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Chris Hillburn  
Iowa State University

James Kliebenstein  
Iowa State University

Emmett Stevermer  
Iowa State University

Larry Trede  
Iowa State University

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Abstract
There has been much discussion recently about changes occurring in the swine industry. The purpose of this study is to assess the competitive position of Iowa pork producers. A comparison of swine production efficiencies between Iowa producers and the competition is presented. In this report the competition is the highly intensified swine production systems.

Disciplines
Agribusiness | Agriculture Law | Economic History | Industrial Organization

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A Comparison of Iowa Swine Production with Its Competition

by

Chris Hillburn
James Kliebenstein
Emmett Stevermer
Larry Trede

Staff Paper No. 184

Research assistant, Department of Economics, Iowa State University; Associate Professor, Department of Economics, Iowa State University; Professor, Animal Science, Iowa State University; Associate Professor, Agricultural Education, Iowa State University.
There has been much discussion recently about changes occurring in the swine industry. The purpose of this study is to assess the competitive position of Iowa pork producers. A comparison of swine production efficiencies between Iowa producers and the competition is presented. In this report the competition is the highly intensified swine production systems.

Pork production, like most other agricultural enterprises, has traditionally and historically been a fragmented industry. This is where large numbers of small and medium-sized producers exist, none having a significant market share nor the power to shape industry events. However, pork production is currently undergoing changes that may have major structural implications. The demographics of the pork industry indicate the number of hog operations in the United States declined by 56 percent, from 871,000 to 396,000, during the 1970 to 1985 period. In Iowa the number of hog operations declined from 91,000 to 43,000, down 53 percent.

Despite the decrease in the number of hog operations, production of hogs and pork has not declined. Hogs per farm increased from an average of 77 to 132 head in the United States and from 177 to 314 head in Iowa during the 1970-1985 period.

In addition to the demographic changes noted above, the nature of pork production has also changed, at least for some producers. These changes have occurred through technological improvements such as environmentally controlled confinement production facilities, improved breeds that produce leaner hogs, and improvements in nutrition and medicine.

Do these technological advances imply other structural changes in pork production? It is quite probable that they could, as strong parallels exist
in other agricultural enterprise, notably in broilers and cattle feeding. Both of these sectors underwent major technological advancements. There were also substantial shifts in the regional distribution of broilers and cattle feeding. For example, in the 1960s cattle feeding shifted from the Corn Belt and Northern Plains to the Southern Plains. Cattle feeding changed from an industry where the dominant producer was a small (less than 1,000-head capacity) farmer-feeder in the Corn Belt to one where large commercial feedlots in the Southern Plains and Western States dominated. It should be noted that this rapid growth of cattle feeding in the Southern Plains was also accompanied by a rapid growth of feed-production in the region.

Pork production too has undergone major technological change, but the Corn-Belt (and Iowa) still dominate pork production. However, major changes in pork production have occurred largely outside this traditional hog producing region. Relatively large, specialized operations with large investments in technology and facilities have been established outside the Corn Belt.

To assess the implications of these changes in pork production for Iowa producers, it is useful to characterize the "competition" as far as possible in terms of facilities, management, labor, overall performance, etc. This characterization may well describe some Iowa pork producers also.

Facilities are typically large and technologically advanced. Confinement facilities dominate, but owing to differences in climate, land costs, and manure handling costs, these confinement facilities are not directly comparable to confinement facilities in Iowa. None the less, production costs can be comparable as they compete in the swine production industry in a one enterprise.
These operations are characterized by specialized management. Labor is hired and trained to the specific tasks of pork production. Productivity figures shown in Table 1 indicate that while pork production is not a major industry in the region it does not detract from labor efficiency.

The latest technology is involved in the mechanized handling of feed, water, wastes and ventilation. This means that fixed assets have grown in importance and to a large degree, these fixed assets have substituted for labor. There is also a trend for these producers to become specialized in swine production, i.e. one producer specializes in furnishing feeder pigs while another producer specializes only in the gestation, farrowing, nursery phase of swine production.

Comparisons of Iowa pork producers and competitors for the period 1983-1986 are provided in Table 1. Iowa producers are divided into the top 1/3 and low 1/3 return groups. The Iowa groups are similar in size, while the competition averages 5,000 head marketed per year, more than three times the size of the Iowa average. The competition had an advantage in total cost per cwt. of pork produced of $4.77 over the Iowa top 1/3 group and an advantage of almost $15 over the Iowa low 1/3 group.

Breaking down total costs into its components, competitors had a feed cost per cwt. of pork produced advantage of $3.23 over the Iowa top 1/3 group. This accounted for 68 percent of the total cost difference of $4.77 between these two groups. When compared to the Iowa low 1/3 group there is a feed cost difference per cwt. of pork produced of $7.74, accounting for 52 percent of the total cost difference. It should be noted that these cost figures are based on an average corn price of $2.50 per bushel. This standardization
procedure slightly overstates feed cost for Iowa producers relative to the competition as the ration cost was higher for the competition as will be seen below. In the current market with lower corn prices the cost differences would be less.

The competition used 32 less pounds of feed to produce 100 pounds of gain than did the high Iowa one-third group. The competition also had an advantage of three more pigs/sow/year over the top Iowa one-third group and an advantage of more than four pigs/sow/year over the low one-third group.

The competition's fixed costs were lower than either of the Iowa groups, with a cost advantage of $1.27 per cwt. of pork produced over the top Iowa one-third and $4.26 advantage over the low Iowa one-third. Since the competition is characterized by large investments in fixed facilities, it appears that this higher capital investment has improved efficiency enough to offset increased production costs. However, owing to differences in facilities, climate, land costs, and manure handling costs, this conclusion needs further study.

The information presented above indicates that Iowa producers face competition from the relatively large producers operating in regions where little feed is produced and where pork production has not been a major enterprise. These competitors have utilized advanced facilities, technology, and specialized management and labor to gain production cost and efficiencies.

To further assess the competitive position of Iowa producers, the Iowa State Swine Records for 1986 were sorted into the top 10 percent and 20 percent of producers by profit per cwt pork produced. Table 2 provides information on these two groups as well as the competition for 1986.
This information shows that the top 20 percent of Iowa producers are highly competitive. The Iowa top 20 percent and the competition have similar feed costs ($19.41 vs. $20.11) per cwt. of pork produced. The advantage is tipped to the top Iowa managers when slaughter hog market weight is considered. Iowa producers were selling a 240 pound hog while the average marketing weight for the competition was 225 pounds. Total cost of production actually favors the top Iowa managers, even though the competition is superior in pigs/sow/year (14.42 vs. 18.5), feed efficiency (3.63 vs. 3.40) and death loss (14.95% vs. 10%). The competition has a higher diet cost/cwt. ($5.38 vs. $6.01) and higher fixed costs. While fixed costs were not available singularly for 1986 for the competition, information from Table 1 would indicate that these are likely in the $5.00 range. This is $1.00 to $1.50 higher than for the top Iowa producers.

The best Iowa producers were competitive with 4.58 fewer pigs per sow per year and .42 fewer litters per sow per year. The competitive picture would change dramatically through production strategies which increase these production levels.

The top Iowa producers weaned 8.10 pigs per litter while the competition weaned 8.8 pigs. The competition produced 2.1 litters per sow per year while the top Iowa producer reached 1.78 litters per sow. Again, a rather dramatic difference.

The information presented indicates that the best Iowa managers are competitive. The drawback to this is that it only represents 20 percent of the producers. The industry needs to be setting the sights where, at a minimum, the average Iowa producer has production efficiencies similar to the competition.
Net profit data were not available for the competition. However, based on the assumption of a $51.80 per cwt. hog price, average size of operation (1,260 hogs marketed), and 1986 production costs ($30.78) the net profit for the Iowa top 20 percent would be approximately $60,915 per producer. For the competition, based on the same hog price, their production costs ($32.50) and average size (5,000 hogs), net profit would be $216,200 per producer. Of course this relationship would reverse itself during loss years if it is assumed that market price is not impacted by value sales.

This profit comparison breaks down into a net margin per cwt of pork produced of $21.02 for the Iowa top 20 percent versus the competition's net margin per cwt of $19.30. These figures suggest a relatively flat average cost curve, implying that producers on the scale of the Iowa top 20 percent are competitive in terms of cost of production with large producers. However, given the larger size (5,000 head) of the competition total profit would be much larger. However, this remains subjective since returns data on the competition are not available. Also, Iowa producers may have profit being generated from other farm enterprises as well. This would not be the case for the competition.

It is clear that the top 20 percent of Iowa producers are in a reasonably strong competitive position. The data indicate further that it is not necessarily size that provides the competitive advantage, but rather production efficiency. This implies that management intensity is the key to remaining competitive in pork production. Simply being larger is not necessarily better, since top managers with smaller operations are competitive in terms of costs with operations three times their average size. Simply becoming larger
will not solve production efficiency problems for producers with low production efficiencies.

Previous studies have indicated the existence of economies of size. For example, one study indicated that 35 percent of the feed cost advantage of larger producers (5,000 or larger) was due to lower input purchase price (i.e. discounts on bulk purchases). But, this study also indicated that 65 percent of the feed cost advantage of large producers was due to superior efficiency. This would indicate that economies of size in hog production are primarily management driven, not size driven.

There appears to be little reason to feel that pork production will shift in mass to larger operations and regions outside the midwest. However, the fact that the competition has been able to offset the regional advantages of Iowa producers indicates that the intrinsic advantage of pork production in the Corn-Belt region can, to some degree, be offset by advanced technology, management expertise, and, to some extent, size of operation.

While the top Iowa producers are in a strong competitive position much work remains to be done. This is clearly indicated by the overall cost advantage of the competition compared to the Iowa average, low one third group, and even the top one third group. Only Iowa's top 20 to 25 percent are in this strong competitive position. Methods need to be established to aid development and expansion of management intensity. Iowa's producers cannot hope to single handedly develop this management intensity. Iowa's typical swine farm is diversified as contrasted with the competition. This diversification can cause problems with intensive management of each enterprise. Diversification can be advantageous too during time of profit swings between enterprises.
The bottom line is that smaller operations in the Midwest can be competitive and can survive. The key to their success and survival is not new - it is management. As before, the top notch managers will survive.

Facilities and technology also will play a major role in survival and competitiveness. While interregional differences and lack of data prevent any specific conclusions in this area. It does appear that the competition has been able to offset the higher costs of production associated with higher investment in fixed assets through improved efficiency. This points out a common sense guideline for swine producers. That is the main issue for survival is to improve efficiency first, through technology and management, and then, perhaps, grow in size. Expansion will not solve production efficiency problems.

Iowa pork producers can fully utilize their intrinsic advantages and achieve the same types of results as the competition or even improve upon these results. If the competition has achieved overall cost leadership through efficiency, Iowa producers who respond to this competition will be able to do as well or even better. This represents the most effective response Iowa producers can make to this competition.
Table 1. Comparison of Iowa Producers with Competition (1983-1986)

<table>
<thead>
<tr>
<th></th>
<th>Iowa Top 1/3</th>
<th>Iowa Low 1/3</th>
<th>Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed cost/cwt*</td>
<td>23.76</td>
<td>28.27</td>
<td>20.53</td>
</tr>
<tr>
<td>Fixed cost/cwt</td>
<td>6.77</td>
<td>9.76</td>
<td>5.50</td>
</tr>
<tr>
<td>Total cost/cwt</td>
<td>38.20</td>
<td>48.40</td>
<td>33.43</td>
</tr>
<tr>
<td>Pigs/sow/yr</td>
<td>15.01</td>
<td>13.72</td>
<td>18</td>
</tr>
<tr>
<td>Feed efficiency</td>
<td>3.72</td>
<td>4.09</td>
<td>3.4</td>
</tr>
<tr>
<td>Avg. Hd. Mkt./Yr.</td>
<td>1422</td>
<td>1171</td>
<td>5000</td>
</tr>
</tbody>
</table>

*Assumes an average corn price of $2.50/bushel.
Table 2. Comparison of Iowa Top 10 and 20 Percent with Competition (1986) (Farrow to Finish)

<table>
<thead>
<tr>
<th></th>
<th>Iowa Top 10%</th>
<th>Iowa Top 20%</th>
<th>Iowa Average</th>
<th>Competition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed cost/cwt</td>
<td>18.77</td>
<td>19.41</td>
<td>22.56</td>
<td>20.11</td>
</tr>
<tr>
<td>Fixed cost/cwt</td>
<td>4.05</td>
<td>4.23</td>
<td>6.53</td>
<td>N/A</td>
</tr>
<tr>
<td>Total cost/cwt</td>
<td>29.30</td>
<td>30.78</td>
<td>38.02</td>
<td>32.50</td>
</tr>
<tr>
<td>Pigs/sow/yr</td>
<td>13.95</td>
<td>14.42</td>
<td>14.12</td>
<td>18.50</td>
</tr>
<tr>
<td>Feed efficiency</td>
<td>3.61</td>
<td>3.63</td>
<td>4.05</td>
<td>3.4</td>
</tr>
<tr>
<td>Avg. Hd. Mkt./Yr.</td>
<td>1036</td>
<td>1260</td>
<td>1249</td>
<td>5000</td>
</tr>
<tr>
<td>Pigs weaned/litter</td>
<td>7.93</td>
<td>8.10</td>
<td>7.98</td>
<td>8.8</td>
</tr>
<tr>
<td>Litters/sow/yr</td>
<td>1.76</td>
<td>1.78</td>
<td>1.77</td>
<td>2.1</td>
</tr>
<tr>
<td>Death loss</td>
<td>15.02</td>
<td>14.95</td>
<td>16.10</td>
<td>10</td>
</tr>
<tr>
<td>Diet cost/cwt</td>
<td>5.22</td>
<td>5.38</td>
<td>5.80</td>
<td>6.01</td>
</tr>
</tbody>
</table>