Industry Integration: Where will it Leave Us

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▪ Introduction

The pork production sector is undergoing a significant, perhaps unprecedented change in its size and ownership structure. Further, the marketing linkages of pork producers with meat packers are changing dramatically. These changes can have profound effects on industry performance. The appropriate strategies for virtually all the players in or associated with the pork industry, such as feed companies, breeding stock and animal health suppliers, producers, processors, pork merchandisers, and others will be affected.

In the 1980s, there were very limited arrangements for contract production and long-term marketing in the pork sector, and large-scale production was beginning to grow rapidly in the Southeast US. In the 1990s, the industry was rapidly consolidating, contact production was common place and marketing contracts were beginning to surface. In the mid-1990s, Grimes and Rhodes and a closely related study by Hayenga, Rhodes, Grimes, and Lawrence documented the growing importance of long-term marketing links between producers and packers, and the rationale for that growth for both producers and packers. In 1993, only 13 percent of US hogs were owned by or contracted to packers. By 1997 this figure had grown to 57 percent with estimates for 1998 to be near 65 percent. The bulk of these non-spot market transactions were marketing contracts and packers owned less that 10 percent of the hogs they processed. Following the disastrous market of 1998-1999, it is now estimated that packers own 22 percent of the US breeding herd and the spot market represents less than 30 percent of the hogs in the US.

Vertical integration in the pork sector is a major concern for traditional firms, both producers and processors. It is taking shape via networking, long-term marketing contracts, and through direct ownership of the hogs by packers. While these vertically related firms may have cost and return advantages over other firms in the industry, there are other more fundamental issues of market power, captive supplies, and thin markets that may impact producers in the

open market as well as part of a coordinated system. This paper will document the extent of coordinated marketing in the US and discuss some of the implications of the evolution to a more vertically aligned pork chain.

▪ Networking

Networking is an alternative to production and marketing contracts or vertical integration. It is sometimes advocated as a means to get the benefits of larger scale operations or vertical market linkages without formal contract or ownership ties. In the 1998 survey by Lawrence, Grimes, and Hayenga, operations marketing less than 50,000 head reported that approximately 14% of operations (17% of their hogs) were involved in hog market networking arrangements; close to 10% of these operations and a higher percentage of their hogs were involved in input purchasing, hog production and information-sharing networks. Larger operations were typically more involved in networking. At a minimum, approximately 10% of the U.S. production accounted for by medium-sized producers is involved in networking.

Although networking is often cited as a management tool for smaller producers, there is more networking activity among the largest size groups and within the medium-sized operations. Hog marketing and pig production networks are the most commonly used types of networks by medium-sized producers. Large and very large producers were also involved in networking. Five of the 18 very large producers, accounting for 46% of the hogs they produced and 11% of total U.S. production, were involved in a network. Nineteen percent of the 50-500 thousand head producers used networking, accounting for 21% of their production and 2.7% of the U.S. total. The types of networks used by large and very large producers were not identified. Combining the share of U.S. production involved in networks from the three size groups suggests that producers involved in networking raised approximately 24% or more of 1997 hog marketings.

▪ Marketing Contracts

The use of marketing contracts between producers and packers has increased sharply in recent years. Nearly 57% of the 1997 marketings were under some type of prearranged agreement with the packer (Table 1). This compares with 37% in 1994 and 13% in 1993. Operations marketing 50,000 head a year or more and those operations outside the Corn Belt had 75% or more of their hogs under contract with a packer. Because market access is a big issue for large-scale operations and those not in areas with many competing packers, this should not be surprising.

Types of Contracts

The dominant type of agreement is a Formula Price Contract, especially for the largest producers and other producers outside the Corn Belt. These contracts are ongoing agreements between the packer and producer in which the selling price is based on an observable market (i.e., Iowa Southern Minnesota, or Western Corn Belt Lean Value). Although 39% of all hogs were formula priced, the largest producers marketed 75% of their production using the formula price system. Relatively few hogs (3%) were priced based on Futures Market Contract.

Table 1. U.S. hog marketings under a prearranged packer marketing agreement, 1997 (%).

Size Class (1,000 Head)	Percent Contracted	Formula	Tied to Futures	Risk Share Window	Risk Share Cost-base	Other
1-2	23.9	16.1	2.6	0.3	0.0	4.9
2-3	32.2	19.3	1.6	1.3	7.8	2.1
3-5	36.0	20.5	4.2	3.6	5.1	2.5
5-10	44.5	26.8	2.6	3.6	6.2	5.2
10-50	54.2	27.5	6.7	3.1	16.5	0.5
50-500	81.5	56.9	3.1	13.2	3.3	5.0
500+	91.8	75.0	0.5	0.0	1.2	15.1
All Hogs	56.6	39.1	2.9	3.1	5.3	6.1

The Risk-Share Window Contract is a contract of fixed length in which the packer and producer share the pain and gain above or below predetermined upper and lower price boundaries. While the operations selling 500,000+ head a year sold no hogs on this contract, 13% of the 50-500 thousand head hogs were marketed on such a contract. The Risk-Share, Cost-Plus Contract establishes a price floor based on a standardized cost of production and changing corn and soybean meal prices. Producers and packers split the price above the floor price; at times of higher hog prices, the producer must pay back any previously received prices above the market price. Medium sized producers are more heavily involved in these contracts than other size classes of producers.

The trend toward long-term marketing contracts has been accelerating dramatically in the last few years, moving another ten points higher in the below 50,000 size class in 1998. Remaining hog producers without a contract show a substantial interest in contracting in the future. Of the producers who did not

have a contract in 1997, 22% indicated they were interested in considering a contract.

Advantages and Disadvantages of Contracts

Producers report that the primary advantage of marketing contracts is increase in prices received. Access to capital, allowed to be in the hog business, or allowed for expansion were moderately important advantages across all size classes below 50,000 head. In prior studies, access to shackle space was considered particularly important to large producers, especially in the Southeast. Disadvantages were less important than advantages, with none being outstanding.

In contrast, producers without marketing contracts rate their disadvantages relatively higher. Their perceptions were that the performance of the marketing system deteriorated in many respects - reduced number of buyers, reduced market access, more expansion, and lower open market prices. In their views, the advantages associated with contracting were slightly less important - better product quality, more efficiency in marketing system, better communication, and better consumer service.

▪ Packer Ownership

In 1997 a relatively small percentage of total hog production was partially or completely owned by a vertically related firm in the pork chain. Fewer than 10% of the hogs marketed in 1997 were involved with packer ownership (Table 2). Only 5% were involved with ownership by a feed company. Slightly more than 1% were involved with another vertically related firm such as a genetics company.

Table 2. U.S. hogs partially or completely owned by a packer, feed company, or other vertically related firm (%).

Size Class	Percent of U.S. Slaughter, 1997		
(1,000 Head)	Packer	Feed Company	Other
500+	8.0	2.2	0.0
50 – 500	0.7	1.5	0.9
1 – 50	0.7	1.5	0.3
Total	9.4	5.1	1.1

Packer ownership changed dramatically following the disastrously low prices of 1998-1999. By October 1999, it is estimated that 22 percent of the US breeding herd is owned by a packer (Table 3). While most of the companies on the list have been building their pork production business, Smithfield, has been aggressively increasing its position in pork production through acquisition of production companies.

Table 3. Packer ownership of U.S. sows, *Successful Farming* 1999

Packer	1,000 Sows	% of U.S. Sows
Smithfield	785	12.5
ContiGroup	162	2.6
Seaboard	145	2.3
Cargill	110	1.7
Farmland	67	1.1
Bell Farms/ Hormel	42	0.7
Lundy	30	0.5
Cloughtery	23	0.4
Total	1,364	21.7

Smithfield already owned a controlling interest in Brown's of Carolina and Circle 4. It purchased five hog production companies in less than a year to become the largest hog producer in the US. Most notably, it purchased Carrolls which was the second largest producer at the time to move Smithfield into the number one spot. Smithfield then purchased Murphy Family Farms (MFF) and essentially doubled in size. On the same day that the U.S. Secretary of Agriculture ask the U.S. Attorney General to investigate Smithfield's purchase of MFF, Smithfield announced it has purchased the pork division of Tyson.

In some regard the purchase of these farms doesn't change the dynamics of the market. First, it does not change supply or demand, as it doesn't add sows or remove shackles. Second, most it not all of these hogs were already under a marketing contract of some kind, so it doesn't change the number of open market hogs. What does change is where the hogs are processed and the psychology of the market place. For example, IBP is currently buying all the MFF hogs in Iowa. If Smithfield pulls these hogs to their processing plants in Sioux City and Sioux Falls, IBP will be in the market for more that 1.5 million head a year. IBP will likely go after the hogs they need in the spot market as well as through contracts. This would make for an interesting time in the Midwestern market.

The yet to be answered question is, "How will Smithfield's competitors react to its recent purchases?" While Smithfield does not process all the hogs they own because of location, it will produce the equivalent of 70 percent of the hogs they process. This "vertical hedge" may leave it in a better position than competitors when hog supplies tighten and prices increase. Will other packers move to buy production operations to make sure they are not the only packer without their own supply?

▪ Complications and Implications

With the evolution to a more vertically coordinated or integrated pork value chain comes new challenges. Many of these issues are concerns that may dissipate during the transition phase from the spot market system to a non-spot market system, the new model of the pork value chain. Price discovery is a prime example.

Price discovery traditionally has occurred in the live hog market as buyers and sellers negotiated a price for the immediate delivery of hogs to a plant. Nearly all the hogs under a long term marketing contract are still "priced" on the spot market even though these producers wanted to avoid selling in the spot market. Formulas, windows, cost plus, and ledgers all use spot market prices as a base, but the footings that this base sits on is shrinking. USDA reports daily the number of hogs trading in the Iowa-Southern Minnesota market and the number that were negotiated. For the six months April through September 1999 the average percent of negotiated hogs each day was 25.5 percent with a range from 16 to 39 percent. While this seems small, it still represents over 33,000 hogs a day. The smallest negotiated sales day had over 21,000 head traded.

This number is expected to decline further as producers in the open market exit the industry or sign a contract of their own. There is also a concern about how "open" these spot market hogs really are. While some reported sales are based on truck load lots bid to several packers, many of the reported sales are based on smaller producers selling to the nearest buying station and reflect very little negotiation. A price is "discovered" in the open market, but is it the "true" price? At a minimum the market is "thinner" than before. A characteristic of a thin market is not necessarily decreased prices, but rather increased price volatility. Thus, prices in the open market may be riskier day-to-day, season-to-season, and year-to-year than before.

There is also a concern that because packers have a portion of their needs in hand they do not have to bid as aggressively in the spot market and these prices could be lower. The beef industry refers to this condition as "captive supplies" and has been researching it for a number of years. Research on

cattle prices have shown a negative, but small impact on prices from captive supplies. A USDA study conducted at Oklahoma State and Kansas State Universities showed that a 1 percent increase in the number of forward priced cattle resulted in a $.03-.05/cwt decrease in cattle prices on a dressed weight basis. Other types of captive supplies had differing price effects, but were not as statistically significant. Thus, packers may be able to influence open market prices by strategically using contracted supplies. They clearly have an incentive to do so since the price they pay for contracted hogs is tied to the open market price. However, they also have an incentive for the plant to run efficiently which implies a full slaughter chain.

▪ Conclusion

The increased use of contracts changes the set of skills needed by the producer. At the start of the 1990s producers didn't worry about marketing because all hogs sold for about the same price. Then value-based marketing systems meant that hogs were valued differently by different packers and producers needed to know how to evaluate their hogs and the packer's buying system. They also needed to collect and evaluate bids from competing packers on a regular basis. Now, producers must be able to negotiate and evaluate contracts rather than prices. Rather than comparing daily bids and taking a chance with a new buyer because you can try something different with the next load, you may sign an exclusive agreement for multiple months or years.

These changes appear to push the price discovery issue either up stream or down steam from its current spot in the middle of the pork value chain. One strategy is for the producer to be a low-risk, low-margin select supplier on a cost-plus contract. These contracts are fairly common in manufacturing and elsewhere in the food business. For example, McDonalds has contracts with suppliers that may produce only for McDonalds using patented equipment. These companies grow as McDonalds grows or as they outperform other suppliers on quality and service. The other alternative is for producers to stand more of the market risk and receive a portion of the value at the wholesale or retail end. This strategy implies strong trust and open books between the parties involved. It also raise questions about who is providing what input and how values should be assigned and rewarded. While it may be easy to compare investment in physical assets like facilities and equipment, how do you value a brand name, distribution system, and research and development into new product development.

Other industries survive and prosper in these types of relationships. The pork industry will eventually adopt these coordination systems as well and will be better positioned to deliver value to the consumer. However, during the transition period there will be an overwhelming tendency to compare the new

model to the good old days and compare the contract price to the open market price, even though neither exist any more.

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