth rate, feed efficiency and pig mortality for pigs in hoops or confinement.
- Composting of manure can be accomplished effectively and easily with low-tech methods, however, nutrient losses from manure represent a significant concern for hoops and other systems.
- As a result of swine hoop barn work, ISU now leads research using hoop barns for beef cattle feeding, a system that is now being rapidly adopted across Iowa and results in much less feedlot runoff.

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**By the Numbers**

- $526,451 awarded by the Leopold Center (1997-2012)
- $1,231,272 externally leveraged funds
- 22 key organizational, agency and institutional partners
- 770 Iowa farmers built 2,100 hoop structures between 1996-2001

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**Why does it matter?**

Several surveys documented changes in Iowa agriculture related to swine hoop production systems. From 1996-2001, 770 Iowa farmers built 2,100 hoop structures. This shows that in a 5-year period there was a very rapid adoption of a new technology, even though the number of Iowa farms with hogs declined significantly during this time. Approximately 90 percent of the hoops were used for finishing pigs; 40 percent of these farmers composted to handle the manure. A survey of 2,600 stakeholders in the Iowa swine industry showed a belief that hoop production would help solve a variety of problems facing the industry.

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**Personnel supported**

- 9 ISU faculty member
- 32 undergraduate students
- 11 graduate students

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**Piglets in a hoop barn at the ISU Swine Nutrition Farm**

Credit: Leopold Center

Photo on back:

**Early hoop demonstration**

Credit: Leopold Center
About this series
Purpose: To communicate the impacts of long-term Leopold Center investments made in sustainable agriculture research, education and outreach on Iowa’s communities, economies and landscapes. This brief is the third in a series of six featuring:

1. Low-Input High-Diversity Systems ($357,479; 2004-2012)
2. Long-Term Agroecological Research ($900,000; 1998-2012)
3. Hoop Barns for Alternative Hog Production ($526,451; 1997-2012)
4. Regional Food Systems Working Group ($922,837; 2003-2012)
5. Bear Creek Riparian Buffer Project ($900,000; 1990-2012)
6. Practical Farmers of Iowa ($100,000; 2011-2012)

Each brief was prepared based on data gathered from project publications, and 2012-13 interviews with principal investigators and/or key partners. The analysis showed that for every dollar invested in these six projects, an additional $4.60 was leveraged complement or expand the work. Get all briefs: www.leopold.iastate.edu/change

Products
• 2 Swine Systems Options Conferences: 1996 (national; 230 attendees), 1999 (international; 350 attendees)
• 8 field days hosted and numerous tours at ISU research and demonstration farms, approximately 4,000 in attendance
• 1 Hoop Research Complex built at ISU – four hoops and a confinement finishing building
• 50 extension articles, 9 journal articles, 4 technical pamphlets, and many popular articles
• 20+ presentations at swine production meetings and 40+ extension presentations
• 3+ universities are modeling their research after the Hoop Group
• 1 website for information dissemination
• 2 listening sessions were hosted with interested farmers; producers provided feedback on hoop research direction
• Creation of the Pork Niche Market Working Group

Research partners
• 5 public sector partners:
  USDA-Agriculture Research Service’s Laboratory for Agriculture and the Environment, USDA-Sustainable Agriculture Research and Education, ISU Research and Demonstration Farms, Iowa Pork Industry Center, Iowa Beef Center
• 2 civic sector partners:
  Practical Farmers of Iowa, Wallace Foundation for Rural Research and Development
• 4 private sector and industry partners:
  Iowa Farm Bureau, Iowa Pork Producers Association, Iowa Cattlemen’s Foundation, Agro-Soyuz (a Ukrainian company that requested Hoop Group assistance for business development)
• 9 Collaborating Iowa State University Staff:
  Donald Lay, Steven Lonergan, Peter Lammers, Animal Science; James Kliebenstein, Economics; Jay Harmon and Tom Richard, Agriculture & Biosystems Engineering; Brad Thacker, Veterinary Medicine; Clare Hinrichs, Sociology

Leverage
Hoop barn research funded by the Leopold Center leveraged substantial amounts of additional funding totaling $1,231,272:
• $831,272 from USDA and USDA-North Central Region Sustainable Agriculture Research and Demonstration Program
• $400,000 from USDA-National Research Initiative

Future opportunities
The work of the ISU Hoop Group continues with the demonstration of a circular insulated tent, or yurt, for farrowing pigs in a bedded, crate-free environment, and by developing a management guide for farmers regarding managing sows and pigs in bedded, crate-free systems.

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