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Industrialization in the Pork Industry

During the 1950s as the poultry industry made its dramatic structural movement toward vertical integration, economists declared, "the pork industry will follow suit." But the pork industry did not follow—at least for forty years. Today however, participants in the pork industry seem surprised by the resurgence of structural adjustment, and the implications for participants in this industry are of enormous importance.

The pork industry is a huge sector within the agricultural economy. Retail sales total about \$27 billion dollars per year of which about \$16 billion flows to the marketing segment and \$11 billion to 236,000 domestic hog producers. Traditionally this industry has been centered in the Hog-Corn Belt which spans the Midwest, and that tradition continues. The twelve North Central states, from Ohio and Michigan on the east to the Dakotas, Nebraska and Kansas on the west, accounted for 78 percent of the hogs marketed in 1993.

But geographic change is also afoot. The Hog-Corn Belt has lost 4 percent of U.S. market share since 1985, with the losses concentrated in the major hog states of Iowa, Illinois, Indiana, Ohio, Wisconsin, and Missouri.

Why industrialization? Why now?

Historical data clearly shows that the trend toward larger more specialized hog production and pork processing operations has been ongoing for sixty years or more, but the rate seems to have accelerated in recent years. In 1980, 670,000 farms produced hogs. Only 236,000 such farms remain. Just think—that's a 65 percent out-migration in a fourteen-year period.

Who is leaving the industry? It's the small farms. Of the 434,000 farms that have left the industry

since 1980, most (85 percent) had less than 100 hogs in inventory. The remainder were under 500 head of inventory. Here are some factors driving this change.

- The pork industry is a high-margin business. Farms on the Iowa State University records program achieved in excess of a 25 percent annual average rate of return on capital in hogs since 1980. High returns have attracted outside investors.
- There remains a wide variation in costs among producers, and some know how to consistently operate at low costs. The Iowa records data show a \$28 per hog spread in costs between the highest one-third and the lowest one-third of producers.
- The industry is now highly technical and technologically dynamic. New technologies have names like All-In/All-Out; Multiple-Site Rearing;

by Chris Hurt



A tour of operations is conducted at Live Oak Farms.



Smithfield Food's new plant in Tar Heel, North Carolina, currently the largest plant in the world.

Modified Medicated Early Weaning; Split-Sex Feeding; Pelleted Hi-Density Phase Feeding; and Artificial Insemination. These technologies are health enhancing, cost lowering, and risk reducing, allowing greater and greater concentrations of animals.

- The last major investment surge in hog production was in the late 1970s. Therefore, much of the physical and human capital in the Midwest is now of a different era and subject to technological obsolescence.
- Much of the new technology cannot be fully implemented using the existing physical and human resources in traditional hog areas.
- Major economies of scale exist in hog production, and the industry is still far from exploiting these known economies.

Of the 434,000 farms that have left the industry since 1980, most (85 percent) had less than 100 hogs in inventory.

- While most of the economic inefficiency in the industry is likely to be in the hog production sector, additional economic benefits can be gained from improved coordination of a stable supply of consistent quality hogs through processing, and by better matching pork production to consumer desires.
- Many in the industry believe that domestic and

foreign consumers will demand more highly differentiated pork products in the future, perhaps requiring coordinating mechanisms other than spot markets and including contracting and vertical coordination.

If this model were to become the norm, today's pork volume could be supplied by twelve plants and about fifty producers.

Traits of pork industrialization

You can recognize industrialization in the pork sector by megahog operations, rapid growth of contract production, movement toward vertical coordination of production and processing, and an inflow of capital from investors with a vision of building a more highly coordinated pork system. This ideal system would be more consumer responsive and deliver superior economic performance relative to the market-coordinated system in the Midwest.

The industry in North Carolina has led the trend toward pork industrialization. Drawing heavily from principles observed in the state's integrated poultry industry, they have surged to become the second-leading pork producing state.

North Carolina has built the largest pork processing plant in the world. This new plant will process over 8 percent of all the hogs in the coun-

try. It is twice the size of any midwestern plant. The supply for the plant will be coordinated with a tiny handful of megaproducers. With this tightly coordinated system, they will be able to supply meat retailers and consumers with the most consistent quality available today, and do so in large volumes. In addition, since coordination of the entire production to consumption sector is provided by a few executives, they will be able to rapidly adapt to changes in production technology or consumer desires. If this model were to become the norm, today's pork volume could be supplied by twelve plants and about fifty producers.

With lowered costs, increased coordination, and improved quality, the pork industry could have net growth of 15 percent over the next decade.

The new megaoperation uses the newest cost effective and sophisticated technology. Some of this technology was applied for nearly a decade before the Midwest began to explore its use. Once the optimum technology is found, it is then standardized into buildings, equipment, genetics, nutrition, health programs, and management techniques. In addition, it is applied in large units to minimize fixed costs per hog and employs detailed monitoring and control systems to enable continued improvement.

In North Carolina, contract production is also

part of industrialization. The "integrator" as the megafarm is called, owns the hogs and provides the feed, medication, transportation, and technical services. Local farmers then invest in buildings and equipment and provide land and labor. In return they receive a contractual fee, and sometimes additional financial incentives for superior performance. Profits or losses accrue to the integrator. Contracting allows the integrator to grow rapidly by leveraging their own equity and management resources since other farmers provide substantial portions of the capital, land, labor, and management.

This is truly a pork manufacturing system, based upon discovering technologies and then applying those technologies with the sole objective of producing low-cost, consistent, high-quality pork at moderate prices, and to coordinate production on long-term agreements with the packer. When the chosen system is successful, it can be replicated many times over.

There are other local factors contributing to the phenomenal expansion of North Carolina's industrialized pork sector. Resource costs for labor and buildings are lower than for the Midwest. Lenders have seen the success of the contract system and seek ways to stabilize farm incomes as potential loss of revenues from tobacco looms in the future. And many argue that the environmental regulations are less stringent, essentially allowing the megaproducers to achieve scale economies at some unknown cost to the environment.

Producers in states such as Missouri, Oklahoma, Arkansas, Texas, and Colorado are following North Carolina's lead in developing similar new highly coordinated pork systems.



This \$2.2 million operation has two gestation, two breeding, and two farrowing units—and 3,500 sows.



Dale Murphy's 3,500-sow unit.

Cause for anxiety

Nearly all industry participants in the traditional hog production areas are asking difficult questions. Will the industry be totally integrated like poultry? Will there be a place for me and my resources? What must I do to assure a longer-term place in this business? How can I utilize old facilities to incorporate new technology? Will I have market access? Will I become a low-paid employee of an agribusiness corporation? Will the need for input distributors be eliminated as large producers buy direct? Will there be a need for a local financial loan officer?

The realization of traditional participants, from farmers to those in the input and the marketing sectors, is that their specialized physical and human resources will become worthless if they cannot be a part of the new industrialized pork industry.

The questions extend beyond those directly involved with the industry. How do production practices and higher animal concentrations affect water and air quality? Will the farmer lose the traditional independent status? Will industrialization affect the social structure of the local community? What is the economic impact on local communities when huge hog operations buy many of their inputs from outside the community? What happens to the profits from the operation; do they now flow to an investor in some far-off urban area? When does the industry become too concentrated and begin to extract monopoly profits from consumers?

Likely implications

Some implications seem evident at this time; others will depend upon the decisions made by industry participants and public policy makers. But as a starting point, some economic observations seem to be in order.

- Many current producers have high costs, utilize dated technology, have small diversified farms

which retard their ability to gain managerial intensity, and are nearing retirement age without sufficient sizes of operations for someone else to acquire and operate. They will likely be replaced by larger, more specialized, and more managerially-intense operations.

- A large number of pork producers will continue to leave the industry. Currently 28.5 percent of the nation's hog inventory is on farms with less than 500 head of hogs. As a group, this segment is losing U.S. market share at a rate of about 2.25 percent per year. This trend is likely to continue and most of this groups' 28.5 percent contribution could be lost.
- Over time, the industry will move toward much larger quantities of lower cost-units to exploit known economies of size.
- Out-migration of smaller farms in coming years, including the "under 500 head" size and some larger operations, may total around 35 percent of today's production. At the current trend this could occur in a decade.

For the Midwest to maintain its dominant market share, the region will need to rebuild and recapitalize.

- With lowered costs, increased coordination, and improved quality, the pork industry could have net growth of 15 percent over the next decade.
- With potential for 35 percent out-migration and 15 percent net growth, the industry will largely be revamped. Who will produce these hogs and where will they be raised?
- For the Midwest to maintain its dominant market share, the region will need to rebuild and recapitalize.
- If economic advantages of improved coordination of production and processing are evident, the Midwest industry will be forced to find ways to reduce variability, to improve marketing efficiency, and to provide better signals between consumers and producers. In other words, it must move away from a traditional commodity orientation toward a consumer and cost-driven pork system.
- The Midwest can no longer rely on its natural resource base and industry infrastructure as sufficient conditions for industry location. Integrated firms are large enough now to provide all of their own support and can take their systems where they will be allowed to operate.

- The greatest returns in the pork system of the future will increasingly flow to those who can put together technology packages and deliver differentiated products to the world's consumers, not to those who own the production facilities as in the past.

Predicting future structure

Structural change will continue in the pork industry, but the degree of integration remains unclear. There remains a major existing investment in the more traditional commodity-oriented systems, especially in the Midwest, and it is likely that substantial portions of this system will be able to remain competitive.

In general, the Midwest industry has examined the types of changes needed to be fully competitive with more highly integrated systems. Some producers have improved genetics, introduced cost lowering technology, and explored the best size of operation. Some have reduced costs through buying groups, marketing groups, and in cooperative gilt multipliers. Most packers have moved away from their commodity orientation toward pricing systems which differentiate the value of each carcass, with information transmitted to producers. They are also exploring new ways to coordinate movement of animals from farms to plants, as well as seeking more knowledge about consumers.

Given their positive attitudes and willingness to change, it is premature to write the independent producer and packer out of the industry.

Given their positive attitudes and willingness to change, it is premature to write the independent producer and packer out of the industry. Their continued success will depend on their ability to incorporate some of the best features of the highly coordinated operations with the unique advantages of independent operations. It seems very likely that a number will be able to accomplish this task, but the Midwest industry remains vulnerable.

Most states have established regulations on the pork industry. Some have attempted to regulate the structure of their state's industry. They use environmental laws to discourage larger farm operations, anticorporate farming laws, anti-integration laws, and local zoning ordinances.

The stakes are high. Greater restrictions on cer-



Smithfield's 8 million-head plant.

tain types of firms may limit growth of the industry in a state or region. Blocking certain firms may retard investment in new technology, or prolong the time period before the local industry accepts new technology in the state. Attempting to use public policy to protect potential inefficiency in production or processing may set in motion an overall decline in the state's industry.

In addition, as the industry becomes more concentrated in both production and processing—given the potential for out-migration and industry growth over the next decade—some regions of the country could see massive expansion of the pork industry with all the potential economic benefits. Alternatively, areas that do not allow change could see their region's industry wither and even perish. Thus, new regional bidding wars have already developed to attempt to attract the industry to specific locations.

Coping with change

Industrialization has already caused marked changes in the pork industry. Most industry participants, especially those entrenched in more traditional beliefs and practices, worry about the changes and their future. A further movement toward much larger production units which are more highly coordinated with the packer and the consumer seems to be a given. Domestic and foreign consumers will likely be major beneficiaries as pork businesses produce and market at lower costs and with enhanced quality and consistency.

However, the traditional independent producers and packers in the Midwest have recognized these changes and are making adjustments which will improve their competitive position relative to highly integrated pork systems. Thus, some combination of integrated and independent producers appears to be in the structural mix for years to come, although the independent system will forever be altered relative to its historic design. ■

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