

Special Article

Consolidation in Meatpacking: Causes & Concerns

The U.S. meatpacking industry consolidated rapidly in the last two decades, as today's leading firms built very large plants and many independent packers disappeared. Today, four firms handle nearly 80 percent of all steer and heifer slaughter; just two decades ago, concentration was less than half as high. Concentration in hog slaughter has also increased, although not to the same extent, and today four firms handle over half of all slaughter.

Meatpacking concentration raises important policy issues. If larger packers realize lower costs, then concentration, by reducing industry costs, can lead to improved prices for consumers and livestock producers. However, because they face fewer competitors, meatpackers could reduce prices paid to livestock producers, and they may be able to raise meat prices charged to wholesalers and retailers.

Based on a recent report by USDA's Economic Research Service (ERS), this article assesses the factors behind concentration by analyzing packing plant costs and examining several developments that have reduced slaughter costs and promoted industry consolidation.

The Path to Concentration & Consolidation

Recent concentration trends in meatpacking can be defined in terms of livestock procurement—the share of steers and heifers purchased by the four largest steer and heifer packers, and the share of slaughter hogs purchased by the four largest hog packers. These measures are known as four-firm concentration ratios, or CR4.

CR4 in steers and heifers is quite high—four firms account for nearly 80 percent of purchases, in contrast to the average CR4 of 40 percent across all U.S. manufacturing industries. Moreover, local market concentration may be higher, because slaughter cattle usually are not shipped far and many producers may see buyers from only two or three nearby packers. The other striking



feature of steer and heifer CR4 is the increase—from 36 percent in 1980 to 72 in 1990 and 78 in 1997. No other manufacturing industry shows as dramatic an increase since the U.S. Census Bureau began regularly publishing concentration data in 1947.

Hog slaughter is less concentrated—the top four hog packers handled 54 percent of slaughter in 1997. But CR4 in hog slaughter has increased sharply, from 32 percent just 12 years earlier. Like other livestock, hogs are not transported far to market, and as a result many producers may have more limited options locally, with a choice of buyers from only two or three packers.

Meatpacking has also shifted sharply toward larger plants that annually slaughter at least 1 million hogs or 500,000 steers and heifers. Such large plants, which handled less than a fourth of steer and heifer slaughter in 1980, accounted for over three-fourths just 15 years later. Large plants handled 63 percent of all hog slaughter in 1980, compared with 88 percent by 1997.

Shifts in plant size suggest that there may be economies of scale in slaughter, and that scale economies and the resultant shift to large plants may account in part for the increase in concentration. If there are scale economies, then increasing meatpacker concentration may lead to lower meat prices for consumers.

Costs & Plant Size in Meatpacking

Total plant costs include costs of purchasing livestock and expenses incurred in obtaining materials, capital, and labor to produce meat in slaughter plants. Because livestock prices can fluctuate sharply over short periods of time, analysts frequently distinguish between total costs and slaughter costs, which are the plant's costs exclusive of livestock purchase expenses.

Largest Meatpackers Captured a Growing Share of the Industry Since the 1980's

	1980	1985	1990	1995	1997
Share held by:	<i>Percent</i>				
Four largest firms					
Hogs	34	32	40	46	54
Steers and heifers	36	50	72	79	78
Large plants*					
Hogs	63	67	79	86	88
Steers and Heifers	24	53	66	81	80

*Large hog plants slaughter at least 1 million head annually; large steer and heifer plants slaughter at least 500,000 head.

Source: Grain Inspection, Packers and Stockyards Administration, USDA.

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Special Article

Meatpacking Costs Decline as Plant Size Increases

Size	Slaughter costs	Total costs
<i>1,000 head per year</i>		
——— <i>Cost index</i> ———		
Hogs:		
400	117.5	104.5
1,000	100.0	100.0
2,000	84.6	96.1
4,000	74.5	93.5
Cattle:		
175	130.7	104.3
425	100.0	100.0
850	85.0	97.9
1,350	78.6	97.0

For hogs, index value of costs is relative to costs at a 1-million-head plant; for cattle, a 425,000-head plant.

Data derived from Longitudinal Research Database, U.S. Census Bureau.

Economic Research Service, USDA

Plants can reduce average slaughter costs per head in three ways. First, some plants may be able to lower prices paid for production workers, energy, transportation, or packaging. Second, plants perform different operations; those that do less in-plant processing (e.g., ship whole carcasses instead of cut-up carcasses or retail packages) have lower costs. Third, plants may reorganize their processes to use inputs more intensively, thereby using fewer inputs per pound of meat produced.

Data for this analysis contain information on plant sizes, input prices, and product mix, which allow for identifying the separate effects of these different factors on plant costs. To ensure confidentiality regarding costs, index numbers for costs are reported, rather than dollars per head. This also allows for a focus on how costs vary as plant size changes, since dollar costs per head will vary up and down as input prices change from year to year, but scale relations (i.e., unit costs according to firm size) change more slowly.

For this article, data are reported separately for hog plants and cattle plants; for each plant type, indexes are reported based on per-head slaughter costs and per-head total costs (slaughter costs plus livestock purchase expenses). The cost indexes are based on the 1992 Census of Manufactures, when the industry's consolidation was completed.

Slaughter costs per head at a large hog plant (four million head per year) are more than 25 percent lower than costs per head at a mid-size plant (one million head), and nearly 40 percent lower than costs in a small commercial plant (400,000 head). For cattle, a large plant (1.35 million head) realizes slaughter costs per head that are over 20 percent lower than a plant slaughtering 425,000 head, and 40 percent lower than slaughter costs in a small commercial plant (175,000 head per year). Because the analysis accounts for varying input prices and levels of processing, cost differences reflect differing intensity of input use—larger plants realize substantial scale economies in slaughter because they are able to use labor, energy, materials, and equipment more intensively.

Costs discussed so far include slaughter costs only, exclusive of livestock purchase expenses. Livestock purchase expenses account for very large shares of total costs—90 percent of the total at large cattle plants and 80 percent at large hog plants. Because slaughter costs are a small part of total costs, large scale economies in slaughter should translate into small scale economies in total costs. This, in fact, is the case. Total costs per head at a 4-million-head hog plant are 6.5 percent lower than at a million-head plant, while the largest cattle plant realizes total costs of delivering meat to buyers that are only 3 percent below those at a 425,000-head plant, compared with slaughter cost differences of 25 and 20 percent, respectively.

Large plants had much smaller costs advantages over small plants in the 1970's. Large plant cost advantages widened noticeably after the early 1980's, for two reasons. First, scale economies related to intensity of input use expanded. The largest hog plant's relative cost advantage over smaller plants was about twice as large in 1992 as in 1982, and the largest cattle plant's 1992 cost advantage was half again larger than its 1982 index value. Scale economies grew more important with time.

Second, large plants in the 1970's and early 1980's faced an important input price disadvantage—they paid much higher wages than smaller plants. For example, in 1982, average hourly production worker wages at a 1-million-head hog slaughter plant in the western Corn Belt were about 10-12 percent higher than wages at a smaller western Corn Belt plant. Firms were not building 4-million-head plants then, but an estimated size-wage relation suggests that wages at those plants would have been another 15-18 percent higher than wages at the 1-million-head plant. (Similar but somewhat smaller effects existed at cattle plants.) In addition, there was a striking regional pattern—wages at southeastern hog slaughter plants were about one-third lower than in the western Corn Belt.

Labor relations in meatpacking have undergone key changes since the early 1980's when half the workers in the meat products industry were union members (meat products, in the broad survey that captures unionization data, includes red meat and poultry slaughter and processing). Most unionized workers belonged to the United Food and Commercial Workers union, whose base wage rate was \$10.69 an hour in 1982. In that year, many unionized firms began to press for large reductions in base

Meatpacking Industry Wage Differentials by Size and Region Have Declined

Plant characteristics		1972	1982	1992
Head/year	Location	<i>\$/hour</i>		
400,000	W. Corn Belt	5.04	12.17	8.08
1 million	W. Corn Belt	5.54	13.61	8.22
1 million	Southeast	3.64	9.15	7.81
4 million	W. Corn Belt	6.40	16.11	8.44

Estimated wages for production workers based on U.S. Census Bureau's Longitudinal Research Database.

Economic Research Service, USDA

wages, to \$8.25 an hour, consistent with what was being offered in non-union plants. Between 1983 and 1986, 158 work stoppages involving 40,000 workers occurred in cattle and hog slaughter plants, followed by widespread plant closings and deunionization.

By 1987, union membership in meatpacking had fallen to a fifth of the workforce, where it has remained. Average wages fell sharply at slaughter plants of all sizes after 1982, and regional and size differentials virtually disappeared (in fact, preliminary 1997 data show no size or regional differentials).

The 1982 wage differential had provided a 1-million-head hog plant with a slaughter cost advantage of 6 percent per head over a 4-million-head plant (assuming that production worker pay accounts for one-third of slaughter costs), and provided a 400,000-head plant with a 10-percent cost advantage over the largest plant, thereby attenuating large plants' advantages in the intensity of input use. After 1982, disappearing wage differentials reinforced expanding scale economies to provide large plants with substantial slaughter cost advantages.

Did Packers Pass On Scale Economy Gains?

As larger plants realized lower slaughter costs in the 1980's and 1990's, production shifted rapidly toward them. As a result, industry-wide average meatpacking costs fell, and the industry (particularly steer and heifer slaughter) became far more concentrated as a small number of firms each operated several very large plants. In highly competitive industries, cost declines should be quickly passed through, either as lower prices to buyers or as higher prices paid to livestock producers. But in an industry that has become highly concentrated, large firms may be able to retain the cost advantage as profits.

ERS data on farm-to-wholesale price spreads for Choice beef provide some evidence on the effects of the industry's consolidation (beef is examined here because of the striking CR4 increase). Price spread is the dollar difference between what packers receive for beef and the price they pay for animals; it includes costs of slaughter, transportation expenses for moving animals from feedlot to packing plant, and packer profits.

Slaughter and transportation costs reflect the prices and quantities of inputs used in those functions. Because the price spread is deflated with an index of packer input prices, the resulting real spread measures changes in packer profits and input quantities per retail pound of beef, holding input prices constant. The data are expressed as annual averages of cents per retail pound, which smooths the sharp fluctuations in monthly data.

Real spreads fell in the 1970's, reflecting meatpacking productivity growth. The trend continued during the period of rapid concentration increase, through 1992, as cost declines realized through scale economies were passed through to meat buyers and livestock producers. From 1993 to 1998, spreads fluctuated much more widely, but showed no long-term increase. The pic-

Data Sources

Data on concentration and large plant livestock purchases are gathered in annual surveys of meatpackers carried out by USDA's Grain Inspection, Packers and Stockyards Administration (GIPSA).

The primary data source for the analyses of plant costs is the U.S. Census Bureau's Longitudinal Research Database (LRD). The LRD details the records of individual establishments reported in the Census of Manufactures. Since 1967, the Economic Censuses have been taken in every year ending in "2" or "7" (the most recent data available for this study was from the 1992 Census; data from the 1997 Census are not yet available for use in the LRD).

The file also includes establishment records from a census taken in 1963. The data provide detailed information on the mix of products, quantities and prices of material inputs, employment and average wages, and ownership and location for each establishment.

Because the LRD contains data on individual plants over several censuses, researchers can make comparisons across plants at a point in time, and can also trace changes in product and input mixes, costs, and concentration over time. While researchers have access to individual establishment records for research purposes, they may not divulge information on any individual plant or firm, and may only publish aggregated information.

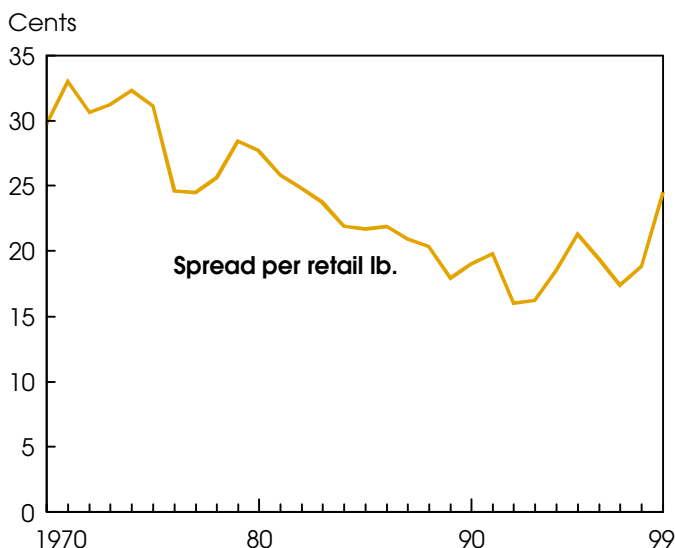
ture tells a strong story: if large increases in concentration had important effects on packer pricing and profits, they don't show up in the price-spread statistics. Sufficient competition apparently prevailed, such that packer cost declines were passed on to consumers or producers.

Although spreads fell while the industry concentrated, there has been a noticeable increase in the real farm-to-wholesale spread at the end of the period, a rise of 40 percent in 1997-99. To put the change in context, the packers' spread rose by 9.4 cents per retail pound of beef during 1997-99 (in nominal terms; the real spread rose by 7.1 cents per pound since input prices rose 2.3 cents). During the period, average retail prices for choice beef rose from \$2.80 to \$2.94 a pound and cattle producers' prices increased from \$1.37 to \$1.47 per retail pound. The spread's increase should largely reflect higher packer profits since there's no evidence of productivity deterioration.

Short-term spikes in the farm-to-wholesale spread have occurred before, but previous sharp increases in 1980, 1991, and 1995 didn't last long. Short-term fluctuations usually result from sharp changes in livestock supplies or meat demand, and the spikes quickly fell as packers, buyers, and producers adjusted. Such spikes don't necessarily indicate any significant change in the nature of competition in an industry.

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Farm-Wholesale Price Spread for Beef Fell During Consolidation but Ticked Up in the Late 1990's



Choice beef. Inflation-adjusted 1982 dollars.
Economic Research Service, USDA

Nevertheless, a long-term increase would be troubling. Increasing concentration in other sectors of the economy has often reflected intense competition and frequently led to falling costs and prices for the concentrating firms. But after an industry consolidates, when few firms face each other in a stable environment, competition may often become less intense.

Following the emergence of new and extensive scale economies in meatpacking, intense price competition led to the exit of high-cost smaller plants, their rapid replacement by larger and more efficient plants, and significant increases in concentration and reductions in costs. As consolidation is completed, will packers successfully limit price competition among themselves and maintain 1999's high spreads? Or will they continue to compete aggressively, thereby ensuring that cost reductions in meatpacking are passed through?

Spreads have remained high through the first quarter of 2000, and the coming months will tell whether the spike is short-term, to be eroded by continuing competition. The policy challenge for the future is to ensure that a highly concentrated industry—a result of consolidation—does not limit price competition among packers. **AO**

James M. MacDonald (202) 694-5391 and Michael E. Ollinger (202) 694-5454

macdonal@ers.usda.gov

ollinger@ers.usda.gov

For more information, see *Consolidation in U.S. Meatpacking*, Agricultural Economics Report No. 785, February, 2000. Access on the ERS website at: www.ers.usda.gov/epubs/pdf/aer785/index.htm. Printed copies may be purchased by calling 1 (800) 999-6779.

Upcoming Reports—USDA's Economic Research Service

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July

- 12 *World Agricultural Supply & Demand (8:30 am)*
- 13 *Cotton & Wool Outlook (4 pm)***
*Oil Crops Outlook (4 pm)***
*Rice Outlook (4 pm)***
- 14 *Feed Outlook (9 am)***
*Wheat Outlook (9 am)***
- 20 *Agricultural Outlook**
- 26 *U.S. Agricultural Trade Update (3 pm)*
*Livestock, Dairy & Poultry (4 pm)***
- 27 *Vegetables & Specialties Yearbook**

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