
Research and demonstration updates: ISU Rhodes Research Farm and PFI on-farm cooperators data (Sessions 2F and 3D)

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A recently completed study compared the economic return of hooped buildings versus conventional facilities. Factors considered included pig growth rate, feed efficiency, developing growth function, distribution of growth, production costs and returns, and rate of return on investment.

The bottom line is quite similar between confinement and hoop systems. The decision about which system to use is a management choice, and can be based on the availability of labor versus capital resources.

One comparison was conducted at the Rhodes Research Farm, where there are three hooped structures and one confinement facility. The research has involved animal scientists, veterinarians, economists and ag engineers. They looked at the environment, animal health and behavior, variability, how pigs were moved, and other factors. In one group of summer pigs, hoops had slightly superior feed efficiency in summer, but poorer in the winter.

Labor efficiency: Time spent per pig in

confinement, 0.21 hours; compared to time spent per pig in hooped facility, 0.27 hours.

Cost: The largest differences in cost were in capital, bedding and feed expenses. Pigs raised in hoops required less capital but bedding and feed expenses were more.

Consumer willingness to pay for pork: Jim Kliebenstein reported on a study that showed consumer willingness to pay for pork produced in an "environmentally-friendly" manner. His research showed that two of every three participants in the study were willing to pay between 8 percent and 22 percent more for pork, respectively, depending on the level of environmental stewardship for odor and water quality.

Pig mortality: Mark Honeyman said the Rhodes study showed different death losses in summer and winter. In winter, hoops had a pig mortality rate of 3 percent, compared to 1.5 percent for confinement system. In summer, hoops had a pig mortality rate of 2 percent, compared to 4.5 percent for pigs in confinement.

Pig performance: Jay Harmon said pigs in the trial came from the same source, and were medium lean gain pigs. Results showed that pigs raised in hoops were 2.5 percent less lean in the summer, which could have resulted from the differences in housing or in nutrition. All pigs were scanned and lean gain per day was computed. Slaughter data showed a 1 percent difference in lean gain.

Members of the audience asked about the accuracy of the measurement and formula used to calculate lean gain percentage. Early-weaned pigs also seemed to be doing fine in hoops during cold weather, except they might have a problem making the transition from fall to winter weather. Pigs usually sleep in a certain area, but as the weather changes, the nesting area wasn't large enough.

Animal behavior: Don Lay reported results of his study to see if pigs in hoops experience the same amount of stress. He found the biggest differences were related to bedding and the size of the group.

Pigs raised in hoops are limited in the number of resources such as feeders and waterers. Groups of pigs would tend to get up together and fight at the feeder and waterer. There also was fighting during hot weather, or when one pig walked over another pig to lay down. In general, however, pigs raised in hoops fought less than pigs raised in a confinement facility because hoop pigs have activities to occupy their time. Pigs in confinement rested more than pigs in hoops, and when not resting they were observed fighting, chewing on ears, nosing bellies, biting tails and manipulating other pigs. Pigs raised in hoops were observed in more play behavior.

Lay said future research will evaluate pig stress and immune response differences. He said he also wanted to look at feeding alternatives, drinking space allocation, and effects on group dynamics. The research unit can replicate a barren pen, which is the primary cause of pig stress. The current study uses 8 sq. ft. of space per pig in confinement, versus 12 sq. ft. per pig in a hoop facility.

Practical Farmers of Iowa (PFI) demonstrations: Mike Duffy reported by PFI cooperators have logged data on labor spent in hoop facilities. For 12 hoops, producers spent an average of 0.272 hours per pig; for 12 hoops, producers spent an average of 0.29 hours per pig. In one hoop used for breeding and gestation, average labor per sow was 1.3 hours.

Duffy said the data was sorted by the type of bedding used and type of time spent (to check bedding, feeding, sorting, and veterinary/medical care). Data was consistent with producers throughout the state. Data also was consistent when divided by the type of task that was done.

The overall labor efficiency for pigs in confinement is 0.21, compared to 0.27 for pigs in hoops. Some producers, however, may consider the quality of labor, higher in hoop structures than for confinement facilities.

Other comparisons: PFI cooperators said bedding costs are variable, depending on whether the bedding is purchased or produced on the farm. The mortality rate also seems to be affected by bedding. They had not been able to determine any differences in percent lean and yield, but found they could load out hogs from a hoop facility much easier than from a confinement facility. PFI cooperators said they

have fed pigs in hoops the same way they did in confinement, but that hoop pigs tended to grow faster. Some cooperators said they feed more fiber to hoop pigs to slow down growth.

One producer has kept records on three 30 x 84 ft. hoops. His records showed that he spent 7.02 minutes per hoop per day on labor for cleaning.

Paul Mugge, who has a hoop operation with another producer, reported an average daily gain of 1.5 to 1.7 for pigs and F/E of 3.3 to 3.6. He found death loss to be very low, and that pigs in hoops are more

uniform than they are in outside feeding. He starts with six inches of corn cobs in the hoop, which has worked well. Pigs come out of a SEW nursery, and he had 0.2 hr. labor per pig.

QUESTIONS:

What about leaching under the hoops? Is there research that addresses this potential problem?

Usually the dirt is not muddy under a hoop building. The ground is packed under the bedding, so leaching is not a problem.

Mugge summarized his data in the table on the following page.

Producer data on hoops operations

| <u>Dates</u> | <u>Pen # started</u> | <u>Initial Avg. Wt.</u> | <u>current Facility</u> | <u>Pen Days</u> | <u>Avg. Wt</u> | <u>Avg. total days to 230 lbs</u> | <u>Test Pd. Days</u> | <u>Avg. Days Fed to Market</u> | <u>ADG</u> | <u>Feed (AF) to Gain</u> | |
|-------------------|----------------------|-------------------------|-------------------------|-----------------|----------------|-----------------------------------|----------------------|--------------------------------|--------------|--------------------------|--------------|
| 12/15/97-05/12/98 | hoop-12/87 | 169 | 51.8 | hoop #1 | 21992 | 247 | 185 | 149 | 127 | 1.55 | 3.46 |
| 12/15/97-05/11/98 | barn-12/97 | 193 | 50.9 | home-n shed | 26700 | 250.2 | 184 | 148 | 131 | 1.54 | 3.35 |
| 04/06/98-08/31/98 | toms-4/98 | 373 | 46.8 | toms | 49185 | 249.8 | 183 | 148 | 130 | 1.57 | 3.34 |
| 05/04/98-09/28/98 | hoop-5/98 | 169 | 52.2 | hoop #1 | 23413 | 257.3 | 182 | 148 | 133 | 1.54 | 3.24 |
| 05/04/98-09/29/98 | barn-5/98 | 223 | 55 | home-n-shed | 30989 | 256.7 | 180 | 149 | 130 | 1.57 | 3.14 |
| | | 225.4 | 51.34 | | 30455.8 | 252.2 | 182.8 | 148.4 | 130.2 | 1.554 | 3.306 |

| <u># started</u> | <u># Mark eted</u> | <u>Sort Loss</u> | <u>Avg. B.F.</u> | <u>Avg. Lean</u> | <u>Avg. Yield</u> | <u>Feed/cw t.gain</u> | <u>Nonfeed /cwt.gai</u> | <u>Fixed/ n cwt. Gain</u> | | |
|-------------------|--------------------|------------------|------------------|------------------|-------------------|-----------------------|-------------------------|---------------------------|------|-------|
| 12/15/97-05/12/98 | hoop-12/87 | 169 | 164 | -0.14 | 0.92 | 51.4 | 74.86 | 20.51 | 1.58 | 25.34 |
| 12/15/97-05/11/98 | barn-12/97 | 193 | 189 | 1.02 | 0.74 | 53.9 | 19.19 | 1.84 | 1.57 | |
| 04/06/98-08/31/98 | toms-4/98 | 373 | 365 | 0.86 | 0.9 | 50.9 | 18.71 | 5.51 | 0 | |
| 05/04/98-09/28/98 | hoop-5/98 | 169 | 167 | -1.88 | 0.74 | 54.1 | 18.72 | 1.57 | 2.59 | |
| 05/04/98-09/29/98 | barn-5/98 | 223 | 207 | -1.27 | 1.01 | 50.4 | 18.96 | 1.93 | 1.43 | |
| | | 225.4 | 218.4 | -0.282 | 0.862 | 52.14 | 74.86 | 19.218 | | |