
From the Plains to the Plate: Can the Beef Industry Regain Market Share?

By Russell L. Lamb and Michelle Beshear

Over the past several decades, the beef industry has seen a sharp drop in its share of the retail meat market. While per capita *meat* consumption has grown, per capita *beef* consumption has plunged. Explaining the drop in beef's market share has become a favorite pastime of industry analysts. In fact, a family feud of sorts has broken out in the industry between those who think the decline largely reflects increases in beef's price relative to competing meats and those who stress nonprice factors such as lifestyle changes, health concerns, and so forth as causes of decline. Regardless of the cause, however, the solution to the problem is likely the same.

Whatever the cause of beef's declining market share, the pork and poultry industries have clearly benefited. Poultry, in particular, has seen its market share soar in recent years as per capita consumption boomed. Most analysts attribute the success of the poultry and pork industries to their ability to achieve a high degree of vertical coordination between different links in the production chain. In particular, vertical coordination

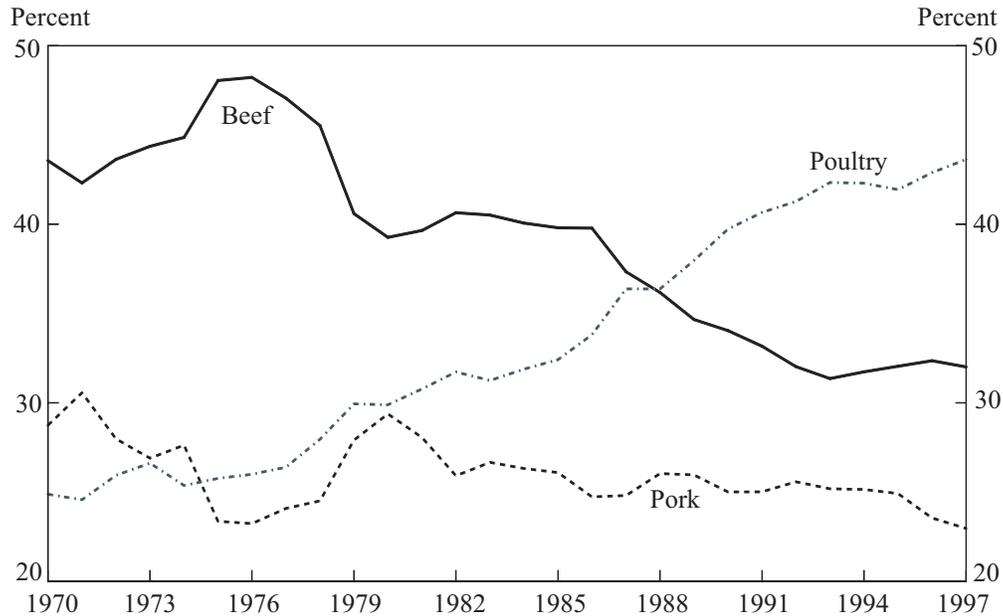
has allowed them to become consumer-product driven industries while achieving significant cost reductions that have lowered retail prices.

For the beef industry to recapture its lost market share it must become a consumer-driven industry. A critical step in the process is achieving a greater degree of vertical coordination across the production chain. Vertical coordination in beef production may take many different forms. In fact, three alternative forms of vertical coordination in the beef industry seem possible, from modest changes in how beef is priced, to marketing cooperatives and producer alliances, to the most radical change—developing a supply-chain structure for beef production. Which path of change the industry will follow is unclear.

The first section of this article discusses why the beef industry has lost market share to poultry and pork. The second section explains how the structure of the beef industry has contributed to its failure to achieve greater vertical coordination. The third section discusses various forms of vertical coordination the industry might pursue, and the relative merits of each. The article concludes by arguing that marketing cooperatives offer the best chance for the industry to recapture market share.

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Chart 1
MARKET SHARES OF BEEF, POULTRY, AND PORK



Source: U.S. Department of Agriculture, Red Meat Yearbook.

I. WHY HAS BEEF LOST MARKET SHARE?

The beef industry has lost its competitive advantage against the pork and poultry industry over the past two decades. Where beef was once the meat of choice for consumers, it has seen a steady decline in market share since the 1970s. In 1975 beef accounted for roughly 48 percent of consumption of meat products (including poultry). By 1997, that share had plunged to 32 percent (Chart 1).

Beef's decline in market share has prompted analysts to propose a number of explanations for the American consumer's waning interest in beef. Analysts disagree as to whether the decline

in beef consumption represents the effect of price or nonprice factors such as consistent quality, lifestyle changes, or health concerns. Regardless of the cause, overcoming beef's inability to compete with other meat products is the critical challenge facing the industry.

Perhaps the key to meeting the competitive challenge posed by other meats lies in understanding the success of the other segments of the meat industry. Many analysts believe that the poultry and pork industries have been successful by transforming themselves into consumer-driven industries, a move that has both driven down costs and enhanced the consumer appeal of their products. A key in accomplishing the transformation was achieving a high degree of coordina-

tion between different links in the production chain, or vertical coordination. Beef's failure to achieve greater vertical coordination, and thus transform itself into a more consumer-driven industry, may explain its declining market share.

The failure of the beef industry to achieve greater vertical coordination may reflect the fundamental nature of beef production and the underlying structure of the industry, a structure that has changed little in the last decade. The three links in the beef production chain differ dramatically in structure, from a highly concentrated meat packing industry to highly competitive feedlot and cow-calf segments of the production chain. This structure makes coordination between ranchers, feeders, and packers difficult to achieve; moreover, it has contributed to a high degree of mistrust between segments of the industry. The failure of industry structure to adapt to the changing demands of the food industry is at the root of its declining share of the consumer food dollar.

Price vs. nonprice factors

Beef's declining market share has been attributed to a number of factors. Among factors cited for the decline in beef's popularity over the years, it is useful to distinguish between price and nonprice sources of decline. Nonprice factors include the lack of consistent quality, lifestyle changes, and health concerns. In fact, both price and nonprice factors likely play some role in the decline in consumer demand for beef.

Price factors. Many analysts believe that the price of beef relative to competing meats is a primary cause of declining market share. Beef is often the most expensive meat at the meat counter. The inflation-adjusted price of beef has declined for several decades, as prices in the rest of the economy rose more quickly. But when beef prices are compared with prices for other sources of protein, the picture changes. The price of beef relative to poultry has trended

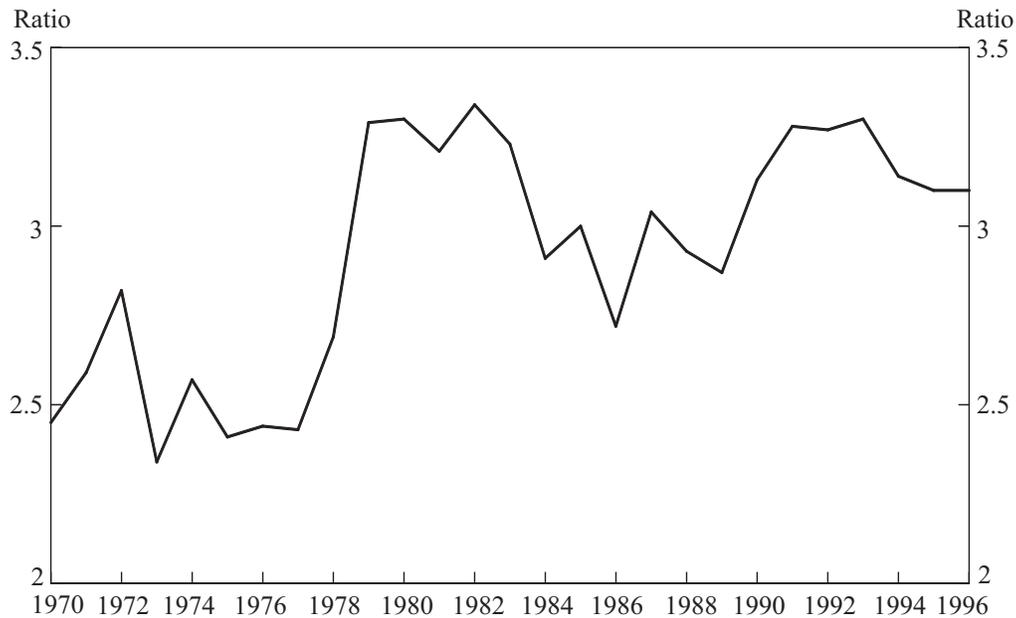
higher since the mid-1970s, because poultry prices have declined more quickly than beef prices (Chart 2). For example, beef prices relative to poultry were 38 percent higher in 1993 than in 1975. Since 1993, however, the price of beef relative to poultry has declined. But beef's share of the consumer meat dollar has not risen, calling into question the ability of price movements alone to explain problems with beef demand.

Nonprice factors. While price likely explains some of beef's declining share, nonprice factors play a role as well. In particular, the beef industry has done a poor job of developing products that meet the changing demands of consumers. For example, many analysts point to the lack of consistent quality in beef. Consumers want a high average level of quality, but they also value consistency in their meat products. Wide variations in the quality of beef make consumers leery of purchasing it, especially given its relatively high cost. For example, if the family is looking forward to steaks on the grill, the disappointment of cutting into a tough T-bone may leave a lasting impression that causes them to choose barbecued chicken instead of steaks for their next cookout.

Another nonprice factor that has contributed to the decline in beef demand is the change in lifestyles on the part of most consumers. In particular, the high incidence of dual-income families means that time has become a more precious commodity. Consumers are reducing the time they are willing to spend preparing a meal, raising the demand for conveniently prepackaged, pre-seasoned food products. For example, the poultry industry has been very successful in developing products that are precut and preseasoned so they can be cooked with no preparation. Moreover, they have developed products that can be prepared in microwave ovens, cutting cooking time dramatically. In contrast, the beef industry has lagged behind in developing new products.

Closely related to lifestyle changes have been changes in the type of diet American consumers

Chart 2
BEEF-BROILER RETAIL PRICE RATIO



Source: U.S. Department of Agriculture, Red Meat Yearbook.

want to eat. Consumers are concerned about the levels of fat and cholesterol in beef, and recommendations by health organizations to limit the consumption of red meat have adversely affected beef demand. In contrast, the pork industry has promoted itself as “the other white meat” and reduced the fat in its product to meet changing consumer demands. The beef industry has been far less successful in meeting the health concerns of most Americans. In fact, the current grading system used in evaluating carcasses actually rewards higher degrees of fat content, since they are generally believed to enhance tenderness and taste.

Whether price or nonprice factors are mostly responsible for the decline in beef’s share of the

meat market, a more important question is: How does the beef industry solve the problem of declining market share? The common thread running through all explanations of beef’s loss of market share is that both the poultry and pork industries have done a better job of producing the products that consumers demand, while achieving significant gains in efficiency. A key in reclaiming lost market share for the beef industry lies in understanding the competitive success of poultry and pork.

How have the pork and poultry industries been successful?

A key element of the success in the pork and poultry industries has been their ability to trans-

form their production processes from commodity-driven marketing and pricing to a highly coordinated production process in which each step of the production chain is aimed at producing a final consumer product. The transformation has taken place by creating a high degree of communication across different links in the production chain. Through such vertical coordination, each link is able to communicate to the previous link those aspects of consumer demand that are important for the production process. The power of vertical coordination lies in producing consumer-driven products while at the same time achieving cost reductions that reflect more efficient production.

A useful example of how vertical coordination has transformed the poultry industry serves to illustrate the point. Marketing research has helped large poultry firms, which market their own branded products, to determine that U.S. consumers favor chicken breast meat for its low fat content. However, most consumers dislike the relative dryness of the meat, so they prefer a seasoning that adds moisture and flavor. In response the poultry industry has developed, for example, precut, preseasoned chicken strips and marinated chicken breasts preseasoned with Oriental spices.

The challenge for the production chain is to produce this consumer-friendly product at a competitive price. In the case of the poultry industry, this usually means that the company controlling production, the *integrator*, contracts broiler production to smaller family farms. The integrator supplies chicks to these producers, who are responsible for delivering a predetermined quantity of live broilers at the end of a specified production time. The integrator has bred the chicks to maximize breast size and has developed its own spices after extensive marketing research. Even the wrapping is designed to maximize eye appeal in the meat case. The end result is a finely developed consumer product. And tight control over the process helps keep the final cost low.

It is useful to distinguish between two forms of vertical coordination. With full *vertical integration*, a single firm owns successive stages of the food production chain. An alternative to full vertical integration is *contracting*. If contracting is used to achieve vertical coordination, then different stages of the production process are owned by different firms (e.g., different ranchers, feeders, and packers), but the activities of each firm will be linked by the contract to successive steps in the process.

Whether integration or contracting is used, the most complete form of vertical coordination is the *supply chain* model. In a supply chain, one integrator controls all stages of production, including processing and distribution (Drabenstott). Production is driven by demand for a particular consumer product, which the firm develops in response to market analysis of consumer trends. With a fixed idea of the consumer product to be produced, the firm then determines which part of the production process may be changed to produce that product at least cost.

Vertical coordination has proved hugely successful for the poultry and pork industries. The poultry industry has had a supply chain type of structure for several decades. In 1960, the share of broilers produced under contract was 93 percent (Barkema, Drabenstott, and Welch). Recently, however, full vertical integration has become more prominent, with 14 percent of total broiler production being undertaken by fully integrated firms.

In contrast, vertical coordination in any form has come late to the pork industry. In 1980, for example, less than 2 percent of pork produced was under contract or full vertical integration (Barkema, Drabenstott, and Welch). But this share has jumped to 32 percent in the 1990s (Drabenstott). The shift in production techniques has allowed the pork industry to focus on changing genetics to cut fat, producing the lean meat favored by health-conscious consumers.

Moreover, producers are able to cut production costs even further by tightly controlling feeding and handling. This transformation of pork production has probably been responsible for the industry's ability to maintain market share over the past two decades.

Why hasn't beef adopted a supply chain structure?

In contrast to the pork and poultry industries, the beef industry has not evolved toward any form of vertical coordination. Production is still characterized by several distinct stages, with little coordination between the stages of production. The final stage in beef production is still geared toward producing a commodity-based product. This lack of coordination between links in the production chain, from cow-calf operators to cattle feeders, meatpackers, and the retail outlets, makes it impossible for the beef industry to convey consumer preferences from the retail market place to each link in the production chain. Transforming beef production into a consumer-driven industry is the central problem to be overcome in recapturing market share for beef. A crucial step toward accomplishing this may be achieving greater vertical coordination.

In part, the failure of the beef industry to achieve vertical coordination reflects the unique structure of beef production. The structure of the beef industry is summarized by three links in the production chain: ranchers, feeders, and meatpackers (Figure 1). The three links in the production chain differ dramatically in structure. The cow-calf industry is a classic example of a competitive marketplace, with a large number of relatively small producers. The feedlot segment is also highly competitive, but has become more concentrated recently, and also is faced with few buyers for its product. The final link in the chain, the meat packing industry, is highly concentrated with a few large producers. In fact, the differences in industry structure between ranchers, feeders and packers are an important obstacle

standing in the way of the growth of the industry.

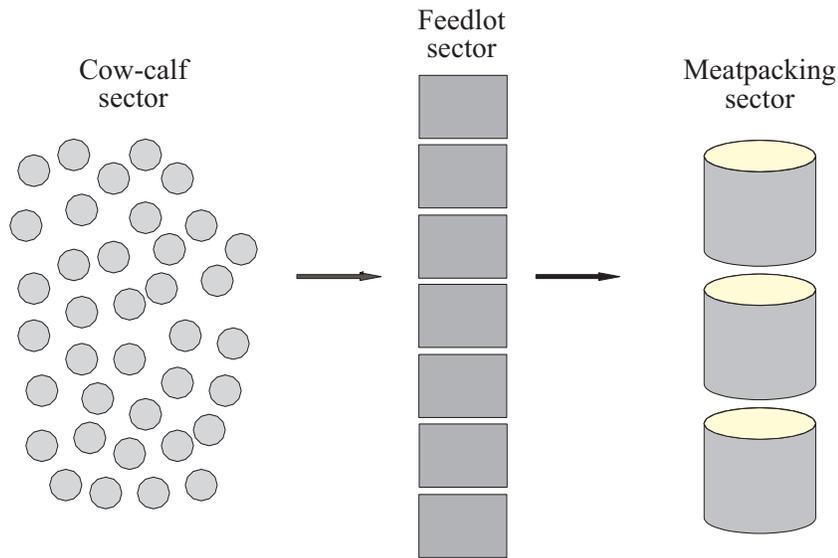
The large numbers of producers and wide geographical dispersion in the beef industry may pose problems for further vertical coordination, if the experiences of the pork and poultry industries are a guide. The rise of both contract production and full vertical integration in the poultry and pork industries has mirrored a move to more concentrated production, with fewer, smaller firms. For example, the top 15 hog producers now own 22 percent of the breeding stock in the United States (Drabenstott). The large numbers of individual beef producers, both ranchers and feedlot operators, likely hinder the growth in vertical coordination. If there are large fixed costs to negotiating any single contract, for example, a large number of producers makes it more costly to move toward contract production. Experience suggests that some sort of consolidation may be a necessary precondition to achieving high levels of vertical coordination.

Few scale economies for ranchers

The first link in the production chain, the cow-calf sector, has remained open and competitive, with a huge number of producers varying greatly in terms of herd size. Moreover, there is little indication that this link in the production chain is moving toward greater consolidation. Producers with less than 100 head still produce nearly half of the calves raised in the United States, compared with roughly 55 percent in 1988 (Table 1). In contrast, operations with greater than 500 head account for 14 percent of total inventory in the cow-calf sector, although they are only 1 percent of total operators. The cow-calf sector has not seen substantial consolidation in production.

The lack of consolidation in the cow-calf sector is not accidental. It reflects, at least in part, the absence of significant economies of scale. Standardized Performance Analysis (SPA) data available from the National Cattlemen's Beef

Figure 1
STRUCTURE OF THE BEEF INDUSTRY



Association (NCBA) program summarize economic performance of 483 herds across the United States between 1990 and 1997. The size of herds sampled ranged from 7 to 15,905, accounting for huge differences in scale of operations. There is not a clear downward trend in production costs across herds of different sizes. Rather, production costs appear to fall into three overall groups (Chart 3).

The smallest producers have the highest costs. Producers with fewer than 50 animals have production costs around \$125 per hundredweight of calf produced. Producers with more than 50 animals, but less than 500, have lower production costs, averaging around \$95 per hundredweight of output. So the smallest herds appear to be much less efficient than slightly larger herds. But this difference likely captures the effect of “hobby farms,” which are not generally run with

economic profit as their primary motive.

The largest producers, those with more than 500 animals, have production costs around \$85 per hundredweight, only a bit below the middle group of producers. But, the decline in production costs is not consistent. For example, producers with 300 to 500 animals reported average production costs of about \$95 per pound, greater than costs reported by producers with 200 to 300 animals. The study showed that production costs did vary by the size of operation, but the relationship is not linear and not strong beyond the smallest herd size.

The lack of scale economies likely reflects the nature of beef production. Exploiting beef’s comparative advantage—its ability to convert forage into pounds of meat—requires extensive production methods. Herd cows are fed on pas-

Table 1

STRUCTURE OF RANCHING INDUSTRY

Number of operations and share of inventory (percent)

	1988		1997	
	Share of operations	Share of output	Share of operations	Share of output
Size of operation				
Less than 50 head	83	34.9	80	30.3
50-100 head	10	19.3	12	19.5
100-500 head	7	45.8	8	36.2
Greater than 500 head ¹	N/A	N/A	1	14.0

¹ In 1988, the largest reported size class was "greater than 100 head."

Source: U.S. Department of Agriculture, *Cattle*, various issues.

ture supplemented with hay, with essentially no grain in their diet. Cattle raised for slaughter are kept on grass as long as possible before being placed on feed because feeding represents a much more expensive way of adding pounds than grazing. Beef cannot be produced efficiently in confinement facilities.

Little coordination between ranchers and feedlots

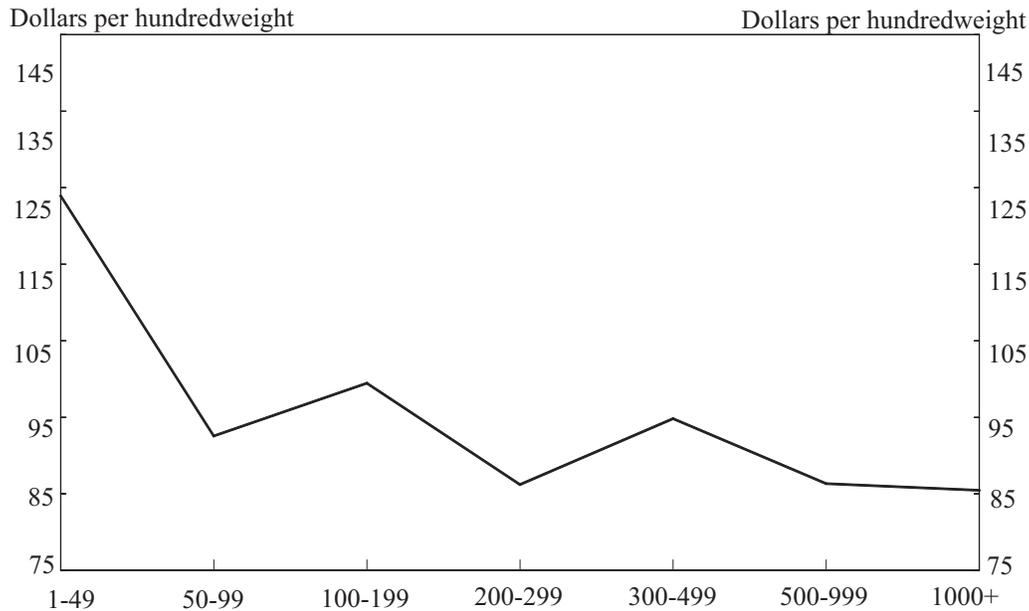
The highly competitive nature of the ranching sector has made greater coordination between ranchers and cattle feeders difficult, if not impossible. While there has been considerable consolidation in cattle feeding, it is still characterized by a large number of individual producers, making coordination more difficult. Moreover, current marketing arrangements make it difficult to design better pricing mechanisms for feeder cattle. These problems in achieving vertical coordination across the first links in the production chain set the stage for many of the beef industry's problems.

Like the cow-calf sector, the feedlot sector has remained quite competitive, but there has been

some movement toward larger feedlots. In 1980, small farm feedlots with less than 1,000 head accounted for 25 percent of fed cattle sold; by 1997 these feedlots made up only 15 percent of the fed cattle sold (Table 2). At the same time, the share of cattle in medium and large commercial feedlots increased from 43 percent in 1980 to nearly 60 percent in 1997. In fact, the largest increase in share occurred in large commercial feedlots with more than 32,000 head of cattle. These large operations now account for 35 percent of cattle on feed, compared with only 22 percent in 1980. Cattle feeding appears to be heading toward greater consolidation.

The ranching and cattle feeding sectors serve to illustrate the difficulties in achieving vertical coordination in beef production. Currently little coordination takes place between feedlot owners and the cow-calf sector. While there are fewer feedlot operators than in previous years, the number is still huge, about 110,000. At the same time, more than 900,000 farms reported some inventories of cattle on January 1, 1998. The coordination problem between such a large number of producers is staggering. Moreover, feedlot operators require uniform lots of cattle of

Chart 3
COW-CALF PRODUCTION COSTS



Source: National Cow-Calf SPA, National Cattlemen's Beef Association.

the same gender, meeting strict weight and frame requirements, to be delivered at prespecified times of the year. Only the very largest ranchers can deliver enough lots of cattle reliably to make coordination with feedlot operators feasible.

Moreover, current marketing techniques for feeder cattle make it difficult to design a pricing mechanism for cow-calf producers that accounts for most of the characteristics of calves produced. Since ranchers are generally paid when feeder cattle are sold, it is impossible to detect characteristics of the carcass at sale time, or even how the carcass will develop. Given the great degree of heterogeneity in the U.S. cow-herd, it is important to control for genetic differences in feeder cattle.

A highly concentrated meatpacking industry

The meatpacking industry differs substantially from other links in the production chain. It is highly concentrated and has been most successful at achieving cost reductions. And meatpackers have made the first steps toward vertical coordination in the industry by developing closer relationships with cattle feeders.

In contrast to the other links in the beef production chain, meatpacking is among the most concentrated industries in the United States, rivaling the auto industry in terms of concentration (Chart 4). Presently, four major meatpacking operations are responsible for processing the

Table 2

STRUCTURE OF CATTLE FEEDING INDUSTRY

Share of feedlot cattle sold (percent)

	1980	1988	1997
Farm feedlots			
Small			
(less than 1,000 head)	25.0	16.3	15.1
Medium			
(1,000 to 16,000 head)	32.3	33.5	27.9
Commercial feedlots			
Medium			
(16,000 to 32,000 head)	20.4	18.7	21.9
Large			
(more than 32,000 head)	22.3	31.6	35.1

Source: U.S. Department of Agriculture, *Cattle on Feed*, various issues.

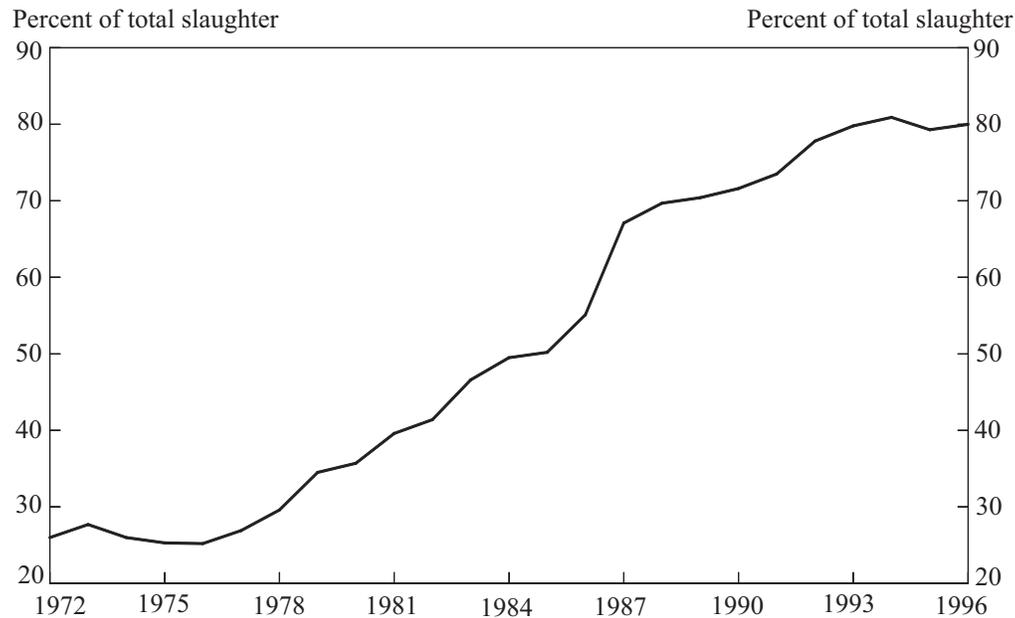
majority of beef in the United States. IBP, Excel, ConAgra, and Farmland currently account for approximately 80 percent of the fed cattle slaughtered. The driving force behind consolidation in the meatpacking industry has been cost. Larger plants have been better able to capture efficiency gains generated by technological improvements. For example, data available on production costs across different groupings in the meatpacking industry suggest that operating expenses account for 14.2 percent of total revenues for the four largest firms, but 17.1 percent of revenues for the 40 largest firms (Table 3). Since the four largest firms are included in the 40 largest firms, this actually understates the cost advantages enjoyed by large packers.

In contrast to upstream producers, meatpackers have been successful at achieving some coordination in the form of market arrangements for fed cattle with cattle feeders. These marketing agreements have developed to provide the constant supply of cattle needed to keep meatpacking plants running at full capacity, optimizing economies of scale. Cattle purchased or contracted by the packer well in advance of slaugh-

ter are referred to as *captive supplies*. Captive supplies can take on several forms: (1) packer feeding of cattle in either packer-owned facilities or custom feedyards, (2) cattle purchased by packers from feeders using forward contracts, or (3) cattle purchased by packers using exclusive marketing agreements with feedlots (Schroeder and others). Captive supplies make up approximately 23 percent of total slaughter for the four largest packers (Packers and Stockyards Administration). Forward contracts and marketing agreements are the most commonly used methods of capturing supplies, comprising nearly 20 percent of total slaughter. Packer-owned cattle make up a smaller proportion of captive supplies, generally 3 to 4 percent of total slaughter.

In spite of the substantial share of fed cattle now under this form of vertical coordination, this effort falls short of providing the needed links between packers, feeders, and ranchers for several reasons. First, these marketing agreements and forward contracts deal almost exclusively with the volume and pricing of cattle to be delivered at a specific date. They do not specify detailed characteristics of the carcasses.

Chart 4
PACKER CONCENTRATION
Four firm concentration ratio



Source: Packers and Stockyards Administration, U.S. Department of Agriculture.

Moreover, since they do not include ranchers in the coordination, they fail to control a critical part of the production process. And since it is difficult to determine the quality of feeder cattle based solely on visual characteristics, there is no way to control adequately for quality.

In spite of the modest movement toward vertical coordination between cattle feeders and packers, the beef industry still lacks a significant degree of vertical coordination. The ranching industry is too large and competitive to allow for significant coordination with cattle feeders or other downstream links in the production chain. And the moderate link between feeders and packers fails to convey appropriate incentives

back to either feeders or, perhaps more importantly, to ranchers. Moreover, there has been essentially no link with retailers, which is surprising, since concentration in the packing industry could facilitate greater coordination. In short, the beef industry currently has no clear path toward greater vertical coordination.

II. HOW CAN THE BEEF INDUSTRY MOVE TOWARD GREATER VERTICAL COORDINATION?

To recapture market share, the beef industry must achieve greater vertical coordination in order to lower costs and convey rapidly changing consumer preferences across the production

Table 3

COST STRUCTURE FOR MEATPACKING FIRMS

Expenses as a share of sales, 1995

	Top 4 firms	Top 40 firms
Total operating expenses	14.15	17.05
Manufacturing	8.49	8.50
Operating and selling expenses	.33	2.70
General and administrative	1.92	2.03
Depreciation and amortization	.48	.64
Interest	.53	.62
Other	2.40	2.57
Operating income	3.33	3.69

Source: Packers and Stockyards Administration, U.S. Department of Agriculture.

chain. The difficulty of achieving further vertical coordination in the beef industry raises an important question: How can the industry change to both lower costs and communicate consumer preferences across the production chain?

Currently, three options for achieving greater vertical coordination and communicating consumer preferences across different segments of the production chain are being tested or considered within the industry. They differ dramatically in terms of structure, the role of economic incentives, and the use of direct production controls. Moreover, at least one option for the beef industry would involve radical change in industry structure. At one end of the spectrum, innovative pricing "grids" would give producers more explicit incentives to alter the type of fed cattle they produce. A more structured and wide-reaching alternative would be the organization of marketing cooperatives and producer alliances to mix pricing incentives and nonprice controls on cattle produced. A final, radical option is a supply chain structure for beef production similar to the pork and poultry industries. Which path of change the industry will follow is unclear.

Pricing innovations

One option for conveying consumer preferences across the production chain lies in changing the way cattle are priced. The live-animal pricing system primarily used in the fed cattle industry fails to convey consumer preferences to cattle producers. Live-animal pricing is based on a price per hundredweight of cattle on the hoof, usually based on a pen of cattle. With this system, all the cattle in a pen have the same value regardless of quality. More importantly, though, values are determined before the quality of carcass is known; so it is impossible to base the value on the quality of beef produced. Rather, value is based on visual observation of live cattle. Innovations in pricing fed cattle have been explored as a way to communicate consumer preferences to producers of fat cattle, providing some coordination between packers and cattle feeders. Several alternative pricing systems for fed cattle have developed. The most prevalent is grid pricing.

Under grid pricing, fed cattle are graded on two dimensions. The *quality* grade measures the

taste and palatability of the meat yielded from the carcass. Currently, four quality grades are given for fed cattle—Prime, Choice, Select, and Standard—where Prime is most desirable and Standard least desirable. Quality grades are determined by the amount of marbling, or intramuscular fat, and the maturity of the carcass. Marbling is a key contributor to quality as it affects the tenderness, flavor, texture and taste of beef. Marbling is often decreased, and overall quality of the meat produced is diminished, in an effort to make beef leaner. Maturity of the animal is also a major factor in the quality of meat produced, since older animals are generally thought to be tougher and have a less desirable taste.

The second dimension of the price grid is determined by the *yield grade*, which indicates cutability, or the amount of edible meat from the animal. Yield grades range from 1 through 5, with yield grade 1 having the greatest amount of cutability. Typically, carcasses with a yield grade higher than 3 are undesirable, since these carcasses yield a smaller percentage of boneless, trimmed retail cuts.

The interaction of yield grade with quality grade determines a two-dimensional scale on which to evaluate carcass value. With grid pricing, the base price is determined based on a Choice Yield Grade 3 (Choice Y3) carcass, with other quality and yield grades priced at premiums and discounts to this base price.

Grid-based pricing does have some drawbacks. The pricing system is complex and requires the reporting of meat prices in a timely manner to obtain the base price, quality and yield grade spread, and volume of meat traded. Independent producers have been wary of this type of pricing system due to the historically adversarial relationship between packers and producers. Producers are concerned that packers have an incentive to report a lower grade for a carcass, since that lowers the value of the animal. In practice, however, an independent USDA grader actually determines the grades for all carcasses.

Producer cooperatives and marketing alliances

An alternative means of communicating preferences across the production chain is *producer cooperatives and marketing alliances*. Producer cooperatives and marketing alliances are organizations comprised mainly of cow-calf producers who band together to market their cattle. The primary goal of these alliances and cooperatives is to enhance the flow of information to members to improve quality, reduce production costs, and increase profitability. A recent analysis by an industry research organization, Cattle-Fax, identified and summarized 25 marketing alliances and cooperatives, although more groups have developed since that analysis.

Cooperatives usually consist of producers at the same stage of the production chain—for example, ranchers—coordinating activities to lower costs, raise prices, or both. This is called *horizontal coordination*. In the case of the beef industry, producer cooperatives are developing to foster links between different stages of the production chain, which is a form of vertical coordination. In addition to pricing innovations, some cooperatives and alliances provide data on feedlot performance and carcass quality to cow-calf producers who are members of the alliance. The flow of information across the production chain will help communicate consumer preferences to each link of the production chain.

Almost all of the cooperatives or marketing alliances have specific pricing options. The pricing options vary among the producer groups and range from a simple grid pricing system based on quality and yield grades to more detailed pricing formulas. So marketing alliances retain the ability to communicate information from packers to feedlot operators, an important feature of the grid-pricing system, but alliances go a step further in passing along information to cow-calf producers. Since decisions by cow-calf producers are critical to the quality of beef produced,

GRID PRICING

With grid pricing, the base price is typically determined based on a Choice Yield Grade 3 (Choice Y3) carcass with other quality and yield grades priced at premiums and discounts to this base price. Premiums are paid for cattle with yield grades of Y1 or Y2, and for animals which have a quality grade of Prime. Discounts are incurred on carcasses which have less desirable yield grades of Y4 and Y5, and quality grades of either Select or Standard. The USDA Choice-Select spread typically determines the discounts for carcasses with a Select quality grade. Standard quality grade carcasses receive a more significant discount than Select carcasses, as they are considered nonconforming by meatpackers. Additional nonconforming discounts for under- or over-sized carcasses, advanced maturity carcasses, or those carcasses with bruising or unusually dark color are also incurred.

Table A-1 is an example of a pricing grid. Note that yield grades can be divided into subgroups such as YG-2A and YG-2B or 3A and 3B. For example, a Select Yield Grade 1 (SE-YG1) carcass weighing 975 would be valued at \$95 per hundredweight of carcass with this example grid (\$105 base -\$5 for Select +\$3 for Yield Grade 1 - \$13 for oversize = \$95).

Table A-1

DISCOUNTS AND PREMIUMS FOR PACKER PRICING GRID

	Adjustment per (cwt)
Quality grade:	
Prime	+\$6.00
Choice	Base
Select	-\$5.00
Standard	-\$15.00
Dark Cutter	-\$32.00
Yield grade:	
1	+\$3.00
2A	+\$2.00
2B	+\$1.00
3A	Base
3B	-\$2.00
4	-\$12.00
5	-\$18.00
Carcass weight:	
> 1,000 lb.	-\$17.00
950-999 lb.	-\$13.00
551-949 lb.	Base
500-550 lb.	-\$15.00
< 500 lb.	-\$20.00

Note: Base price is \$105/cwt for Choice YG-3A in 551-949-lb. range.

Source: Smith, Rod. "Pricing Grids Should Encourage, Reward Producer for High-Value Cattle," *Feedstuffs*. October 1997.

this is a vital step toward achieving effective vertical coordination.

In addition to pricing innovations, producer alliances and cooperatives use various production controls to control the type of beef pro-

duced. Some cooperatives and alliances are breed specific, but many do not limit membership by breed. Some require specific management practices, while others have no restrictions on production practices. Most maintain carcass information to assist producers in modifying

genetics and production practices to meet consumer preferences. In addition to the ability to convey information from packers to feedlot operators, alliances and cooperatives allow coordination between the feedlot operators and cow-calf producers.

Several cooperatives and alliances have also developed retail markets for their products, thereby connecting themselves with the retail sector. Most cooperatives have made an arrangement with retailers to market the product they produce, but in some cases they are developing branded products. A good example of a branded beef product is the Certified Angus Beef (CAB) product that has been produced for many years and has met with great retail success. The branded product is noted for its exceptional quality, and carcasses that meet its criteria are rewarded with price premiums. However, CAB is not linked exclusively with any producer cooperative or alliance but is being used by more than one to better market their product.

The unique feature of these producer organizations is that they allow for participation by all phases of beef production. Increased communication and information in the form of carcass information, for example, allows coordination between cow-calf producers and feedlots, an advantage not possible with only the grid-pricing system. And, some cooperatives and alliances also have linkages with retailers. Coordination between cow-calf producers, meat-packers, and retailers allows for consumer preferences to be transmitted to all links in the production chain—an important step if the industry is to compete with poultry and pork.

Supply chains

The most radical change in the structure of the beef industry would occur with a move toward a supply chain structure. A supply chain structure in the beef industry would enable a single firm to control each step of the beef production process,

from ranching to retail. But control might come from either outright ownership or from a system of tightly knit contractual relationships. For example, the controlling party would be able to specify herd genetics, weaning weight, and vaccinations in the cow-calf sector. In the feedlot sector, the controlling party would specify feeding rations and timing of marketing. Specifications on how packers would fabricate or cut up the carcass would also be controlled by the owning operation. Finally, the manner in which retail beef is marketed would also be controlled.

Which form of vertical coordination will prevail?

It is unclear which form of vertical coordination will prevail in the beef industry; all three options have both advantages and disadvantages. Pricing innovations are certainly a good starting point for conveying consumer preferences to producers, because they reward producers for those characteristics of the carcass that are considered desirable. Moreover, pricing innovations require less radical change in industry structure. But pricing innovations alone may not be adequate to effect the change in production techniques needed. One critical question in the performance of pricing incentives is the link between the carcass quality, measured using quality grade-yield grade relationships, and the quality of consumer beef. If variations in carcass quality can explain a relatively small share of the total variation in the quality of consumer beef, then pricing innovations alone will not be successful in transforming the beef industry.

Producer cooperatives and marketing alliances may be able to overcome the sort of problems discussed above, since they provide much tighter control over the production process. Cooperatives appear to provide the greatest level of coordination among the segments of the industry, including cow-calf producers, cattle feeders, packers, and in some cases the retail sector.

EXAMPLES OF PRODUCER GROUPS

Of the three groups compared in Table A-2, there is considerable variation in the organizational structure and participation requirements of the groups. While all of the alliances have participation by the feedlot sector, only two have a definite relationship with the meatpacking sector. Moreover,

Farmland Supreme is the only producer group of these three that has developed participation with the retail sector. In addition, two of the selected producer groups have specific participation requirements for producers while the third group has no stated requirements.

Table A-2

COMPARISON OF SELECTED PRODUCER GROUPS

	<u>Farmland Supreme</u>	<u>Decatur Beef Alliance</u>	<u>Cenex/Land O' Lakes</u>
Organizational goals	Increase and share the profit pool. Provide information to producers, so they can improve quality and reduce operating costs	To maximize net dollars per head	To provide carcass and performance data to producers; to relate carcass data to value-based marketing
Participation			
Feedlots	Supreme Feeders	Decatur County Feed Yard, Inc.	Selected feed yards are involved
Packers	National Beef	Monfort, Excel	None
Retailers	Yes	None	None
Participation requirements	50% black hides with marbling requirements	Specified weaning program, no breed specification	None
Participation fees	\$2.50 per head	\$10 per head	\$10 per head
Marketing options	All cattle are marketed on a value-based formula	Cattle will be marketed on a value-based grid	All cattle are marketed on a value-based formula
Data	All carcass data and value information. Ribeye area, fat thickness, marbling and kidney, pelvic, heart data are available for an additional \$1.50 per head	Individual animal feedlot and carcass performance data	All carcass data and value information

Source: Cattle-Fax.

Moreover, cooperatives typically promote the use of an efficient pricing system, such as grid pricing. Cooperatives may prove to be the superior method of transmitting consumer preferences across the links in the production chain. For example, carcass data can be conveyed to cattle feeders and cow-calf producers to help them improve the quality of cattle they produce. Data on the performance of cattle while on feed can help cow-calf producers make informed genetic changes in their herd and modify production methods, advantages that cannot be achieved by using only the grid pricing system.

The third option for the beef industry, a supply chain structure similar to the pork and poultry industries, also seems unlikely. The land requirements for cattle production are extremely extensive. In contrast, both the pork and poultry industries use confinement production. There is basically no land required for raising either hogs or broilers, except that required indirectly to raise corn. For the beef industry to ever be fully vertically integrated would require control of huge landholdings by a single entity.

Since both full vertical integration and grid-pricing seem to face insurmountable problems, producer cooperatives seem the most likely to succeed. Only by improving communication and information among the various links in the production chain will the beef industry be able to face the competitive price and consistent quality issues that currently plague it.

III. CONCLUSIONS

Demand for beef products has declined since the 1970s. The beef industry will likely continue losing market share until the industry adjusts to

produce the type of meat that consumers demand at a competitive price. While other parts of the food sector have evolved into tightly knit production chains, the structure of the beef industry has not changed significantly in the last decade. Links between the sectors in the industry—vertical coordination—must develop for the beef industry to be competitive.

Vertical coordination could take three different forms in the beef industry – pricing innovations, marketing alliances, or a fully developed supply chain. The supply chain structure becoming popular in the pork industry seems unlikely in the beef industry, given the nature of beef production. Moreover, pricing innovations alone seem unlikely to achieve the kind of transformation needed in beef production. In particular, it is not clear that grid pricing can successfully convey changes in consumer preferences to cow-calf producers. Shortcomings of complete supply chains and pricing innovations suggest that marketing alliances may be the most successful form of vertical coordination for the beef industry.

Nonetheless, marketing alliances and producer cooperatives are not without their own pitfalls, and much remains to be seen about their effectiveness. In particular, the ability of these innovations to provide the appropriate signals back to cow-calf producers is crucial. And there is inadequate experience to date to ensure that they can do so. Moreover, problems of governance could prove to be serious in cooperatives, as they have in other cooperatives in the agricultural sector and elsewhere. In spite of these problems, marketing alliances and cooperatives provide the beef industry its best hope for transforming the structure of beef production.

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