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TRANSFORMING COMMODITY ANIMAL AGRICULTURE: HOW EASY?

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Relentless technological change and intermediate market failure are re-shaping the supply chain for fresh meat. Investment over the last twenty years has primarily been in fixed assets that lower the shutdown price point and lead to structuralized overproduction of commodities. To avoid the non-sustainable approach of a single minded strategy focused on cost reduction, firms are focusing on value-added and branding approaches which present problems with search costs and supply risk. A coordination phase is emerging where firms are experimenting with both contractual and integrated approaches to acquire large supplies of raw materials that support branding attributes. Information sharing is crucial to overcome these problems but oligopoly competitors resist it due to the potential for competitive disadvantage. A new supply chain is beginning to emerge, focused on consumer demand but its implementation is proceeding slowly.

Key words: market failure; branding; integration; commodity agriculture; agricultural marketing; supply chain.

Animal agriculture in the United States (US) has been shaped by relentless technological change and, more recently, persistent market failure. In light of recent price collapses and supply/demand discrepancies, it is apparent that more efficient ways are needed to move commodity markets to value-added supply chains. While it is increasingly apparent that agriculture needs to be responsive to consumer preferences in real time, the food system in the US and elsewhere is very inept and ineffective at achieving this. Some of the reasons why agriculture has been slow to respond to consumer wants include information asymmetries and biological constraints, but also sheer inertia.

Competition And Market Failure

From its early setting of small-scale farms, agriculture has advanced and evolved by technical breakthroughs and innovation. Adopters of technical innovations are able to produce the same amount of output at lower costs -- dramatically improving agricultural efficiency. The incentive to adopt new technologies lies in the ability of early adopters to gain short run profits. These profits drive investment and further expansion. In addition, early adopters are able to invest using funds from outside the farm.

A complicating factor of this form of innovation has been that investment is directed mainly in fixed assets. Investment in fixed assets changes the economic imperative of farms leading to structural overproduction. Once farms invest in fixed assets, there is an economic imperative to continue

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producing even at market prices that do not cover total costs of production. This overproduction leads to what Porter (1996) refers to as "mutually destructive competition." Under such circumstances, the only imperative is to reduce costs to remain competitive. Cost minimization is a management technique, and not a business strategy. Under such circumstances, firms begin to lose strategy as they focus exclusively, or nearly exclusively, on cost reduction.

When mutually destructive competition occurs the only way forward is through product differentiation. The drive for product differentiation has led to the dramatic increase in branding of agricultural products in the United States. However, branding increases the demand for raw materials with specific characteristics that support branding efforts. Agricultural commodity markets have been unable to provide the grading systems and pricing mechanisms necessary to meet these branding needs. This has resulted in the US agriculture experiencing a "risk management phase." For example, after years of long-term profitability the hog markets collapsed in 1998. The price of hogs effectively went to zero for a period of time, and it is estimated by some of the largest lenders in the industry that more equity was lost in 1998 than existed when prices rebounded in mid-1999. Such catastrophic events need coordinated risk management to prevent them from happening in the future.

Why Have Markets Failed?

In order to have competitive markets and competitive market solutions a number of buyers and sellers are needed. In addition, all buyers and sellers need equal access to high quality information. Typically homogeneous products characterize competitive markets. Firms are able to enter and exit a competitive industry easily. Today, all of these conditions fail for production agriculture. Agricultural commodity markets are oligopolistic, there is unequal access to information, products are differentiated, and because of excess fixed assets easy entry and exit is a thing of the past. How we begin to handle such market structures from a policy point of view is part of the question facing US livestock production now and into the future.

Implications of Market Failure

- *The problem of thin markets*. Changing market structures have led to concerns about firm integration, concerns about how contracts are coordinated, and price discovery in thin markets. United States hog producers sell close to 25% of their production in thin markets and the remainder is sold in markets which formula price off these thin markets. As pork producers continue to drive for contractual relationships with, for instance packers, these markets will continue to thin even more, further thwarting price allocation signals.

- *The problem of joint products.* Oligopolies often lead to resource inefficiency as price mechanisms no longer produce clear signals of how much to invest and what to invest in. Unclear investment strategies create innovation lags. These innovation lags can lead to negative externalities and overproduction of so-called "joint products." Animal agriculture is particularly characterized by the problem of joint products. For example, for a chicken producer the premier part of the chicken is the breast. Unfortunately, chickens also have two legs and thighs with every breast produced. These parts are often sold in large ten-pound packages for 29 cents/lb, or sold cheaply on foreign markets, which they can disrupt. As a result, contractual relationships leading to stronger coordination or outright integration have occurred around individual market segments.

- *The problem of revealed prices*. Coordinated contractual relationships and integration have led to mandatory price reporting as producers have demanded that firms report prices. From the producers' perspective there is the belief that packers, for example, are conspiring to drive down

producer prices. A more fruitful understanding of the conflict can be gained by looking at how the major packers, who now operate as an oligopsony, are competing against each other. Packers are at a competitive disadvantage if they reveal their pricing preferences to their competitors.

Capturing Consumer Surplus Via Branding

The tremendous structural shift from the accumulation of wealth in the US has created rising income levels. As income levels have risen, and US consumers have become more time-scarce, they have switched to "value purchasing." Value purchasing decisions have led to the problem of joint products already discussed above. While demand for products with specific attributes creates problems it can also create opportunity for producers. A generic pork chop now becomes a pork chop that is marinated, partially cooked, and can go in the microwave. Capturing the consumer surplus associated with these purchasing decisions by providing value-added products is a major future trend.

Branding

Establishing a consistent brand essentially structuralizes such demand patterns and allows marketing and processing risks to be reduced. Firms can predict a more stable demand for final products and can make appropriate investments in fixed assets. Branding begins with a search cost, identifying those animals that fit the branding strategy. Branding brings economic rents or excess profits, consumers pay more than long-run average costs of production with a successfully branded product, creating "brand equity" that can be maintained over time. Hence, the strategic future for firms is a coordinated system that focuses on consumer wants and purchase drivers. Essentially, quality level merchandising instead of commodity marketing is the strategic alternative. This process, however, is driven by information. Currently, information is hidden between the various segments of the supply chain for meat rather than freely flowing back and forth. Yet information is the critical necessity for coordinating value-added products and maintaining brand names.

The agricultural supply chain has finally woken up to brand management. As a result, there is an opportunistic struggle taking place along every element of the chain. Essentially, he who controls the brand controls the brand equity. Once processors or retailers traditionally controlled brand image. Increasingly, brands may be traced back to the genetics.

In the past, in the United States it has been relatively difficult to brand fresh meat. Although there has been a long 100-year history of branding processed meats like hams, branding fresh meat has never been successful because of the commodity approach. This is changing. Finally branded fresh meat products are arriving in stores, although retailers are trying to reject them. The poultry industry has branded its products for several years unlike the pork and beef industries. Poultry producers have found that as consumers become attached to a particular brand, retailers no longer have the same negotiating power, as the branded product is limited to a specific supplier. Large retail firms are counter-acting by creating their own store brands and pushing own-brand specifications down the supply chain.

One key enabler of brand equity is the ability to define observable traits, and to acquire consistent stable supplies of products that support the brand. This is part of the explanation of firm integration and coordination occurring in the processing and slaughter of animals. Packers and processors currently experience difficulties in obtaining the product attributes that can support branding on a consistent basis. The problem is one of supply risk. As markets transition from commodity-based to value-added production, packers and processors fall into two general categories: some packers believe that they should remain low-cost producers of meat and that others should do the branding. Sorting in the packing plant supports this strategy along with a network of buyers that pick animals with

desirable attributes. Other more aggressive packers are simply buying their way down the supply chain, installing their own genetics, information, and logistic systems in order to create brand equity.

Supply insurance strategies become important in these approaches. The three main strategies that firms are engaged in are as follows: (1) total reliance on spot markets, with the assumption that supplies will be plentiful enough to support branding strategies; (2) looser coordination through contracting which allows more control than the spot market and some flexibility; and (3) full integration which allows full control. All three approaches have pros and cons.

- *Spot markets.* Spot markets offer the advantage of allowing firms to underpay for specific quality traits, as these traits are not rewarded in commodity market prices. Spot markets also lower search costs as animals are brought to the market, and hence, to buyers. Spot markets are also flexible. A firm is not tied into a contract -- they can purchase or not depending on the throughput they wish to achieve especially when spot markets are plentiful. The problem with this approach is that as animals are being contractually committed to other producers in the chain there is a high variance in quality, supplies, and measurement costs.

  Some packers have purchased sophisticated technologies (equivalent of magnetic resonance imaging (MRI) machines), which evaluate hogs coming into the plant. These machines collect a considerable amount of data on each animal passing through at line speed. The goal is to analyze the quality of each carcass, as supplies are not consistent.

- *Coordination.* A coordinated approach has developed from US cooperatives and other entities that engage in flexible, short and long-term contracts with producers. While not overly costly, coordinated brand systems in the US today often do not install enough controls (same record-keeping system on every farm), and lose information clarity. No single decision maker is in control and small producers often accuse co-ops of being like any other mega-operation. Cooperatives often compromise economies of scale and scope because their members are smaller-scale producers.

- *Integration.* At the other extreme of organizational structure, some packers have developed their own systems of production that ensure consistent quality. Fully vertically integrated production systems offer several advantages. First, they offer consistent supplies of brandable traits. Second, economies of size and scope can be fully exploited, at least, where they are environmentally allowable. Third, information flows improve as own systems are installed and adhered to. Fourth, informational logistics can thwart competitive attacks; and, finally, integration avoids the problem of the means justifying the end. In the US, the cost of producing hogs has been artificially high because of other motives than the production of high quality meat. Large feed companies operating several mills have stimulated hog production from farmers who are contractually related to them. The motive here is to increase feed sales rather than branded pork products, and these mixed motives often lead to higher overall costs of production. Integration should avoid this problem of "means masquerading as ends."

  One disadvantage of integration is the high cost of buying into assets as a firm integrates along the supply chain. A firm may have to buy and own preexisting assets that do not directly support brand equity. In addition, price signals guiding investment and other decisions are weakened, potentially leading to wrong decisions. The ownership of assets compounds punishment for wrong decisions. If a firm cannot sell its branded products then it is either stuck with it or it has to sell it at discounted prices. Finally, integration often invites government intervention.

The Future

The structural transformation of commodity animal agriculture into a system responsive to consumer needs has been both painful and slow. The future, however, seems clearer. The new value of information will lie in how it is shared along the supply chain in order to create and insure brand equity. Integration is not inevitable. In fact, vertical chains like "Sara Lee" have already undergone de-verticalization. Sara Lee is an example of a vertical food chain that, because of the high costs of asset ownership has begun to spin them off. We know that consumers cannot be integrated. One cannot purchase a subset of consumers. Public equity markets cannot be integrated either. Hence, at least two markets will operate under competitive conditions -- the market for the final product and the market for capital. The final consumer will ultimately be the winner, as the agricultural supply chain organizes around the creation of customer value.

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