

Iowa's Pork Processing Industry

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Iowa is the largest pork processing state in the United States. In 1994, approximately 32 percent of the nation's hogs were processed in the state (Figure 1). By 1996, that share had fallen to 28 percent as Iowa hog numbers declined and processing facilities expanded outside of the state. There are 11 packing plants in Iowa that process at least 2,500 hogs per day, with the combined capacity of these plants at 95,000 hogs per day. These facilities and other smaller meat processors account for approximately 7 percent of all of Iowa's manufacturing jobs.

Plants are generally located near a large supply of hogs. In addition to Iowa, packers have located in southern Minnesota, eastern Nebraska, northwest Illinois and Indiana. New plants have been built in North Carolina and Oklahoma where rapid hog expansion has occurred. The supply of hogs is the most significant factor in plant site selection, but packers also prefer to locate in a community that can support a labor force.

Changes taking place

Traditionally the pork processing sector has been a highly competitive, low margin business. The three largest beef packers entered the pork processing sector in the 1980s. That brought about a major reinvestment in packing infrastructure and plant expansion, and Iowa switched from a hog exporter to a hog importer in 1987 (Figure 1). In 1996, Iowa packers imported approximately eight million hogs from other states and Canada to keep their plants operating near capacity.

Figure 1.



The pork processing industry is becoming increasingly concentrated as the percent of hogs processed by the four largest firms increases. This percentage is estimated to be as high as 57 percent in 1997, up from approximately 32 percent in 1985. By comparison, the hog four-firm concentration ratio is considerably less than steer and heifer (80 percent) and sheep and lamb (74 percent) markets. The ten largest pork processors control more than 80 percent of the nation's hog slaughter capacity (Table 1).

Table 1. Estimated 1997 Plant Capacity of the Largest Pork Slaughter Firms.

Rank	Company	Daily Capacity (1,000 head)	Capacity Share (Percent)
1.	Smithfield	80.3	19
2.	IBP	72.6	17
3.	Swift (ConAgra)	39.4	9
4.	Excel (Cargill)	37.8	9
5.	Hormel	34.7	8
6.	Farmland Foods	33.8	8
7.	Seaboard	15.0	4
8.	Thorn Apple Valley	14.0	3
9.	Indiana Packers	13.0	3
10.	Lundy's <u>8.0</u>	<u>2</u>	

Source: Meyer, S.R.. "U.S. Hog Slaughtering Capacity, February 1996," NPPC Pork Industry Economic Review, March 1996.

The firms in the top four slots have changed a lot over the years. Smithfield, the largest, was fourth in 1994 and eighth in 1990. The company expanded by building the largest plant in the world in North Carolina (now processing 26,000 per day), and acquiring John Morrell plants in the Midwest. The current number two, IBP, was in the top slot for several years. They continue to grow slowly. IBP added new Indiana plant capacity but closed the Council Bluffs plant in April 1997. Farmland has increased in size, while Hormel has declined in size. Seaboard opened a new plant in late 1995 in Oklahoma, and is moving it to a double shift in 1997.

Processing capacity limits were hit for the first time in decades during the fall of 1994, resulting in sharply lower hog prices. Packer capacity has increased nearly 15 percent between 1994 and 1997 and is expected to remain in excess of hog supplies in the years ahead. Much of the increased capacity is being built outside of Iowa but some will compete for hogs that are currently being shipped to Iowa plants.

The steady trend toward greater concentration in hog processing has aroused concern about the possibility of anti-competitive conduct in the slaughter hog market. Specifically, producers sometimes worry that big packers may be able to use their market power to depress hog prices below competitive levels.

There is little evidence to justify these fears. In a 1991 study, Schroeter and Azzam found little difference between actual prices for hogs and their estimates of "competitive" prices. Nor have packer earnings shown indications of monopoly power.

Using American Meat Institute survey data, it can be shown that hog packer average net earnings never exceeded 1.6% of sales in the 1979-87 period. Although these findings are based on figures from before the sharp recent increase in concentration (see Figure 2), the evidence embodied in packer margins (the difference between the wholesale price of a pound of pork and the price of an equivalent quantity of market hog) suggests that little has changed in the past 10 years.

Increasing integration

Another significant change in the pork processing sector is a trend to increased integration. Smithfield Foods, the largest pork processor, considers itself an integrated food company. It owns the third largest hog producing firm in the United States and is tightly coordinated with other large producers. It has branded pork in stores and an experienced distribution system. The company call for continued growth in integrated pork production and processing.

Seaboard, a leading poultry producer and now the eighth largest hog processor, has developed a coordinated pork production system into the seventh largest U.S. hog producer around its new processing plant in Oklahoma. Farmland Industries, a farmer-owned cooperative, has processed hogs since the 1960s. It is pursuing several coordinated production systems with producers that will link all segments of the pork food chain from genetics and feed to a branded product.

A study by the National Pork Producers Council estimated the cost of non-conformities originating from the production level is \$10.08 per head. An additional \$2.32 per head cost of non-conformities occurs at the packer and processing levels. These losses provide an economic incentive of more than 10 percent of the value of the hog to improve pork quality, and coordinated or integrated pork production and processing systems are methods to capture this payoff.

However, other attempts at integrated pork production have been less successful. Tyson, the nation's largest poultry producer and sixth largest hog producer, has been producing hogs since the early 1970s. They bought a slaughter processing plant in 1993 and sold it in 1995. Premium Standard Farms, the nation's seventh largest pork producer, opened a new processing plant in late 1994 near its production in northern Missouri. The company filed for bankruptcy in 1996, but it successfully restructured its debt and continued operations.

In addition to integrated and tightly coordinated production and processing systems, there are increasing linkages between traditional processors and producers in the form of long-term marketing contracts. These contracts typically are written for five years or longer and can provide advantages for both producers and processors.

Producers are assured market access and may be provided price risk-sharing terms to protect them from extremely low prices. The processor is assured a steady supply of known quality hogs and under the risk-sharing terms, is protected from extremely high hog prices. The contracts provide a method of improving communication between producer and processor on issues of scheduling and quality.

Iowa law prohibits packers from owning hogs in the state of Iowa, but does not prevent them from owning hogs in other states and processing them in the state. There are no regulations on marketing contracts between producers and packers. Currently, all major packers serving Iowa are offering or considering some type of long-term marketing agreement with producers with a variety of alternative pricing methods.

A recent Packers and Stockyard Administration study of pork industry coordination systems found that the use of packer and producer agreements was expected to increase. Packers reported that

they bought 87 percent of the hogs they processed in 1993 on the spot market, but they expected this number to decline to 66 percent in 1998. They thought the share bought via marketing contracts would increase from 11 to 25 percent. Joint ventures and other arrangements would increase from 2 percent to 8 percent of the total.

In 1995, another study estimated the spot market represented only 62 percent of 1994 marketings and that more than 26 percent were sold on a formula price contract, with the remaining 12 percent either produced by the packer or purchased on a risk-sharing agreement. This suggests the industry reached the projected coordinating system composition for 1998 in 1994. Increases in long-term contract volume are still occurring rapidly. Iowa State University economists estimate that approximately one-third or more of all hogs were committed to packers via contract or direct ownership in 1997.

The primary concern for producers about concentration of the processing sector is the number of buyers at the local level. Iowa currently has a very competitive market for hogs. A 1994 study found approximately 200 buying stations and plants in Iowa. A representative producer in each quadrant of the state had five or more different companies bidding for hogs in a 50-mile radius.

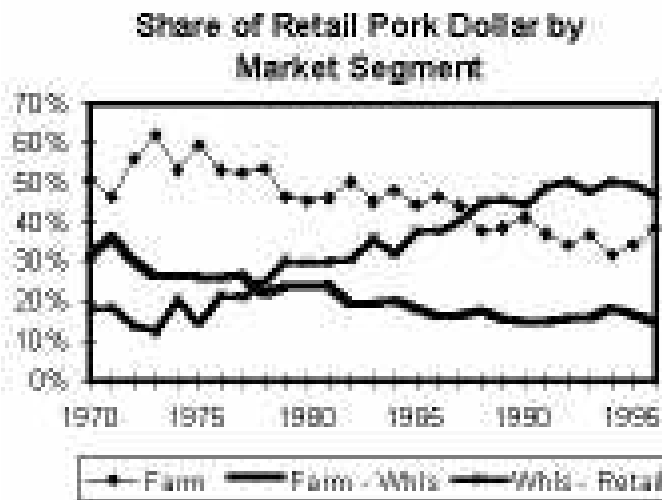
While the market is competitive now, there is concern that if plants close due to a shortage of local supplies, or if packers meet the majority of their needs with long-term contracts, the market will be less favorable for remaining producers. There is limited evidence to suggest that the closing of an individual plant shouldn't have a significant impact on hog prices in the long run. Previous research has shown that although prices may weaken initially when a plant closes, prices do return to pre-closing levels as competitors move into the market.

Another study reported that producers in an area where a plant has closed benefit relatively less from a rising market than producers in other markets. If Iowa loses a large share of its packer capacity so that there aren't buyers nearby to fill the void, prices could decline relative to other states.

Packer Margins and Employment

Although packer margins are both seasonal and cyclical, they have remained relatively constant in recent years as packers fought for market share. In general, the packer's share of the farm-to-wholesale margin is about the same as it was in 1980, reflecting improved packer efficiency and stagnant nominal wages (Figure 2). The wholesale-to-retail sector margins have increased at approximately the rate of inflation. The farmer's share of the retail pork expenditures has declined to an average of 35 percent in the 1992-1996 period.

Figure 2



A trend within the processing sector is for packers to move into further processing to capture part of the wholesale-to-retail business. More deboning, trimming and further processing is occurring at the slaughter plant. In 1987, 81.5 percent of the product left the plant as primal or fabricated products. By 1992, this number had risen to 92.2 percent. Another example of this trend is that IBP purchased Food Brands, a food service company, and is now a major supplier of the food service sector.

Meat packing jobs tend to be lower paying employment. Meat packing and processing jobs are relatively low skill jobs and packers can operate their plants at acceptable levels with relatively high turnover rates and inexperienced employees. Part of the cost control reflected in Figure 2 is attributed to stable or falling wages in meat processing between 1987 and 1992.

Meat industry wages were 82 percent of manufacturing wages in 1987 but fell to 71 percent of the manufacturing level by 1992. Adjusting for inflation by expressing 1987 wages in 1992 dollars shows that meat industry wages were 31 percent higher in 1987 than five years later.

Packer Cost Structure

The cost of hogs typically comprises 70 percent of all fixed and variable costs for a slaughter-processing company. The other costs of operations in 1996-97 averaged \$20 for two-shift plants, while the single-shift estimates averaged \$22 per head. Labor costs typically comprise approximately 50 percent of these remaining variable and overhead costs. An important variable cost difference among plants was the extent of further processing and fabrication of pork products in a plant deboning and further processing involves much higher labor costs.

Average estimates of fixed plant and equipment costs were \$6 per head for single-shift and \$3 for double-shift plants. So there is a clear rationale for double shift plants where other factors do not offset these economies of size.

Capacity utilization rates can have a significant effect on costs per head and pricing behavior in the market for hogs. Approximately 60-70 percent of variable costs are essentially fixed within the first four days of the week. When the number of hogs purchased is below 80-90 percent of plant capacity, packers often are more willing to bid significantly higher prices for hogs and/or haul hogs further distances, since the marginal costs of killing and processing them are quite low relative to expected prices for the end products.

Since packer capacity has to be large enough to handle the seasonal and cyclical peaks of hog production, this leads to occasional periods when packers' hog procurement behavior appears to be destructive competition, with bid prices surging and farm-wholesale margins dropping sharply. Because plants operate cheaper at optimal capacity, individual packers have an incentive to bid hogs away for a competitor's plant. If packers colluded to share the available supply of hogs, all of the plants would be below capacity and profits would decline.

This need to fill capacity also is a significant incentive for vertical integration into hog production or long-term supply contracts with hog producers, to reduce a packer's susceptibility to the vagaries of spot market hog supplies.

If another plant is added to an existing operation, costs of administrative overhead typically increase less than volume increases, though the cost impact will vary depending on the number of plants and the extent of under-utilized capacity in the administrative and staff functions. Costs do decline as volume and market shares of the largest firms increase, though market concentration and potential market power also may increase.

However, the excess capacity usually found in this industry, in combination with the small marginal costs of processing more hogs in that environment, provides a strong incentive to each firm to

bid a larger share of hogs available away from its competitors. For firms slaughtering and processing hogs into relatively undifferentiated fresh wholesale pork products, and into processed products in which few firms have successfully differentiated a large proportion of their products, this makes it very difficult to consistently reap high profit levels. As a result, plant utilization is a key element of packer profits.

Looking to the future

Increased packer concentration seems likely in response to the economies of size, both within plants and in multi-plant operations. Stronger long-term vertical linkages will continue to increase in importance to reduce quality and quantity risks which are quite costly to packers, and to provide assured market access and increased quality and quantity consistency incentives to producers. Overall efficiency is likely to be enhanced, but market power issues will become more frequently raised if current trends continue.

Does Iowa need to raise hogs to have a viable pork packing industry? The simple answer is yes. While Iowa packers haul hogs great distances to existing plants, a predictable supply of hogs in close proximity is the most important criteria in choosing a site for a processing plant. Current plants can be operated by transporting hogs from other regions. But packers will be reluctant to reinvest in existing facilities if the supply of hogs in the long run is inadequate.