

Restructuring of Meat Packing Industries:  
Implications for Farmers and Consumers\*

by  
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Mr. Chairman, I am pleased to appear before you today. I have considerable interest in the subject of these hearings. In addition, the folks in Iowa have demonstrated considerable interest in issues of competition in the food industries -- the primary focus of my research. We at Wisconsin are particularly indebted to Congressman Neal Smith for his continued interest and support of our research. Without his support in helping us obtain funding, much of the research on which I will report today would not have been possible.

In my testimony today, I will focus first on the beef packing industry. Since we have done little research at this point on hog slaughtering and processing, my comments on pork packing will be relatively brief. Following this, I will review some of the trends in food manufacturing industries in general in order to provide a perspective of what has and is occurring in meat packing.

U.S. Meat Packing Industry: From Oligopoly to  
Competition to Oligopoly

During the 1960s and 1970s, the U.S. meat packing industry was frequently identified as an industry that had become more competitive over time. Product differentiation was generally minor except for processed and cured pork products. In part because of U.S.D.A. grades, brands of beef have never been successfully established. National concentration of meat packing, which was high at the turn of the century and at the time of the 1920 Consent Decree, experienced a long decline until the 1960s or early 1970s.

Until the 1960s, the "old line packers" (Swift, Armour, Wilson, Morrell) continued to lead the industry with older multi-species (e.g., hogs, beef and lambs) plants. In the 1960s, specialized beef slaughtering plants operated by "new breed" packers began to penetrate the industry by locating new plants in the Western Corn Belt and High Plains where cattle feeding was increasing. Today, plants tend to be specialized by species (hog or beef) and may also be specialized by function (slaughter or processing). Although pork and beef compete to some extent for consumers' meat dollars, they are in separate product markets at earlier stages in the production-marketing system. Beef packers also tend to specialize in either fed beef, which is sold as steaks, roasts and other cuts through supermarkets and restaurants, or in cows and bulls which are boned out and used in ground beef and a variety of processed meat products. Cows and bulls are mostly cull dairy animals. Plants slaughtering these animals are located in the major dairy states. Fed beef slaughterers are concentrated in the major cattle feeding states. About 70 percent of the fed cattle were produced in five states in 1985: Kansas, Texas, Nebraska, Colorado and Iowa.

National concentration of fed steer and heifer slaughter increased from 27.4 percent for the largest four packers in 1972 to 32.3 percent in 1977. Four-firm concentration then rose sharply over the following eight years to 56% by 1986 (Packers and Stockyards Administration data). As a result of three large acquisitions by Con Agra (E.A. Miller, Monfort and Swift Independent) and Excel's acquisition of Sterling Beef, all in 1987, four-firm concentration increased to about 68 percent by the end of 1987 (Exhibit 1). The industry is now dominated by three large companies, IBP, Con Agra and Excel (Cargill), which collectively slaughter over 60% of all steers and heifers in the U.S. This rate of concentration increase is unprecedented. There is no parallel in any of the industries -- food and non-food -- with which I'm familiar.

Fed cattle are slaughtered by two types of plants: 1) plants that slaughter only and sell carcass beef; 2) integrated slaughtering-fabricating plants that both slaughter and process carcasses into boxed beef. Integrated plants are largely owned by the top 20 beef packing companies.

Boxed beef has been one of the major developments in beef packing in the last 20 years. Whereas in the 1960s, nearly all beef left the packer as forequarters or hindquarters, much of it is now sold as boxed beef. Boxed beef accounted for 44 percent of fed steers and heifers slaughtered in 1979 and 77 percent in 1985 (Packers and Stockyards Administration data). The four largest sellers accounted for about 60% of boxed beef sales in 1979, 64% in 1985, and an estimated 82% after the mergers in 1987.

Boxed and carcass beef tend to be shipped from the major production/processing areas to the centers of population -- particularly the eastern U.S. The approximate continental dividing line for beef shipments to the east or west is a line from Texas to Colorado (Faminow and Sarhan, 1983).

Economies of scale exist in both beef slaughtering and processing. In the major cattle feeding areas, a specialized slaughtering plant that kills 250 thousand head per year using two shifts will realize most of the scale economies available. This represents about 1 percent of the U.S. fed cattle slaughter in recent years. Economies of scale appear to be greater in boxed beef processing (Cothorn et al, 1978). Most of the new combination beef slaughtering-processing plants have a slaughtering capacity of 500,000 to 1 million head per year. For this and other reasons, boxed beef processing is almost solely the domain of the largest 20 packers.

Entry barriers into beef packing are relatively high because of the capital cost of a new integrated plant (\$20 to \$40 million), the difficulty of penetrating the boxed beef market, and the displacement effect in procurement markets of a minimum efficient scale plant. In 10 of the 13 regions examined in a study at the University of Wisconsin, a plant killing 250,000 head per year would require at least 10 percent of the total supply, and often much more than that.

De novo entry into the beef packing industry is made more difficult by present excess capacity. Since the late 1970s, per capita consumption of beef has declined significantly. Taken together with the new and expanded plants by leading packers, this has resulted in capacity surpluses in the industry. De novo entry is generally more difficult when an industry has excess capacity and declining demand.

Feedlot-packer negotiations nearly always occur at the feedlot. Whereas 39 percent of cattle were sold directly from feedlots to packers in 1960, this had increased to 90 percent by 1984 (USDA, 1986). Sellers are dependent on packer buyers coming to the feedlot, inspecting their cattle, and making an offer. A study conducted in 1979 found that packers buy 80 to 85 percent of the cattle slaughtered within 150 miles of the plant (Ward 1982). Because cattle are purchased live and the exact market value is only known after they are slaughtered, determining the value of a specific lot of cattle is an imprecise undertaking. Due to transportation costs, shrinkage in cattle weight and uncertainties concerning the price they will receive

in other regions, feedlots rarely ship unsold cattle to packers outside their region.

### Impact of Packer Concentration on Prices Paid to Farmers

Fed cattle are purchased in relatively small geographic markets. Thus, the structure of local and regional markets must be examined to understand the nature of competition in fed cattle procurement. Fourteen regional procurement markets were identified by the late Willard Williams (Committee on Small Business, 1979). These regions are shown in Exhibit 2. The concentration of slaughter in these regions has increased sharply, particularly since 1978. The top four slaughterers of steers and heifers in each of these regions accounted for, on average, 48 percent of regional slaughter in 1971, 56 percent in 1978 and 83 percent in 1986 (Exhibit 3). The series of mergers in 1987 very likely increased this further.

What is the effect of increased buyer concentration on the prices paid to cattle feeders for fed steers and heifers? Economic theory leads us to expect a negative relationship between packer-buyer concentration and cattle prices if entry barriers are sufficient for monopsony power to be exercised. This expectation was confirmed by empirical research at the University of Wisconsin-Madison (Quail et al., 1986). Annual fed cattle prices in 13 regions during 1971-1980 were significantly and negatively related to the concentration of fed cattle slaughter in the regions. Holding other things constant such as packer wage rates, distance to coastal markets and the importance of large feedlots, steer prices were estimated to be 30 to 70 cents/cwt. lower in a region in which the top four packers slaughtered 80 percent of all fed cattle compared to a region in which the top four slaughtered 50 percent. For every 10 percentage point increase in the four-firm concentration ratio, cattle prices fell 10 to 23 cents/cwt.

This provides strong evidence that some monopsony power exists in the procurement of fed cattle. The extent to which prices are depressed because of ineffective competition is not great, however. Estimates are generally in the range of 1/2 to 1 percent of selling prices or roughly 20 to 50 cents per cwt. Relative to the cyclical swings in cattle prices of 20 dollars or more per cwt., the monopsony underpayment seems like "small potatoes." Still, in total dollars, a monopsony underpayment of 1/2 to 1 percent in most years represents at least \$50 million annually that cattle feeders lost because of ineffective competition in cattle buying markets.

These findings are generally consistent with several other studies of livestock procurement markets. Menkhaus, St. Clair and Ahmaddaud (1981) related state level packer concentration to fed cattle prices in 12 states for 1972 and 15 states for 1977. A significant negative relationship was found in both years. The four control variables included in their models were similar to some of the control variables used in the Wisconsin study. Miller and Harris (1981) did a

cross-sectional analysis of monopsony power in hog markets using state level data for only one year, 1978. Buyer concentration was negatively related to hog prices at the 10% level of significance. Ward examined the price effects of the number of buyers bidding on pens of cattle and lambs (1981; 1984). In both studies, the number of bidders had a significant positive relationship to transaction price. Schroeter (1988), using a much different approach, found evidence of monopsonistic and monopolistic price distortions in beef packing during 1951-1983. Ward reviewed 12 studies of competition in livestock markets in his recent book (Ward, 1988). He concluded:

"On balance, market structure, whether defined by concentration or number, size, and location of buyers, seems to impact local or regional livestock prices. Available evidence suggests that number of buyers is positively associated with prices paid for livestock. Adding a buyer tends to increase price and removing a buyer tends to lower price. Increasing concentration or high levels of concentration seems to negatively affect fed cattle price levels when measured on a state or regional basis." (p. 168)

These results are also consistent with the broader industrial organization literature on concentration-price relationships. Professor Leonard Weiss, one of the leading scholars in the field, recently completed a review of over 70 studies of market concentration-price relationships. Weiss concluded that about 75 percent of the studies found a significant relationship between concentration and prices. Collectively these studies "give overwhelming support to the concentration-price hypothesis" (Weiss, forthcoming). Most of the studies examined monopoly power (i.e., the relationship between seller concentration and seller prices) rather than monopsony power. However, the theories of monopoly and monopsony power are essentially the same. Strong evidence that seller concentration measures the degree of monopoly power provides considerable reassurance that buyer concentration measures the degree of monopsony power.

Thus, beef packing has high and sharply increasing levels of concentration both in regional procurement markets and nationally, and high barriers to entry. Given the present structural characteristics of this industry, there is a high probability that market power exists both in buying cattle and in selling boxed beef. And, market power in beef packing is unlikely to be eroded or kept in check by new entry. While market power appears to be most likely in live cattle procurement markets, it is becoming more likely in wholesale boxed beef markets as well. If packers are successful in their current efforts to develop brands of fresh beef, they will significantly increase their pricing discretion.

## Hog - Pork Packing Industry

A few comments are in order concerning the hog-pork packing industry. This industry is becoming bifurcated between hog slaughtering and pork processing. Hog slaughtering is undergoing a structural transformation similar to what occurred in beef packing. The Big 3 in beef -- IBP, Con Agra and Excel -- are also the top three slaughterers of hogs with 30 to 40 percent of the U.S. total. And, they are growing rapidly. This has largely occurred in only four or five years. Before that, none of these companies were major hog slaughterers.

The building of monster plants capable of slaughtering 2½ to 4 million hogs per year will accelerate the trend towards increasing concentration of hog slaughter. One of these plants alone will slaughter roughly 3 percent of the nation's hogs.

Although some plants reach out considerable distances to buy hogs, there are strong economic advantages in buying hogs with 100 miles or so of a plant. Shrink and transportation costs are reduced. In addition, many of the large plants have moved to "just in time delivery" of hogs and substantially reduced their inventory of live hogs. This is much easier to manage with nearby hog producers than with distant producers.

These economic forces indicate that relative small geographic procurement areas will be sought for hogs. Indeed, some of the east coast packers that have outgrown their local supply of hogs and have had to obtain part of their supply from midwest states are reportedly moving towards more contracting of hogs in the southeastern states.

These trends toward very large hog slaughtering plants that obtain the bulk of their supply from nearby farmers will likely bring some operational efficiencies. However, they may also lead to a decline in competition for live hogs. As hog buyers shrink in numbers and become more dominant in local procurement markets, the prices paid to hog producers is likely to decline -- at least in the long run. I would expect this to affect Iowa hog producers but to have even a greater impact on hog producers in less dense hog producing areas.

Pork Processing: Of the big three slaughterers, only Con Agra has significant pork processing operations (former Armour operations). Processed pork products include bacon, ham, luncheon meat, wieners and sausages, and canned meats. Regional brands are important in many of these products. As a result, many relatively small pork processors have survived. The trend is for pork processors to reduce or phase-out their hog slaughtering activities and buy pork cuts and carcasses from the Big 3. This is true even for Oscar Mayer and Hormel, two of the major pork processors with strong brand names. Both pay substantially higher wages than the Big 3. Both plan to close their last hog slaughtering operations in 1989.

Other major factors in pork processing are Con Agra (through the acquisition of Armour), Beatrice (through its acquisition of Eckrich and Esmark/Swift) and Sara Lee (through the acquisition of 16 to 18 regional companies such as Kahns, Jimmy Dean, Hillshire and Bryans). Since pork processing has generally been more profitable than slaughtering, it may be only a matter of time before IBP and Excel enter pork processing -- probably by buying an existing well known brand. This could result in specialized pork processors relying on the Big 3 for the supply of raw products but also competing with them in the sale of processed products. Specialized pork processors would then become vulnerable to vertical price squeezes and other competitive tactics by the Big 3.

Mergers have played a major role in the restructuring of the beef and pork packing industries. While IBP has relied primarily on internal growth, Con Agra and Cargill have relied heavily on mergers to develop their strong positions. At least one and possibly three of the recent acquisitions by Con Agra and Cargill appear to have violated Section 7 of the Clayton Act. The antitrust agencies are apparently unconcerned about concentrated oligopolies in spite of compelling evidence from a large number of empirical studies that concentrated oligopolies have many of the performance deficiencies of monopolies: high prices, bloated costs and complacency regarding market or technological opportunities.

#### Broader Structural Trends in Food Manufacturing Industries

Through the late 1970s, the food processing/manufacturing industries of greatest concern to those of us who study competition were those industries with high levels of advertising-created product differentiation. These industries had strong brands, were highly concentrated, were increasing the fastest in concentration, and had high barriers to entry. The preponderance of our research summarized in a 1985 book on food manufacturing (J. Connor et al., 1985) indicated that these industries were the ones most likely to have market power and to exhibit non-competitive performance. This is still the case.

In contrast, commodity-type industries tended to be more competitively structured and gave few indications of serious competitive problems. Producer goods industries (Exhibit 5, column 2) and consumer goods industries with little product differentiation (column 3) were generally characterized by modest and stable levels of four-firm concentration. Since 1977, this pattern has changed. From 1977 to 1982, producer goods industries and low differentiation consumer goods industries jumped sharply in concentration (Exhibit 5). There were 14 census product classes in which the  $CR_4$  increased 10 points or more from 1977 to 1982. These were:

- 4 in meat packing
- 1 in broiler processing
- 3 in flour milling



1 in wet corn milling  
4 in cottonseed and vegetable oil mills  
1 in beer

Only 2 of the 14 had high levels of advertising -- beer and flour mixes -- which is a sharp contrast to the historical pattern. Although mergers were not the only cause of increasing concentration, they played a major role in many of the above industries.

Since 1982, the structural consolidation in some industries has accelerated. A few companies such as Con Agra and Cargill have developed leading positions in several different commodity processing industries during the last decade. If Con Agra's proposed acquisition of Holly Farms is consummated, Con Agra will become the number 1 processor of broilers. Prudential Bache estimates the market shares of the largest four broiler processors would increase from about 52 to 62 percent as a result of this merger (Glaberson 1988). Thus, once again we have an industry that historically was relatively fragmented that has become concentrated rather quickly. Con Agra is also the leading slaughterer of sheep and lambs. Following the mergers of 1987, the four largest slaughterers of sheep and lambs accounted for about 75 percent of this market (Packers and Stockyards Administration estimate). The events of the last decade tell us that we can no longer assume that competition is effective in these commodity-type industries.

### Conclusions

The substantial changes that have occurred in beef and pork packing have brought significant benefits that should not be overlooked. Boxed beef represents a substantial improvement in the marketing of beef. Without IBP, this innovation might not have been accepted. The new breed packers have introduced greater innovativeness and tighter cost controls into these industries. Lower labor costs have probably been at least partially passed on to consumers.

However, there have also been substantial costs from the changes that have occurred. Wages and fringe benefits have dropped sharply in industries characterized by unpleasant and hazardous working conditions. The lower costs of the "new breed" packers have been largely carried on the backs of packing plant workers. And, as competition in livestock procurement markets has declined, farmers have and are likely to continue to realize some erosion of the prices they receive.

Concentration is frighteningly high in beef packing, especially in many procurement markets and in the boxed beef selling market. The latter is somewhat less of a concern at this point because boxed beef is primarily sold to supermarket companies with knowledgeable buyers and sufficient size to exercise some countervailing power. If the Big

3 are successful in developing brands of fresh beef, their market power in dealing with large supermarket accounts will increase.

Given the present situation, any proposed merger by the Big 3 beef packing and hog slaughtering firms should be carefully examined by the antitrust agencies. However, for beef packing, merger challenges may now be a case of closing the barn door after the horse has already been stolen. Concentration in beef packing is already substantially higher than in 1920 when the Consent Decree was enacted to curb the market power of the big five meat packers. The top four packers at that time slaughtered "only" 49 percent of the U.S. cattle, although they also exercised their power through a variety of vertical arrangements (National Commission on Food Marketing, 1966). However, it may not be too late to try to maintain competition in the hog slaughtering and pork processing industries. The antitrust agencies and the Packers and Stockyard Administration should monitor these industries closely to try to prevent a replay of what happened in beef packing.

The beef packing industry has rapidly become a shared monopoly in the sale of boxed beef and a shared monopsony in cattle procurement. Our antitrust laws are relatively impotent in dealing with shared monopolies or monopsonies. Without legislative change, there are few policy options available to restore competition to this large and important industry.

Electronic markets have frequently been proposed as a means of broadening markets and increasing competition in the purchase of livestock. These markets seem to have brought beneficial results in lambs, hogs and other commodities where they have been tested. More widespread implementation of these markets might enhance competition for hogs and fed cattle. However, the very high levels of concentration of beef packers in the major cattle feeding areas raises questions about the effectiveness of electronic markets. If the same three firms dominate beef procurements in Iowa, Nebraska, Kansas, Colorado and Texas, an electronic market might do little to enhance competition. Still, it is an option worth exploring.

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EXHIBIT 5

Average Unweighted Four-Firm Concentration Ratios by Degree of Advertising Intensity, 65 U.S. Food and Tobacco Product Classes, 1958 to 1982.<sup>1</sup>

Year	(1)	(2)	(3)	(4)	(5)
	All Product Classes N=65	Producer Goods Product Classes (A/S=0) N=18	Consumer Goods Product Classes,		
			Low Advertising (A/S=0 to 1%) N=17	Medium Advertising (A/S=1 to 3%) N=16	High Advertising (A/S > 3%) N=14
1982	53.8%	50.2%	43.7%	58.9%	64.7%
1977	49.8	43.0	37.7	58.1	63.7
1972	48.8	42.9	37.8	56.1	61.1
1967	47.7	44.7	36.8	53.9	57.6
1963	47.1	44.8	36.1	52.1	57.7
1958	47.1	46.4	37.3	52.1	53.9
Change 1958-82	+6.7	+3.8	+6.4	+6.8	+10.8

Source: Bureau of Census, Census of Manufacturers for various years. Data tabulated by Richard T. Rogers, Department of Agricultural Economics, University of Massachusetts.

<sup>1</sup> These are product classes for which it was possible to make meaningful comparisons.

<sup>2</sup> The advertising-to-sales ratio (measured in percent) is constructed from each product class' advertising expenditures in eight measured media for 1967 and its 1967 value of shipments.

EXHIBIT 1

### National Four-Firm Concentration of Steer and Heifer Slaughter 1972 - 1987

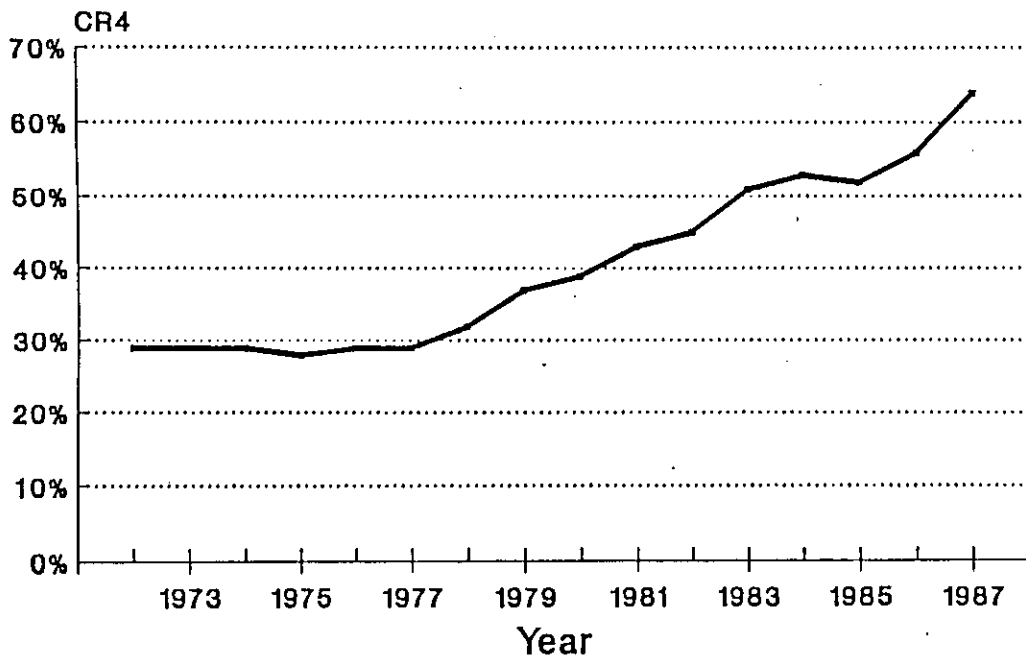


EXHIBIT 2

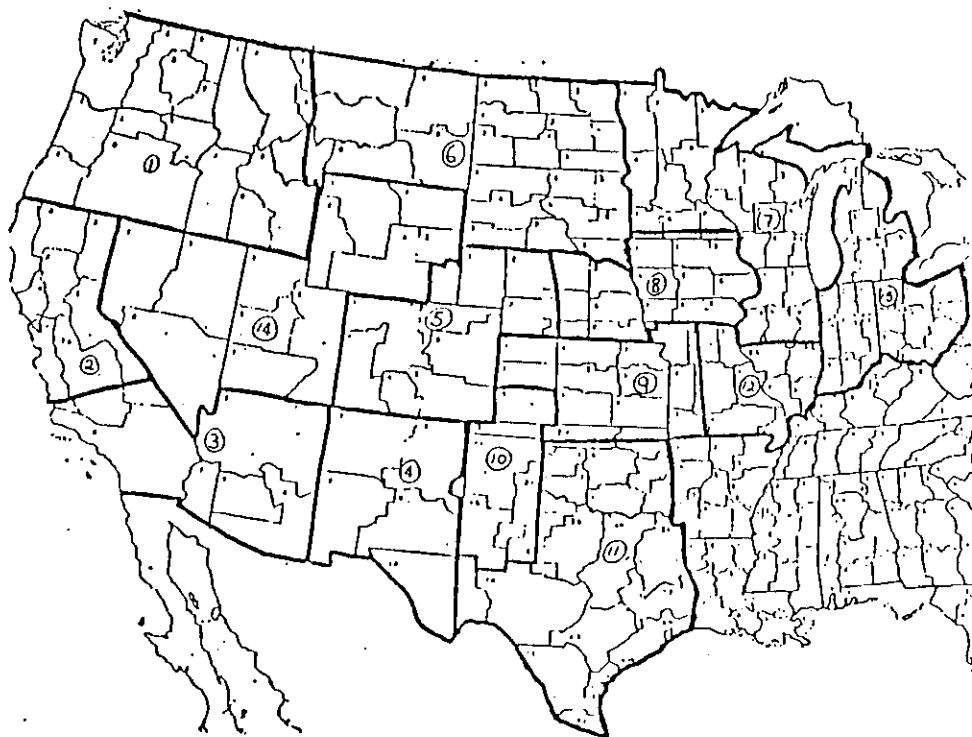


EXHIBIT 3

Four Firm Concentration Ratios  
Steer and Heifer Slaughter by Region  
1971, 1978, and 1986

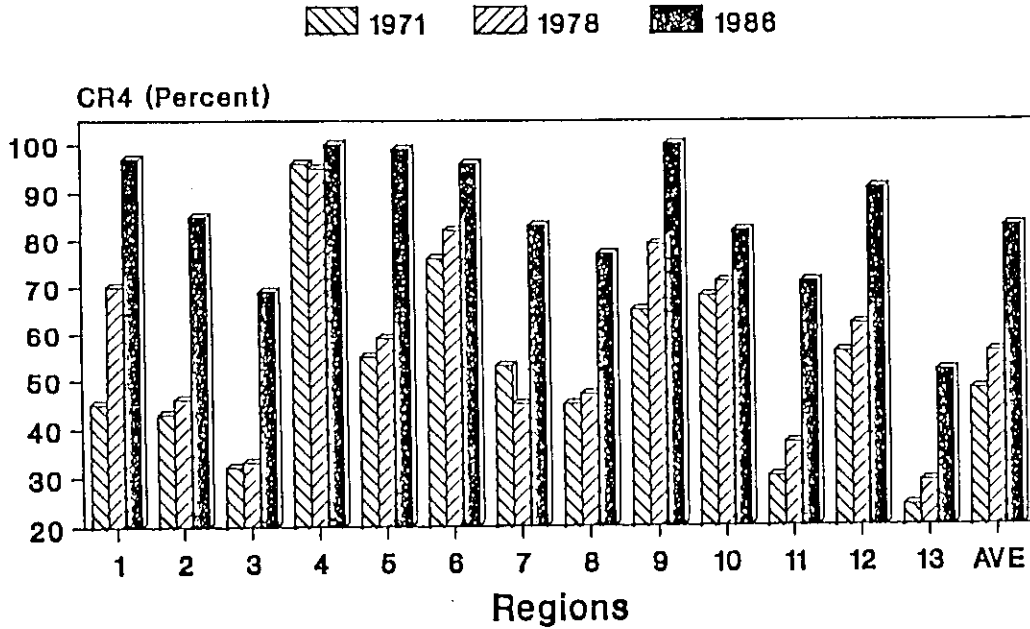


EXHIBIT 4

Average Four-Firm Concentration  
of Steer and Heifer Slaughter  
in 13 Regional Markets, 1971-1986

