The U.S. Pork Industry In Transition

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Abstract
The swine industry continues to change, but the rate of change appears to be increasing. The number of farms with hogs declined dramatically in the last twenty years. Nationally, in 1991, there are only 30% as many farms with hogs that existed in 1970 (Figure 1). Midwestern states, and Iowa in particular, fared better than the national total, losing "only" 60 percent of the hog farms. While farm numbers decline, the number of hogs produced in the U.S. remains relatively stable. As a result, the average number of hogs per farm has doubled nationally in Iowa and most other Midwest states. In contrast, North Carolina has had an eight-fold increase in the average number of hogs per farm in 20 years.

Disciplines
Agribusiness | Behavioral Economics | Food Security
THE U.S. PORK INDUSTRY IN TRANSITION

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Staff Paper No. 240
May 1992

The author wishes to thank Drs. Roger Ginder, Marvin Hayenga, and James Kliebenstein for their comments.
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The swine industry continues to change, but the rate of change appears to be increasing. The number of farms with hogs declined dramatically in the last twenty years. Nationally, in 1991, there are only 30% as many farms with hogs that existed in 1970 (Figure 1). Midwestern states, and Iowa in particular, fared better than the national total, losing "only" 60 percent of the hog farms. While farm numbers decline, the number of hogs produced in the U.S. remains relatively stable. As a result, the average number of hogs per farm has doubled nationally in Iowa and most other Midwest states. In contrast, North Carolina has had an eight-fold increase in the average number of hogs per farm in 20 years.

However, average farm size does not capture the whole story. In 1991, nearly 90 percent of U.S. farms have less than 500 head inventory. Yet these small farms account for only 32 percent of the nation's hogs (Figure 2). Conversely, farms over 1000 head inventory represent over 44 percent of the nation's production and less than 5 percent of the farms.
The 1987 Census of Agriculture data provide an additional and more complete breakdown by farm marketing volume. The percentage of hogs raised on farms marketing less than 1000 head per year has been decreasing since 1978 (Table 1). While still over 40 percent of the total in 1987, their share of total marketings had declined from over 60 percent just ten years earlier. The share accounted for by the 1000 to 2000 head size category stabilized between 1982 and 1987 after gaining in the previous years. The largest volume categories, 2000 to 5000 and over 5000 head are still growing.

Table 1. Hog Marketings by Volume Class, Census of Agriculture, 1978, 1982, & 1987

<table>
<thead>
<tr>
<th>Annual Marketings</th>
<th>Percent of Total Farms</th>
<th>Percent of Total Marketings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1,000 head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>96.8</td>
<td>66.4</td>
</tr>
<tr>
<td>1982</td>
<td>93.1</td>
<td>51.9</td>
</tr>
<tr>
<td>1987</td>
<td>89.9</td>
<td>42.5</td>
</tr>
<tr>
<td>1,000 to 1,999 head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>2.4</td>
<td>16.3</td>
</tr>
<tr>
<td>1982</td>
<td>4.8</td>
<td>21.1</td>
</tr>
<tr>
<td>1987</td>
<td>6.7</td>
<td>21.9</td>
</tr>
<tr>
<td>2,000 to 4,000 head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>0.7</td>
<td>10.3</td>
</tr>
<tr>
<td>1982</td>
<td>1.7</td>
<td>15.2</td>
</tr>
<tr>
<td>1987</td>
<td>2.7</td>
<td>18.5</td>
</tr>
<tr>
<td>5,000 head and more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>0.1</td>
<td>7.0</td>
</tr>
<tr>
<td>1982</td>
<td>0.4</td>
<td>11.8</td>
</tr>
<tr>
<td>1987</td>
<td>0.7</td>
<td>17.1</td>
</tr>
</tbody>
</table>
If current trends continue, the 1992 Census of Ag data will show continued growth from farms over 5000 head, a decline in the under 2000 head farms and stabilization in the 2000 to 5000 head category. The over 5000 head category will likely account for 25 percent of all the hogs marketed in the U.S.

Changes in the Marketing Channel

Although the trends to fewer and larger farms can be documented, a more important question is "Why are these changes occurring?" First, consider the key variables that supported a system of many independent farmers producing and marketing hogs and how this system has changed.

The traditional marketing channel is depicted in Figure 3. The production level is vertically integrated. Farmers who finish hogs also farrowed them, raised replacement gilts, and raise corn. Then there is a distinct break between production and the packing, processing, wholesale distribution and retailing segments. These different segments, as drawn, are divided by solid lines depicting little communication between segments. Traditionally the industry has relied on price signals sent from consumers through retailers, wholesalers, and packers to the producer on what needed to be produced for the market. The distinct break between producers and packers bridged only by market signals caused producers and packers to take on adversarial roles. Not only were
they not communicating, but they were pointing fingers, one blaming the other
for the problems within the industry. However, this structure of the
marketing channel is changing and will continue to change. Ginder lists six
key factors that supported the producer-centered marketing system\(^1\). These
foundation variables are beginning to crumble or change as we move to a new
type of pork industry.

First, independent producers were able to finance hog production. Hogs
had always been known as the mortgage lifters; bankers were anxious to loan
money on hogs as a way to improve cash flows, better utilize labor on many
farms, and to market homegrown grain. However, as modern pork production
becomes more capital intensive, fewer bankers are interested in loaning money
for highly capitalized swine production. Agricultural lenders, stressed by
the farm financial crisis of the mid-1980s, are less willing to take risk.
They are beginning to demand complete business plans outlining and justifying
swine investments in farming operations. The ability for many independent
farmers to obtain traditional financing for modern pork production has
diminished.

Second, the independent farmer has historically been the low cost
producer of pork. No one was able or willing to produce pork cheaper than the
independent farmer. However, this too has changed. Large, specialized hog
production operations have utilized improved genetics, nutrition, management
and economies of size to compete with the best independent producers. Thus,

\(^1\)Ginder, Roger G. "Changing Structure of the Pork Industry" Staff Paper
Series 1989, Dept. of Econ., Iowa State University
the cost advantage of independent, diversified farms which are not rapidly adopting modern technology is being threatened by more efficient units.

Third, independent producers have been able to sell in any market without substantial discounts. Packers are becoming more particular about the quality and consistency of the hogs they buy. Nearly all major packers have and are using some type of carcass merit pricing to buy hogs. It is common for packers to pay a handsome premium for large lots of hogs with consistently high carcass value. Recently, during the time of large hog supplies, a few packers have sent letters to producers of low quality hogs saying, "Please sell your hogs to our competition." Clearly, packers know who has quality hogs and who doesn't, and they are doing something about it. If this trend continues, the market for low quality hogs will disappear. Independent producers that do not improve the quality of their hogs at the least will be heavily discounted and, at the extreme, may not have a place to sell their product, even if they are low cost producers.

Fourth, access to technology has also been a critical component of independent producers' advancements. Traditionally, land grant universities and public institutions have provided the research and extension service to develop and transfer this technology quickly and at low cost to the independent producer. Budget limitations at public institutions have constrained research funds and forced researchers to search for other funding from commodity organizations and private firms. Secondly, extension services throughout the nation are facing budget constraints that have hampered their ability to deliver technology. At the same time, private firms are beginning
to do their own proprietary research on genetics, nutrition and herd health. This information will be released only to those producers who are producing hogs for that firm or are willing to buy the technology. Particularly important is access to genetics as packers demand consistent quality hogs that may only be available through one of these firms. Without access to emerging technology, independent producers could be at a distinct disadvantage in cost of production and marketing ability.

The fifth key factor is free access to information which is also being threatened. Due to budget cuts, many states have dropped their market reporting services. As we move to more component pricing or carcass merit pricing of hogs, simply getting the average price for barrows and gilts in the Iowa market may not be sufficient to make informed marketing decisions. Forward pricing or production contract terms may be important market information if these markets become an important part of the market system. Furthermore, if this information is not provided by unbiased government agencies, producers will have to collect the information themselves, adding to their cost. It may be a greater issue if this information is considered proprietary and not public.

Finally, consumers are changing. Traditionally, they have been willing to accept whatever was put before them. Today, consumers are more diverse and are demanding that their needs be addressed. Simply putting pork chops and bacon in the counter is not going to be enough to satisfy the modern consumer. Today's consumer wants consistent, quality products that provide attributes such as convenience, microwaveable, biodegradable packaging, good tasting,
low-fat, low-salt, nutritious, and wholesome. It should taste like Mexican food one night and Chinese food the next. They don't particularly care whether the product comes from pork, beef, poultry, or vegetables. Therefore, it's necessary that the pork industry deliver this type of a product. That will mean more control over the way the product is produced and processed, and it may require improved coordination of the system all the way from conception to consumer.

In addition to the shifting foundation that supported a producer-centered marketing channel, the drive to efficiently produce protein is also causing changes in the structure of the pork industry. It is important to recognize that producers and processors are not in the pork industry, but rather in the protein industry. They face stiff competition from other sectors, in particular the poultry industry. Both broilers and turkeys have wrung inefficiency out of their system by moving to a totally vertically integrated system in which the signals are sent directly between segments rather than relying on the market signals. The different segments within the industry communicate and cooperate because they're owned by a single firm.

Pork packers and processors are facing this type of competition at the retail counter. They can gain efficiency by using direct signals to run their plants at the appropriate rates. In particular, packers would like to have more control over what is being delivered (a high quality and consistent supply of hogs) as well as when delivery occurs to run plants at peak efficiency. A plant that starts killing in the morning and runs out of hogs by midday may have to pay labor for the full day. Likewise, an extremely
large supply of hogs one day will require overtime pay. This mismatch with capacity causes inefficiency and higher cost production. One packer involved in the pork, beef, and poultry industries recently said, "I can tell you six months from now on a given day how many turkeys I will process. I don't have the slightest idea how many hogs I will process tomorrow." Thus, packers are interested in coordinating the flow of animals to increase plant efficiency.

Another factor driving the change is production efficiency. Pork producers are more efficient than ever before. In the last twenty years, annual commercial pork produced per animal in the breeding herd has increased over 50 percent. That is a larger increase in efficiency than corn yields, soybean yields, milk production, or any other major commodity. While the average efficiency of swine producers has increased dramatically, there is still a great deal of variation within the industry. Table 2 shows a summary of 1991 Iowa State University Swine Enterprise Records. These farms represent a sample of commercial independent farms within the state of Iowa producing approximately 1500 head of market hogs a year. Many of the numbers are quite impressive. However, note the difference in the cost of producing 100 pounds of pork. There is $11.30 difference in the cost of production between the high profit one-third and the low profit one-third of producers. This sends up a flare to the rest of the world saying "profits can be made in the pork industry." In fact, firms entering the pork industry are competitive and are exploiting the variation in the industry. As these new large-scale producers enter the industry, the number of hogs being produced increases, the margins in the pork industry narrow, and high cost producers will find someplace else to use their resources.
### Table 2. 1991 Iowa State University Enterprise Summary

**Farrow to Finish Enterprises: Selected Items**

<table>
<thead>
<tr>
<th></th>
<th>High Profit 118 Farms</th>
<th>Average 353 Farms</th>
<th>Low Profit 118 Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female inventory</td>
<td>113</td>
<td>112</td>
<td>110</td>
</tr>
<tr>
<td>Market hogs sold</td>
<td>1563</td>
<td>1426</td>
<td>1232</td>
</tr>
<tr>
<td>Pigs / female / year</td>
<td>15.89</td>
<td>15.19</td>
<td>14.20</td>
</tr>
<tr>
<td>Feed / Cwt of pork</td>
<td>352</td>
<td>374</td>
<td>399</td>
</tr>
<tr>
<td>Average selling price</td>
<td>$49.83</td>
<td>$49.05</td>
<td>$48.55</td>
</tr>
<tr>
<td>Total cost / Cwt</td>
<td>35.49</td>
<td>40.77</td>
<td>46.79</td>
</tr>
<tr>
<td>Return / Cwt</td>
<td>14.35</td>
<td>8.28</td>
<td>1.76</td>
</tr>
</tbody>
</table>

The changes described have changed the way the marketing channel looks. Figure 4 has the same participants and is still a vertical system running from the feed and genetics to the consumer. However, rather than separate entities divided by solid lines and linked loosely through markets, participants are divided by a dashed line which allows for a flow of information from one participant to the next. Open lines of communication send direct signals to the participants in the marketing channel. This new channel can come about in one of two ways. One is integration in which one participant in the channel owns two or more segments of the channel as in the poultry industry. Second, it can come about by communication and cooperation between the participants in the industry, either informally or formally via contract linkages. Independent farmers can still exist in this system if they are willing to communicate and cooperate to deliver what the consumer demands. This change requires working more closely with packers and processors to make
the entire system more efficient, rather than each party blaming the other for pork industry problems.

The pork industry, as a whole, needs to become more efficient to compete effectively in the protein market. Producers can be extremely efficient, but if the packers, processors, or retailers are not, all the consumer is going to see is a high-priced product. The consumers do not care who is inefficient; they don't care why there is inefficiency. They will just look for a low cost protein that meets their needs.

New Allegiances

Taking the coordinated marketing channel as a model for the future, the question becomes, "How can a pork producer be part of this new industry?" The necessary coordination can occur in one of two ways, integration or communication and cooperation.

Many local feed companies, with support from corporate headquarters, have linked genetics, feed, and farmers to farrow and finish hogs under contract and negotiated prices with packers. They have integrated from feed and genetics up to the packer, and have coordinated with the packer by communication or contract. A few packers have also coordinated genetics and feed and arranged for producers to farrow and finish hogs for them. These packers have or will put a branded product in the market case. The needed quality control is available via ownership and contracting. Retailers are also interested in coordinating the system by working through a packer to identify and secure a large quantity of high quality hogs.
There are also examples of hog farmers working toward vertical integration. They raise seedstock, produce feed, farrow and finish hogs, and link with a packer through a long-term marketing agreement. In fact, one farmer is attempting to buy a portion of the packer to be able to profit from his hogs all the way to the retail counter.

Coordination is also being organized by those who serve the industry, such as feed companies, veterinarians, and farm managers. Consultants serving a farrowing operation that provide genetic, health, and nutritional services may also help identify contract growers. Furthermore, these consultants represent the farrowing operation to the packer by selling a specific set of genetics, grown to specification, and delivered on a set schedule to meet the packer's needs. Typically, these consultants do not own facilities or hogs. Obviously, there is enough slack in the existing production sector to make a competitive profit at each level and extract a toll for their services.

Farmer-owned cooperatives are also attempting to coordinate the system through their members. One cooperative already has a meat division with processing and branded products in the stores. This starting point may give them an advantage over other coordinators who do not currently have a known label at the retail end. Thus, integration or coordination can be initiated by any sector of the pork industry. It is not reserved for packers or feed companies or only the very large corporate businesses.

The trend to increased coordination in the swine industry will likely continue. Economics and the search for profits in this competitive industry
has motivated the drive to improve coordination. Coordinators have seen the opportunity for profits by linking different sectors together. They are taking advantage of a technological or management niche to extract more profit from the existing system. Unless improved products lead to increased demand, price levels will decline and profit margins for the existing producers will narrow in the future.

Do producers have to be integrated or produce under contract for an integrated firm to be in the hog business of the future? Not necessarily. Obviously, one way to be in the hog industry is to sell your management expertise, labor, and facilities to someone else via production contracts. Many producers see this as a viable option because it provides a steady flow of income, reduces exposure to market risk, and allows access to the latest technology. Contract production may also increase the ability to secure financing for new hog facilities as well as provide a low risk asset in the farmer's portfolio. However, there will be opportunities for independent hog producers that adapt to the changes. Those who continue to produce as they always have will fall further behind, as technology changes at an increasing rate. Farmers who can compete on cost of production and product quality will not be at a disadvantage until integrated operations provide a much larger share of total pork production. At that time independents may be in the role of residual supplier. Producers that are willing to adapt to the changes can survive. However, they will have to form new allegiances that some may view as a threat to their independence today, but that may be the salvation of it in the future.
Requirements for Success

There are several requirements for successful swine producers in the future, all focused on being a low-cost, high quality producer. First is access and the quick adoption of the technology as it becomes available. Access to technology will become a more critical issue in the future. Firms that have exclusive rights to, or more quickly adopt, technology that greatly enhances their production or marketing ability, will have a competitive advantage in the industry.

Access to information is equally important: up to the minute information about prices that individual packers are paying for a particular type of hogs, changes that packers are making in the type of hogs they need, contracts that are available, trade and policy decisions that impact markets, and environmental restrictions that impact production will all be necessary.

There will be increased specialization. This has been the general trend in agriculture for quite some time. The days of being a "jack-of-all-trades and master-of-none" are gone. The cost of being more specialized in, say a cropping operation, may mean being less competitive in a hog operation. To be competitive in the new hog industry will mean that someone in the operation has to stay abreast of the latest technologies and quickly adopt the best ones. The good news is that another strong trend in agriculture supports increased specialization, a move to more multi-family farm units. These farm businesses allow individuals to specialize in different enterprises to reap the advantages of specialization while still enjoying the benefits of
diversification. For example, have row crops, a hog operation, and cattle feeding all managed by specialists.

Also consistent with the trend of increased specialization is the increased use of consultants. Farmers can be experts in managing their farm businesses, but may not be an expert in the latest herd health and nutritional issues, or latest marketing methods. Thus, they must hire the needed services just as they hire a mechanic or a tax accountant.

How can the independent producer ensure himself access to technology, markets, and information? One way is to stay abreast of these changes himself. Another way is to cooperate and communicate with other producers within the sector as discussed earlier. One example might be through farmer cooperatives in which the cooperative is large enough to capture economies of size. Such size allows the coop to buy or develop the technology and make it available to the producers; large enough to bargain from a strong position with packers; and large enough to provide the consulting services its members needed to be competitive in the industry. Existing cooperatives may capture the beneficial economies of size, but may have conflicting objectives beyond that due to its diverse membership.

Another way to access technology is for a group of producers to form a new closed cooperative or partnership. One example is a group of producers that jointly produces seedstock. They built a multiplier herd that supplies members with state-of-the-art genetics at a reduced cost by signing a licensing agreement with a seedstock company. Each member has his or her own
farm that ranges in size from 80-400 sows. The result is a group of independent farmers, each producing hogs in his or her own facilities with a common genetic base, nutrition, and herd health, which now represents a very large number of uniform high-quality hogs. They can then talk to the packers from a strong bargaining position. Although it's a small group of like-minded individuals, they are large enough to secure access to technology, jointly hire a consultant for herd health, nutrition, and to market their hogs to packers. Members have common objectives and directly reap all benefits from the cooperation and communication that help make them all more successful. It also allows each individual to remain independent, and to raise hogs in his or her existing facilities.

Are There Alternatives?

Hog production will be quite different in the future. However, there is no reason independent producers cannot be a part of it as long as they're willing to adapt to the changing environment, use new technology as it becomes available, and communicate and cooperate with other producers and other sectors within the industry. There are some producers and policy-makers, however, that view the changes as detrimental to agriculture and rural communities. What are some of the pros and cons of preventing these changes from occurring?

There are two basic policy tools that can affect this change. One is policies that attempt to limit the size of hog operations or limit ownership or contracting arrangements. The second type of policy is one that enhances
production by independent producers. Policies that attempt to limit or prevent something from happening are often difficult to enforce and do not have a good track record of providing the desired results. Oftentimes, these policies become outdated and may come back to limit the competitiveness of the independent producers that they were put in place to help. In addition, many of our largest hog producers in the U.S. are successful family farms or family held corporations.

Finally, we must be cautious of policies affecting an individual state without getting cooperation from other states as well. For example, should one Midwestern state pass a law limiting how large hog farms can be or put a tax on manure produced to discourage large units, large hog operations will simply move to another state. While the policy may satisfy a local social agenda, if the trend in the industry is truly to larger operations, you have also limited the ability of the industry within that state to compete. Packing plants tend to operate where hogs are produced. A region may not be able to maintain a packing plant to insure access to markets without sufficient hogs. Policies that limit growth of operations to a position where they are no longer competitive may not be able to support veterinarians, feed companies, or consultants in a given region to serve smaller producers as well. So, there can be unexpected side effects of a given growth-limiting policy.

The second type of policy - one that enhances production by independent producers - may have some potential if implemented on a national basis. A policy that enhances research at land grant institutions and supports
extension services that transfer technology to independent producers will improve access to technology and information. These policies may act as subsidized consulting should the services be provided at a level which would allow more individual attention to the independent producers. However, this can be a very costly policy in a time of tight federal and state budgets.

Another policy may be to adopt changes in the marketing system. Access to markets is becoming a very critical issue for independent producers. Many feel they can be competitive on a cost production basis, but do not have the large number of consistent hogs that are receiving premiums from packers. Marketing laws that assure equal access to markets regardless of volume would help the independent producer in a competitive environment. One word of caution! If packers are paying the premium for large lots of high-quality hogs because it makes them more profit and they pay higher prices to get them, then restrictions on such practices also restrict the efficiency of the industry and the ability of pork to compete at the retail marketplace with poultry and other foods. Thus, any policy assuring equal access to markets must do so efficiently if the pork industry is to stay competitive.

The pork industry has always been dynamic and changing, but the rate of change seems to be increasing at an increasing rate. Pork producers who want to remain competitive are faced with a set of challenges they have not seen before. They have to continue to adopt new technology, but may find access to it increasingly limited. Additionally, access to information and access to markets will become increasingly important, particularly for those producers who fail to adopt the genetics and marketing practices that the packers and
ultimately consumers are demanding. The drive to be a low-cost, high quality producer continues, but it has never been more important. Producers must continue to adapt to these changes, but it's going to mean doing business as they haven't in the past. It may also require forming alliances with other producers and other sectors of the marketing channel. These alliances can provide the necessary cooperation and communication required to be a pork producer in the years ahead.