

# An Economic Analysis of Pork Production in Hoop and Confinement Facilities: A Winter Comparison

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## Introduction

This report is part of an ongoing research project that is being conducted at the Iowa State University Rhodes Research Farm. This research is aimed at comparing two swine finishing facility types under a wide range of circumstances. This report provides results from a group of pigs finished during the winter season of 2000–2001. The evolution of the swine industry has forced industry members to reevaluate their operations and utilize an increasing amount of risk management. A survey conducted in May of 2001 showed that hoop buildings are becoming an increasingly important part of the swine industry. Hoop buildings became widely available in 1995 or 1996 and have grown to represent 4% of the market hogs finished in Iowa.

## Materials and Methods

The following is a report that details the seventh group of hogs, which were on test from September 27, 2000, until February 21, 2001, at the Rhodes Research Farm. Results are evaluated with the actual production numbers while using the average or typical costs for feeder pigs, feed, and average market hog prices. This allowed for comparison of expected costs and returns for normal input costs and hog price conditions. Future reports will examine the risks and efficiency of the use of capital of the two systems. Prior reports have evaluated results for previous groups of hogs raised in the hoop and confinement facilities.

## Results and Discussion

*Productivity.* Production efficiencies have a large and direct effect on the economics of the operation. Important information is percent of pigs marketed, feed efficiency, and average daily gain. The percent of pigs marketed also has a direct effect on the system's returns because the pigs marketed need to cover the entire system costs. Feed efficiency shown in this report reflects this by using the weight of the marketed animals (at the plant) and the total feed consumed by the group on test. During this trial, the hoop facilities marketed more than a full percentage point less hogs, with 94.7% of the confinement hogs and 93.68% of the hoop hogs being marketed (Table 1). Feed efficiency was .39 pounds of feed/lb of gain higher for the hoop pigs than for the confinement pigs. Feed efficiency was 3.53 for the hoop pigs and 3.14 for the confinement pigs.

The hogs fed in the confinement system had an average daily gain that surpassed the hoops by 1/10 lb/day. The confinement hogs started lighter (3.17 lbs), were on feed eight fewer days, and finished almost a full pound heavier than the hoop pigs. The confinement pigs also had 3/10% higher yield than the hoop pigs. This resulted in the confinement system marketing 1.53 lbs of carcass weight more/hog (200.93 vs. 202.46).

The distribution of average daily gains using farm weight is shown in Figure 1. The graph demonstrates that the confinement system had a narrower range and a higher average daily gain. This may have been reflected by the stocking pattern, but was also influenced by the weather patterns. The hoop pigs were brought in over a three-week time period and were marketed in one day (Table 2) while the confinement system hogs were started all at the same time and also sold at the same time. However, with this group,

the confinement system was able to turn their system eight days sooner than the hoop system or take the pigs to a higher weight in the same time period.

*Economic Results.* Economic results provide a comparison of costs and returns of the two production systems. Sensitivity tables will provide information showing the impact of changes in selected costs, revenue, or production efficiencies such as feed price, feeder pig price, etc.

Facility costs are budgeted at \$180/pig space for a confinement operation and a \$55/pig space for the hoop system (Table 3). Fixed costs were calculated at 13.2% of the investment for confinement and 16.5% for hoops. The confinement facilities are depreciated over 15 years, whereas the hoops are depreciated over 10 years. Insurance and taxes represent 1.5% of the fixed investment, with interest at 10% for both confinement and hoops. The confinement could turn the facilities 2.59 times a year, while the hoops could be turned 2.45 times a year.

Fuel, repairs, utilities, vet, medical, marketing, and miscellaneous costs are based on Iowa State University and Midwest Plan Service, Livestock Enterprise Budgets. Bedding for this group was 336 lb/hog marketed with a cost of \$20/1,200 lb. Labor was valued at \$10.00/hr with .2 hrs/head in the confinement and .27 hrs/head for the hoop hogs. Feed prices were set at \$.06/lb, which is a typical average price with grind, mix, and delivery included. All the feed used was applied only to the pigs that were marketed.

Feeder pigs as well as market hog prices were calculated using a rounded average price from the 1990 to 1999 time period. The feeder pig prices took into account costs from dead or culled pigs as well as a 10% interest rate that is charged against all expenses except labor and marketing costs. Market hog prices were

switched to carcass weight basis in order to take into account the yield differences and lean premiums. The yield premiums for the confinement pigs was .3% and the lean premium was \$.46/carcass hundred weight based on sales to Excel. The lean and yield premiums for the hoop system were based on the hogs in the second hoop building. These hogs reflected a marketing weight, which was close to the confinement pigs' sales weight. This was necessary since pigs in one hoop building had much higher weight than the confinement pigs and another had a much lower weight due to the length of each group on feed. It should be noted that the lean premiums would vary depending upon the packer that is used. The revenue from the culled hogs was estimated as half the revenue from a marketed hog per cwt live weight.

The result of the trial is that, for this winter group, there was a total difference in net revenue of \$9.26/hog marketed, with a net cost difference of \$7.41/hog marketed in favor of the confinement system (Table 3). This is due to a \$12.35 reduction in operating costs and a -\$1.15 difference in cull pig revenue overcoming higher fixed costs of \$5.09/pig. Operating costs represented the largest difference, with bedding or feed costs differences alone offsetting the lower fixed costs. The total bedding for the hoop system saw its highest total to date with almost a \$6.00 cost/pig. This, in part, can be attributed to the difference in weather conditions; the winter was quite severe. The confinement system received an additional \$1.85 in revenue/pig. The revenue was calculated by using the carcass weight of the average pig for each facility type on trial and multiplying it by the average value per carcass weight received from 1990 to 1999, \$60 (rounded to the nearest dollar). The confinement system also had a \$.46/carcass hundred pounds added value due to the lean premium advantage over the hoop system.

**Table 1. Productivity information table.**

	<b>Hoop</b>	<b>Confinement</b>	<b>Difference</b>
Total pigs started	459	132	
Start weight	34.7	37.9	-3.17
Culls	9	3	6.00
Cull rate	1.96%	2.27%	-0.31%
Death	20	4	16.00
Death loss %	4.36%	3.03%	1.33%
Average daily gain*	1.71	1.81	-0.10
Total days	57606	15750	
Total feed	348522	89734	
Feed efficiency*	3.53	3.14	0.39
Farm sale weight	275.75	273.53	2.22
Plant sale weight	262.32	263.28	-0.96
Yield	76.60%	76.90%	-0.30%
Hot carcass weight plant	200.93	202.46	-1.53
Average days on feed	134.00	126	8.00
Facility days	142.00	134	8.00
Percent pigs marketed	93.68%	94.70%	-1.02%
Pigs marketed	430	125	

\*Using plant sale weight

**Table 2. Marketing information.**

	<b>Hoop pigs marketed</b>	<b>Confinement pigs marketed</b>	<b>Hoop percent marketed</b>	<b>Confinement percent marketed</b>
02/15/01	459		100	
2/21/01		132		100
Total	459	132	100	100

**Table 3. Group seven swine grow finish production budget.**

Item	Hoop	Confinement	Difference
<b>Facility Investment</b>			
Building (per pig space)	\$55.00	\$180.00	-125
Feed & manure handling	\$36.00	\$36.00	0
Total initial investment	\$91.00	\$216.00	-125
2.6 Turns/Year final day out + 8 days	2.45	2.59	-0.14
Total initial investment per turn	\$37.15	\$83.44	-\$46.29
<b>Fixed Cost</b>			
Percent interest taxes, depreciation, insurance	16.5%	13.2%	
Facility cost per hog marketed	\$6.54	\$11.63	-\$5.09
Fixed cost per CWT marketed	\$2.49	\$4.42	-\$1.92
<b>Operating costs</b>			
Feeder pigs	\$38.00	\$38.00	\$0.00
Feeder pig death loss	\$2.56	\$2.13	\$0.43
Interest on feeder pig	\$1.35	\$1.27	\$0.09
Fuel repairs utilities	\$1.07	\$1.06	\$0.01
Bedding	\$5.98	\$0.00	\$5.98
Feed (\$.06/LB)	\$48.65	\$43.07	\$5.58
Vet/Med.	\$1.60	\$1.58	\$0.02
Interest on mixed costs	\$1.02	\$0.80	\$0.22
Labor	\$1.50	\$1.50	\$0.00
Marketing costs	\$2.88	\$2.85	\$0.03
Total operating cost	\$104.61	\$92.26	\$12.35
Operating costs/ CWT marketed	\$40.89	\$35.04	\$5.84
Total cost (per pig marketed)	\$111.16	\$103.90	\$7.26
Total cost per CWT*	\$42.38	\$39.46	\$2.91
Revenue from cull pigs per head	\$1.00	\$1.15	-\$0.15
Net cost (per pig marketed)	\$110.15	\$102.74	\$7.41
Net cost pr CWT*	\$43.00	\$39.02	\$3.97
Lean premium difference (per hot CWT)		\$.46	-\$0.46
Revenue from \$60 per hundred carcass weight**	\$120.56	\$122.41	-\$1.85
Net revenue per hog marketed	\$10.41	\$19.66	-\$9.26

\* Uses Plant Sale Weight

\*\* Confinement revenue includes the \$.46/CWT Premium as well as the yield premium.

