9-21-2005

Educational Programs: Alternative Swine Housing

Educational Programs

Jay D. Harmon
Iowa State University, jharmon@iastate.edu

Mark S. Honeyman
Iowa State University, honeyman@iastate.edu

Mark Boggess
National Pork Board

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

Part of the Animal Sciences Commons, and the Bioresource and Agricultural Engineering Commons

The complete bibliographic information for this item can be found at http://lib.dr.iastate.edu/abe_eng_conf/116. For information on how to cite this item, please visit http://lib.dr.iastate.edu/howtocite.html.

This Conference Proceeding is brought to you for free and open access by the Agricultural and Biosystems Engineering at Iowa State University Digital Repository. It has been accepted for inclusion in Agricultural and Biosystems Engineering Conference Proceedings and Presentations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Educational Programs: Alternative Swine Housing Educational Programs

Abstract
Swine production facilities in the United States have adopted technological advancements in response to problems and opportunities as they arise. The first pressure was due mostly to economics. To improve feed efficiency, animals were moved into climate controlled buildings. To reduce labor costs, manure was handled as a liquid through slatted floors and feed and water systems were automated. Larger buildings were used to gain economy of scale and to increase the overall income to the producer as the profit margin per pig marketed decreased. All of these innovations helped swine producers to more economically produce commodity pork.

Disciplines
Animal Sciences | Bioresource and Agricultural Engineering

Comments

This conference proceeding is available at Iowa State University Digital Repository: http://lib.dr.iastate.edu/abe_eng_conf/116
Introduction

Swine production facilities in the United States have adopted technological advancements in response to problems and opportunities as they arise. The first pressure was due mostly to economics. To improve feed efficiency, animals were moved into climate controlled buildings. To reduce labor costs, manure was handled as a liquid through slatted floors and feed and water systems were automated. Larger buildings were used to gain economy of scale and to increase the overall income to the producer as the profit margin per pig marketed decreased. All of these innovations helped swine producers to more economically produce commodity pork.

In recent years, environmental pressures have played a role in influencing the design of housing systems available to swine producers. Environmental legislation precipitated changes in manure handling, manure storage and building site selection.

Animal welfare and niche markets are now influencing housing selection and production practices. Niche markets are established to provide pork with attributes that some consumers view as adding quality. These fall into two main categories (Honeyman, 2005), quality attributes and credence attributes. Quality attributes claimed by many niche markets include certain genetics, taste or flavor, high quality, freshness and tenderness. These are generally not directly influenced by housing type. Credence attributes are aimed at perceived health concerns or social values of given consumers. These attributes may include antibiotic-free, growth promotant-free, no use of animal by-products in the feed, family farm raised, natural, organic, produced outdoors or with bedding, locally raised, humane rearing, known origin, or environmentally-friendly. Most of these traits are hard to quantify in the pork products but add perceived value in some markets. (Honeyman, 2005).

At first most swine producers were interested in alternative housing systems to reduce the capital investment required for swine production. Swine producers were finding that finishing buildings that held less than 400 to 600 head lacked the economy of scale and put them at an economic disadvantage over larger producers. Generally these smaller producers were willing to trade
labor, bedding costs and feed efficiency for the initial investment. As alternative housing systems became more accepted and available, niche markets developed that promoted alternative housing as a credence attribute for their markets. Many niche markets require a housing system that is different than that typically used by most swine producers for commodity pork production. These may include open pens, outdoor exposure, bedding in a solid manure system rather than a liquid manure system, a prohibition of gestation crates, and restrictions on the time that sows may be confined to a farrowing crate. Consumer perceptions associated with animal welfare concerns is influencing the usage of gestation and farrowing crates.

Swine producers needed education to evaluate their options and select the system that fit their needs and talents. Many were attracted to alternative housing systems by the lower initial cost and prospect of larger receipts as they sold to a niche market. They may have been naive to necessary management practices needed to make the system competitive. Managing pigs in an alternative housing system often requires additional husbandry skills that may not have been required in a more traditional confinement building. Producers that could manage pigs in a confinement building might find that they lack the knowledge and skill-set to manage pigs in an alternative housing system.

Producers also need assistance in evaluating niche market opportunities. They are largely unaware of the adjusted performance parameters for alternative housing systems such as poorer feed efficiency for finishing pigs or fewer pigs weaned per litter for farrowing systems. These are important factors when producers evaluate the return that a niche market may offer. Alternative production systems for niche markets, at times, will have higher production costs and producers must have the information to adequately evaluate the payback associated with required practices.

This paper outlines educational programs that focus on educating producers about alternative housing systems and what it takes to be successful.

**Iowa State University’s Hoop Group**

In the early 1990’s, innovators in the prairie provinces of Canada adapted the Japanese tunnel housing to a heavier arched hoop barn covered with a tough poly fabric cover. The Canadian hoop barns were built to withstand the temperatures and winds of Manitoba and Saskatchewan. Wheat straw was commonly used for bedding. (MWPS, 2004a)

In the mid-1990’s, hoop structures started to draw the interest of small and medium size farmers that were attracted by the ease of construction and lower capital costs. About that same time, Iowa State University (ISU) constructed a hoop structure to begin investigation of performance and management of swine housed in hoop structures in Iowa. A group of faculty from various disciplines came together to form Iowa State University’s “Hoop Group”. The focus of the team was to answer some of the many questions that Iowa swine producers had about the system through research and demonstration.

It was apparent early that swine producers needed education about the opportunities and challenges involved in using alternative production facilities. Some producers adopted hoop structures before questions about their usage in Iowa could be researched adequately.
Education was provided to alert producers to the possible advantages and disadvantages based on the latest information. As more information became available, this was transferred to producers. The upper Midwest with its tradition of family farm-based pig production was a good place for the rapid adoption of these technologies.

The overall goal of the educational program was to provide swine producers, or potential swine producers, with the tools to make informed decisions about alternative housing systems and their usage in providing pork for niche markets. This continues and includes discussing the positive and negative aspects of various housing systems, what skills are necessary to manage the system, possible expected performance and approximate production costs associated with the various systems. Promotion of any given system was avoided. It was also found that many small to medium producers lack quality production records, making it difficult for them to truly know how their cost of production relates to the price received for niche market pork.

The educational program was delivered using several different avenues designed to meet the needs of various producers. These included presentations at various local Extension meetings, field days at research and demonstration farms, formal publications (MWPS, 2004a-d), informal education through research reports and popular press, a web page (ABE, 2005), and conferences for producers and scientists.

Even before the Hoop Group received research funds from USDA and the Leopold Center for Sustainable Agriculture, producers were provided with basic discussions of advantages and disadvantages of hoop structures that they should consider. These were provided in an early addition of MWPS, 2004c. Advantages included:

1. Low capital investment;
2. Ability to use for other purposes;
3. Uses solid bedding;
4. Structure can be built quickly;
5. Uses very little, if any, energy;
6. Qualifies for some niche markets.

Disadvantages included (MWPS, 2004c):

1. Observing animals in a large pen is more difficult;
2. Poorer feed efficiency in cold weather;
3. Additional labor is needed;
4. Requires large amounts of bedding;
5. Can not exclude some animals and birds that may carry disease.

Research conducted by the Hoop Group fed new information into the Extension program as it became available (Honeyman and Harmon, 2003; Lay et al., 2000). Some of the questions addressed came directly from producer advisory groups and included information on:

1. Diet formulation;
2. Bedding management;
3. Manure nutrient value and handling;
4. Complete economic analysis;
5. Management of the winter building environment;
6. Space needs;
7. Heat stress management;
8. Typical health problems;
9. Composting mortalities using spent bedding;
10. Sorting and handling pigs at marketing; and
11. Expected differences in odor and ammonia compared to confinement buildings.

As the usage of hoops became more accepted, questions about use for gestation and farrowing were fielded. Research projects, demonstrations and education were undertaken in this area as well. Many producers in Iowa are using hoop structures for housing gestating sows. There is also growing interest in hoop usage for dairy and beef production with lesser interests in horses, sheep and other species.

Iowa State University’s Hoop Group has been responsible for many outcomes and impacts from the research and educational program. A few of the outcomes and impacts have been tabulated based on the hoop group’s activities. These include:

   a. Attendance of 350.
2. Hosted more than 16 field days and numerous tours.
   a. Over 4000 in attendance.
3. Published more than 63 Extension articles or research reports, 12 journal articles and numerous popular press articles. Many are on ABE (2005) or IPIC (2005) websites.
4. Hoop group members have been invited/selected speakers at numerous (more than 25) US and international swine production conferences.
   a. Approximately 330 individuals attended from 10 countries and 14 states.
   b. Seven educational bulletins were available in a notebook for the meeting (MWPS, 2004a-g). Nearly 3000 total copies have been distributed to date.
   c. A website with presentations was developed (ABLS, 2005).
6. An international scientific symposium held in conjunction with the September 2004 conference drew more than 50 people.
7. Since 1996 more than 2200 hoop barns have been constructed in Iowa to produce swine.
8. Partnered with Practical Farmers of Iowa, a grassroots farmer group, to conduct farm visits and on-farm research related to alternative swine production systems and niche markets.
9. Recently started research and demonstration projects related to feeding beef cattle in bedded hoop barns.

**Purdue University’s “Sow Gestation Housing: Considering the Options”**

Sow housing has been of particular concern to many people. The general populace has become concerned about the welfare of sows, particularly of those kept in gestation crates. Producers, who have always been concerned with the welfare of their sows, want to evaluate the options of
different housing systems as their facilities reach the age that they will need replacing. They are also concerned about the impacts that future legislation concerning gestation crates may have on their current facilities.

Purdue University faculty have developed a sow gestation housing education program through a grant with USDA/CSREES. The DVD/CD educational package includes several components that use Purdue (2005a) as the point of delivery. The package includes the following:

1. Conference proceedings on sow housing: Symposium on Swine Housing and Well-Being including talks on:
   a. Intensive and Extensive Confinement Management Practices and Their Effect on Animal Well-being;
   b. Niche Market Development;
   c. Certification Programs;
   d. Consumer Perspectives.
2. Sow housing care and welfare bibliography;
3. DVD/CD video features the presentations made by various academics on different sow housing systems (stalls, small groups, large groups, and hoops/extensive systems).
4. DVD/CD video "Sow Gestation Housing: Considering the Options" (Purdue, 2005b) features visits to five farms using different methods to house sows. These include stalls, small pens, large groups with electronic sow feeding systems, outdoor system, and a hoop system. Producers describe their systems and explain their decision to use a particular sow housing system.

**National Pork Board**

The National Pork Board sees alternative housing as an important issue to swine producers and developed a research project to address some aspects. They have sponsored educational efforts related to alternative housing as well.

The farrowing research project focused specifically on farrowing systems that meet the needs of niche markets. The concept was a small hoop inside of a larger hoop. The small hoop housed farrowing pens and was heated and bedded. Piglets remained inside this area for a week or more with the sow able to exit into the common area. Once piglets were able to “escape” the farrowing pens, sows and piglets interacted in one large lactation group. This project has been piloted on several sites and a final report will soon be available. (NPB, 2005)

NPB have included several topics on sow housing at the Pork Academy, held each year before the World Pork Expo, and at the Swine Educators Meeting that it hosts for Extension personnel and agricultural teachers at community colleges. Topics have included farrowing facility options and gestation housing design. They also funded a study to examine the costs associated with housing options that do not use gestation crates.

**Education for Teachers**

The Midwest Plan Service (MWPS) pamphlets, which were developed during the summer of 2004, were used as a basis for the development of a series of lessons and PowerPoint visual
support materials for vocational agriculture instructors and extension professionals. During the spring semester 2005, the students in a senior level course at ISU that dealt with methods of teaching in agricultural sciences and agribusiness created lessons and supporting visual aids. Their work will be used to produce materials to train students in agricultural classrooms of high schools and community colleges. The training will focus on alternative production and housing systems for life-cycle swine production.

The materials will be distributed in hardcopy and electronic versions through national programs like MWPS, the National Pork Board’s PIG Gateway, or vocational agriculture curriculum dissemination systems.

Summary

Alternative swine housing systems can be used effectively to address the problems of high capital costs of swine facilities, niche market requirements and animal welfare concerns. Swine producers and the public need education about the options. They should understand that removing automated equipment requires different husbandry skills than those utilized in confinement buildings. They should also be aware there are differences in production parameters which may increase operating costs and that record keeping is a very important part of evaluating niche marketing contracts. Multiple delivery methods of delivering educational programs to swine producers and stakeholders are available and are successful in empowering swine producers to make decisions about housing options. Traditional extension and vocational agricultural education delivery systems coupled with new technologies of web pages and CDs plus strong partnerships with sustainable agriculture, farmer, niche market, and commodity groups has created effective education and rapid adoption of these alternative swine production systems.

References


Purdue. 2005b. Sow Gestation Housing: Considering the Options. DVD-AS-569. Purdue University, W. Lafayette, IN.