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ECONOMIC SURVEY OF SMALL  
SLAUGHTERING PLANTS  
IN MISSOURI

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## SUMMARY

The survey covered the population of non-federally inspected wholesale slaughterers and a sample of 48 custom slaughterers. Personal interviews of management were conducted from January to April, 1956. Data were largely based upon operations during the 1955 calendar year.

Wholesale packers varied considerably in volume of slaughter. Fifty percent of the total hog slaughter and 75 percent of the total cattle slaughter were in 16 plants located in St. Louis, Springfield, and Cape Girardeau. Cattle slaughter by plants ranged from 500 head to a little more than 30,000 head while hog slaughter ranged from nothing in 10 plants to a little more than 30,000 head, in 1955.

All grades except Prime were well represented in cattle slaughter. However, average live weights of cattle were about 200 pounds smaller than the state average for 1955. Average live weights of hogs were slightly smaller than the state average.

Plants bought approximately 82 percent of the cattle and 47 percent of the hogs from public stockyards and approximately 13 percent of the cattle and 46 percent of the hogs directly from the farm.

Considerable variation was found among plants in labor efficiency of slaughtering and in wage rates. Several low efficiency plants paid some of the highest wage rates so labor costs of slaughtering varied widely.

In general, accounting systems appeared far too elementary to provide managers with sufficient knowledge of costs and revenues to maximize profits in a multiple product industry like meat packing. The wide variations in handling and in sales receipts for by-products are probably indicative of the variation in management's attention to economic alternatives.

Generally, the firms anticipated expansion in the next five years and stated that plants and livestock sources would permit expansion readily. Several plants used federal grading and several more anticipated using it. Lack of an adequate state inspection system was considered by several progressive packers to be disadvantageous.

There was considerable non-price competition. However, only 22 of the 40 firms used brand names. Advertising expenditures in 1955 varied from nothing to \$42,000. Almost all output was sold direct to retailers.

Custom slaughtering was typically a part-time business. A locker plant was a supplementary operation for 27 of the 46 custom slaughterers sampled. Hog kills ranged from 75 to 1500. Cattle kills ranged from nothing in three firms to 1000. Plants were small and scantily equipped. Most firms had only one employee. Sanitation measures, slaughtering methods, and processing charges varied considerably.

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Report on Department of Agricultural Economics Research

Project 150, "Marketing Meat in Missouri"

# ECONOMIC SURVEY OF SMALL SLAUGHTERING PLANTS IN MISSOURI

This study sought economic information about the characteristics, operations, and problems of non-federally inspected slaughterers in Missouri. Both wholesale slaughterers and custom slaughterers were studied.

Missouri had 54 wholesale slaughterers in 1955 who slaughtered 300,000 pounds or more of livestock. Approximately 86 percent of the total slaughter was in 13 federally inspected plants. About 11 percent, or 198 million pounds live weight, was slaughtered in 41 non-federally inspected plants and almost 3 percent, or about 52 million pounds, was slaughtered by smaller custom operators.<sup>1</sup>

## PART I NON-FEDERALLY INSPECTED WHOLESALE SLAUGHTERERS

A list of all non-federally inspected wholesale slaughterers in Missouri was obtained from the state statistician of the United States Department of Agriculture. Managers of all but one firm cooperated by granting interviews.

### General Characteristics

**Location and Size of Plants:** Sixteen of the 40 plants, 75 percent of the total cattle slaughter, and 50 percent of total hog slaughter were located in St. Louis, Springfield, and Cape Girardeau (Table 1). The eight largest plants, each of which slaughtered more than 8,000,000 pounds of livestock in 1955, were located in these areas (Figure 1). Several classifications will be given for these three areas because of their importance and because each area had sufficient plants to prevent the revelation of an individual firm's operations.

<sup>1</sup>*Livestock and Meat Situation*, July 8, 1955. Twenty "local" and 26 "wholesale" non-federally inspected packers and 13 federally inspected packers were reported operating in Missouri. "Local" packers slaughter 300,000 to 2,000,000 pounds annually while "wholesale" packers slaughter more. However, "wholesale" refers to any plant slaughtering over 300,000 in this study. Only 41 wholesale, non-federally inspected plants could be located rather than 46. Total slaughter in Missouri was 1,847 million pounds, live weight, of cattle and hogs in 1955 ("Livestock Slaughter and Meat Production," USDA Crop Reporting Board, January 31, 1956).

TABLE 1. PERCENTAGES OF SLAUGHTER OF NON-FEDERALLY INSPECTED MEAT PACKERS BY AREAS IN MISSOURI; 1955.

Area	Cattle	Hogs
St. Louis	49.0%	3.8%
Springfield	21.7	25.7
Cape Girardeau	5.5	20.5
Other Areas	23.8	50.0
	100.0	100.0

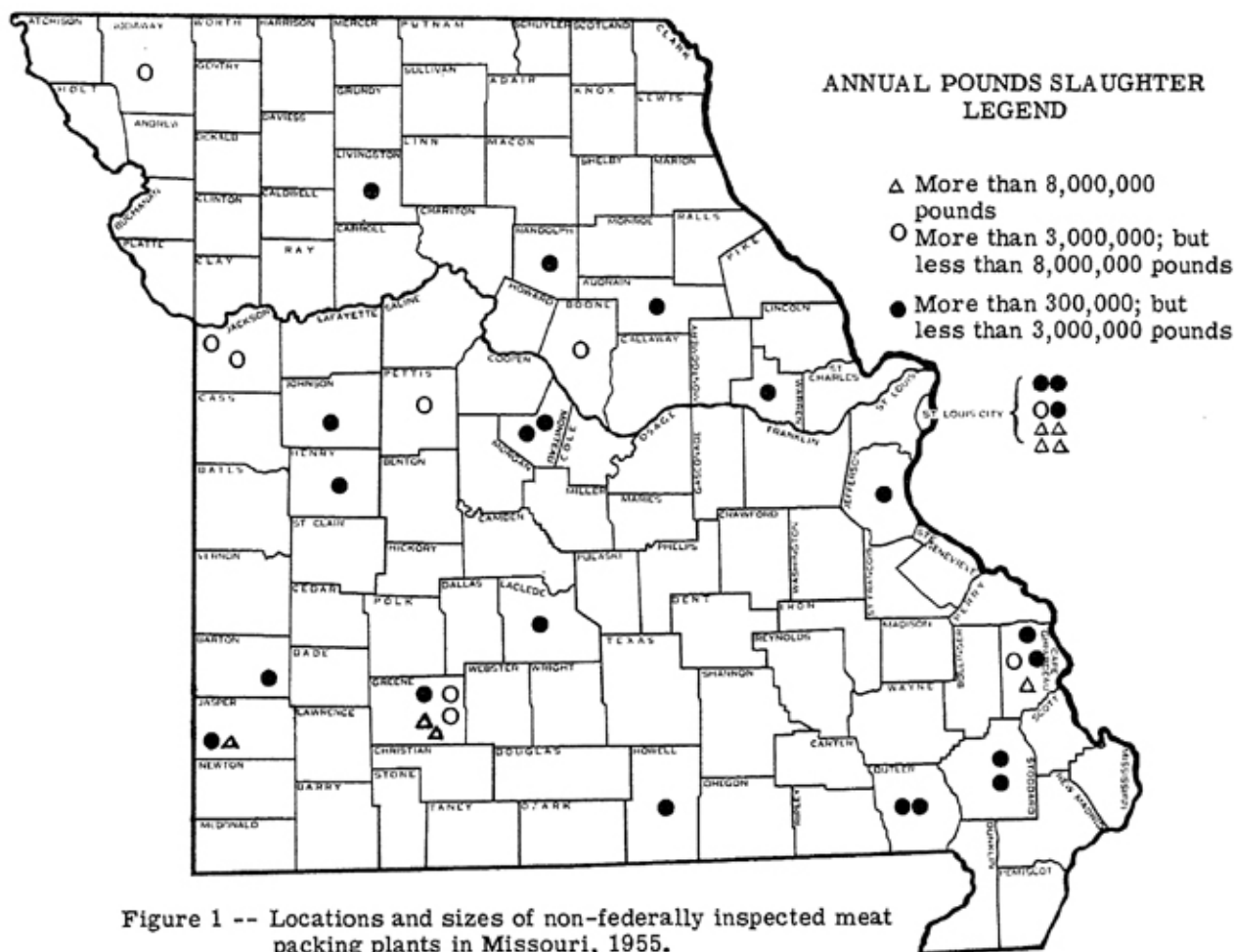


Figure 1 -- Locations and sizes of non-federally inspected meat packing plants in Missouri, 1955.

**Ownership:** Of the various types of ownership, the corporate type was predominant with 19 plants. Next in prevalence was the single proprietorship, found in 11 plants; partnerships ranked third with nine plants. One plant was a cooperative. The trend since 1954 has been toward the corporate ownership of these plants. Of 24 plants that changed hands or began operations after 1945, eleven were organized under a corporate structure, seven under a single proprietorship, five partnerships, and one under a cooperative business structure. All of the plants in this study that

were corporations were locally owned corporations, and all but one were family owned.

**Age of Plants:** The oldest plant was 50 years old and the newest, three. The average age of all non-federally inspected meat packing plants was 20. Classifying the plants according to average age gives the following age distribution by areas.

St. Louis Area	33 years
Springfield Area	22 years
Cape Girardeau Area	20 years
Joplin Area	18 years
All Other Areas	14 years

Most of the packers studied had made additions to and/or attempts at modernization of their existing plants. Because of the large amount of capital required to build a new plant, these were largely expedient measures designed to maintain and expand operations. Many of the plant managers recognized that completely new plants would have to be built in the near future to permit efficient operations under approved sanitary conditions.

**Inspection Service:** Consumers expect clean, wholesome meat. To assure consumers that their meat supplies have these qualities, inspection services have been provided by various federal, state, and city agencies for the purpose of inspecting, among other things, health of animals slaughtered and sanitation practices of plants.

#### *Federal Inspection*

Products, to be eligible for federal grading, must be prepared either under federal inspection or other official inspection acceptable to the federal grading administration.

In this study, the 12 firms that used federal grading were subject to local city inspections that were acceptable to the federal government. Therefore, the federal government did a minimum of inspection which included irregular surveys of the sanitation and inspection maintained by plants under official city inspections. The frequency of a federal inspector's visits to the 12 plants was from three to four times yearly.

#### *State Inspection*

The State of Missouri had no adequate inspection system for meat packing plants. Inspection of slaughtering and processing operations of meat packers was the responsibility of the Food and Drug Bureau of the Division of Health. The Food and Drug Bureau had 12 men in the field, working in six districts, with 22 different programs to administer. Inspec-

tion of sewage and water facilities of the meat packing plants was the responsibility of the Bureau of Public Health Engineers of Missouri.

The frequency with which these two agencies were able to inspect the various plants was from one to eight times yearly. This was inadequate because there were a few firms in the state that apparently needed much closer supervision to maintain a satisfactory level of sanitation. No definite statutory requirements are set forth for inspecting non-federally inspected meat packing plants. Further, managers believed that the "suggested" requirements set forth by the Food and Drug Bureau were vague. A common complaint of the management of the more sanitary packing firms was that the state's inspection system was inadequate and that a more comprehensive service was needed to "clean up" the industry.

### *City Inspection*

There were 27 firms subject to city inspection. Springfield, Kansas City, and St. Louis had city inspection that was closely comparable to the standards of federal inspection. All of the city inspection systems were reported to be superior to the state system. With the exception of packers operating in St. Louis and Kansas City, the packers paid for city inspection. Average cost per packer was 250 dollars per month.

It might seem reasonable to discontinue any state attempt at meat packing inspection and leave it entirely in the hands of the various cities. A problem arises, however, in that packing firms in some towns are not of sufficient size to support a city inspection service. An inspection service requires a graduate veterinarian in at least a supervisory capacity.

Another problem was found in connection with city inspection. It was used occasionally as a trade barrier. At the time of this survey, some cities refused to accept a neighboring city's inspection of meat. Perhaps in some instances there was good reason for this, but it appeared to be more of a technique for barring competition than for upholding sanitation.

**Federal Meat Grading Services:** Even though a meat packing plant does not have federal inspection, which prevents it from doing inter-state trade, the plant may qualify for federal grading service by fulfilling certain minimum requirements. Twelve of the plants had federal grading in 1955. They were located in St. Louis (seven plants), Springfield (one plant), Joplin (one plant), Cape Girardeau (one plant), Columbia (one plant), and Raytown (one plant).

### **Sources of and Buying Practices for Livestock**

**Sources of Livestock:** Sources of supply from which packing plants obtained livestock were of four different types: (1) public stockyards; (2)

public auctions; (3) local dealers; and (4) direct from farmers. Percentages bought from each of these sources varied greatly between cattle and hogs (Table 2). The greatest variations between sources of supply for cattle and

TABLE 2. SOURCES OF LIVESTOCK SUPPLY FOR NON-FEDERALLY INSPECTED PACKING PLANTS IN MISSOURI; 1955.

Sources of Supply	Cattle		Hogs	
	Number	Percent	Number	Percent
Public Stockyards	162,464	81.67	104,828	47.36
Public Auctions	8,713	4.38	925	.42
Local Dealers	2,307	1.16	13,042	5.90
Direct from the Farm	25,443	12.79	102,526	46.32
Totals	198,927	100.0	221,344	100.0

hogs were in the percentages bought from public stockyards and direct from the farm. Packers in the heavily populated areas such as St. Louis, Raytown, and Springfield did not buy many hogs direct from the farm because of the proximity of the plants to public stockyards.

The percentage of hogs bought direct from the farm by 23 plants, excluding plants located within a 25-mile radius of a public stockyards, was approximately 87, compared with 46 for all plants in the population. Public stockyards were virtually the only source of hogs for the St. Louis and Springfield areas. However, Cape Girardeau firms obtained most of their hogs directly from farmers (Table 3).

TABLE 3. PERCENTAGES OF HOGS AND CATTLE OBTAINED FROM VARIOUS SOURCES BY NON-FEDERALLY INSPECTED PACKING PLANTS IN ST. LOUIS, SPRINGFIELD, AND CAPE GIRARDEAU; 1955.

Source	St. Louis		Springfield		Cape Girardeau	
	Hogs	Cattle	Hogs	Cattle	Hogs	Cattle
Public Stockyards	96.5%	99.2%	94.7%	99.7%	3.6%	37.6%
Public Auctions	0.0	0.0	0.0	0.0	0.0	0.0
Local Dealers	3.5	0.8	0.0	0.0	10.3	1.6
Direct from the Farm	0.0	0.0	5.3	0.3	86.1	60.8

Firms in 14 of the other 19 plant areas purchased no hogs from public stockyards. Firms in three of the areas purchased some hogs from public auctions. Likewise, firms in three of the areas purchased some hogs from local dealers. In only three of the 22 areas did firms fail to buy any hogs directly from farmers.

Cattle sources presented a pattern of purchases almost opposite to that of hogs. Public stockyards were the predominant source of cattle supply, with the number purchased direct from the farm being next in importance. Excluding plants within a 25-mile radius of a public stockyards, the 23 remaining plants purchased approximately 18 percent of their cattle from



public stockyards, compared with nearly 82 percent for all plants in the population. Purchases direct from the farm by the 23 plants accounted for most of this difference. In the central and northwest sections of Missouri, public auctions were a fairly important source of supply for cattle. Public auctions were a more important source of cattle than of hogs. Firms in nine areas purchased cattle from auctions and three of these firms purchased one-half or more of their supplies from auctions.

**Buying Practices:** When firms bought livestock direct from the farm, they used public stockyards market quotations as guides for pricing. Transportation costs, commission charges, etc. were subtracted from the prices paid for livestock of specified grades and weights on the public market serving the area. Offers of the buyer of the local packing plant were thus presumed to be net farm prices. Whether or not prices actually paid were net farm prices for the particular class, weight and grade depended on the relative skill in bargaining between the buyer and the livestock feeder.

The common practice for hogs, for example, was to pay a certain amount below a public market top price quotation for barrows and gilts for that day. The most common figure used was 50 cents below the top. The lowest figure used by the packers in this study was 25 cents below the top. This deduction from quoted top prices on the major market was presumed to represent transportation and marketing charges.

The smallest packing firms that bought a large percentage of their livestock direct from the farm tended to purchase from a particular group of producers. This method enabled the packing firms to have a fairly accurate idea of how much livestock would be available for slaughter during a certain period of time.

The largest packing firms that bought a high percentage of their livestock from public stockyards purchased livestock in much the same manner as the national packers. If the firm was located near the public stockyards, it sent a buyer to the stockyards to make the day's purchases. If the firm was some distance from a public stockyards, an order buyer on the market was contacted, usually by phone, and an order placed for the kind and amount of livestock desired.

A few packing firms obtained part of their livestock supply from local dealers. The local dealer merely concentrated some livestock at a central point and then made his trade with the packer buyer. Public auctions were utilized by some firms as sources, although this method of purchasing livestock was of relatively minor importance for the industry in the state as a whole.

## Slaughtering Operations

**Volume by Weights and Grades:** Of the 40 firms, 39 slaughtered cattle and 30 slaughtered hogs. One firm slaughtered over 2,000 sheep and one other slaughtered a few sheep.

Cattle slaughter by the 39 firms slaughtering cattle ranged from 500 to a little over 30,000 head in 1955. Only six firms slaughtered more than 10,000 head of cattle while 20 firms each slaughtered 2,000 head or less.

Good and Choice grades of cattle comprised about two-thirds of the total slaughter (Table 4).<sup>2</sup> Most firms reported no Prime grade cattle slaughtered. Three firms reported nothing more finished than Good grade in their slaughter lists while one of these firms slaughtered only Commercial or below. Five firms slaughtered Good or above. The grade breakdown is shown for St. Louis, Cape Girardeau, and Springfield areas in Figure 2.

**TABLE 4. NUMBERS AND PERCENTAGES OF GRADES OF CATTLE SLAUGHTERED BY 39 PACKERS; 1955.**

	Grade				Total
	Prime	Choice	Good	Commercial and Below	
Number of Head	100	62,554	80,594	55,679	198,927
Percent of Total	.005	31.45	40.55	27.99	100.0

The range in average weights of cattle slaughtered in each of the 39 plants was from 550 to 900 pounds live weight. Average live weight per head of all cattle slaughtered in 39 plants was 711 pounds.<sup>3</sup> Approximately 141 million pounds of cattle were slaughtered in 1955 in these 39 plants.

Hog slaughter by the 30 firms slaughtering hogs ranged from 187 to a little over 30,000 head in 1955. Only seven firms slaughtered more than 10,000 head while 18 firms slaughtered 5,000 head or less.

More than half the total number of hogs slaughtered were in the 180 to 220-pound weight range. The 30 firms bought the largest percentage of hogs on the basis of live weight classes.

The range in average weights of hogs slaughtered in each of the 30 plants was from 200 to 500 pounds live weight (Table 5). Average weight per head of all hogs slaughtered in these plants was 228 pounds live weight.<sup>4</sup> Total hog slaughter for all plants in 1955 was approximately 50 million pounds (Figure 3).

<sup>2</sup>Numbers by grade and weight are based on estimates of the managers.

<sup>3</sup>The state average for 1955 was 917.6 pounds. "Livestock Slaughter and Meat Production," USDA Crop Reporting Board, January 31, 1956.

<sup>4</sup>The state average for 1955 was 240 pounds. *Ibid.*

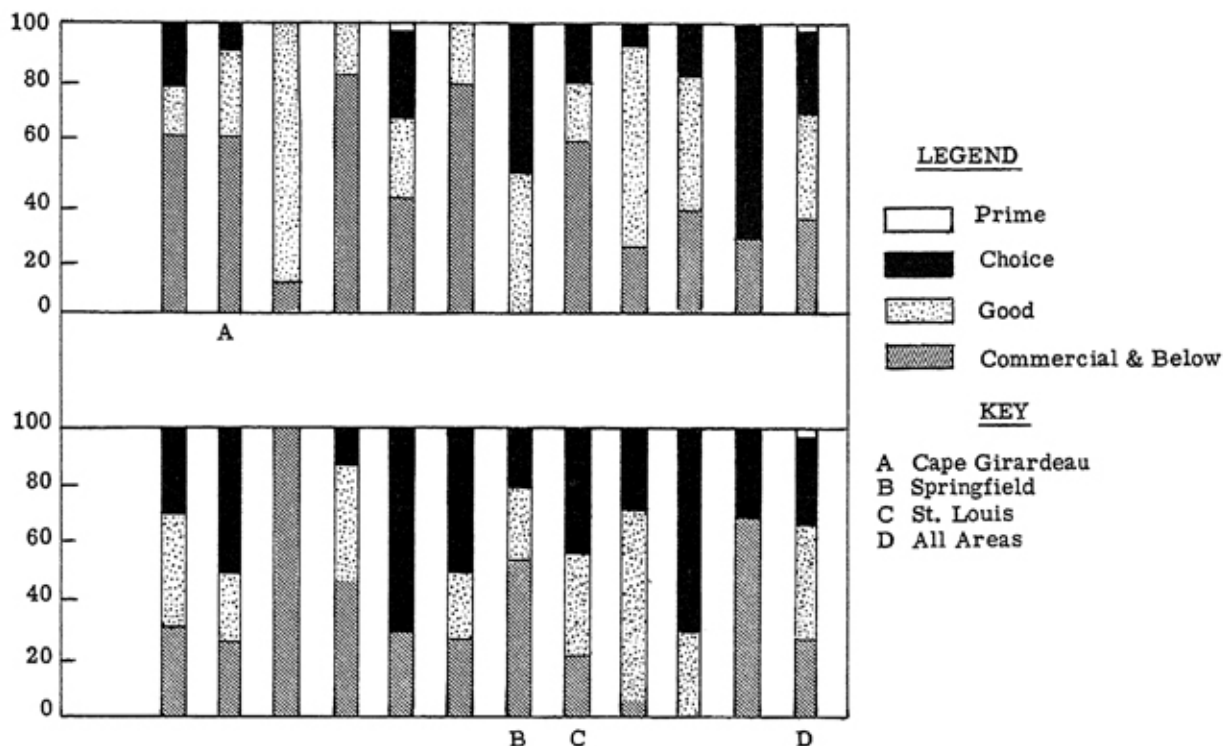


Figure 2 -- Grades and percentage of each grade of cattle slaughtered in each plant area and a summation of all areas, 1955.

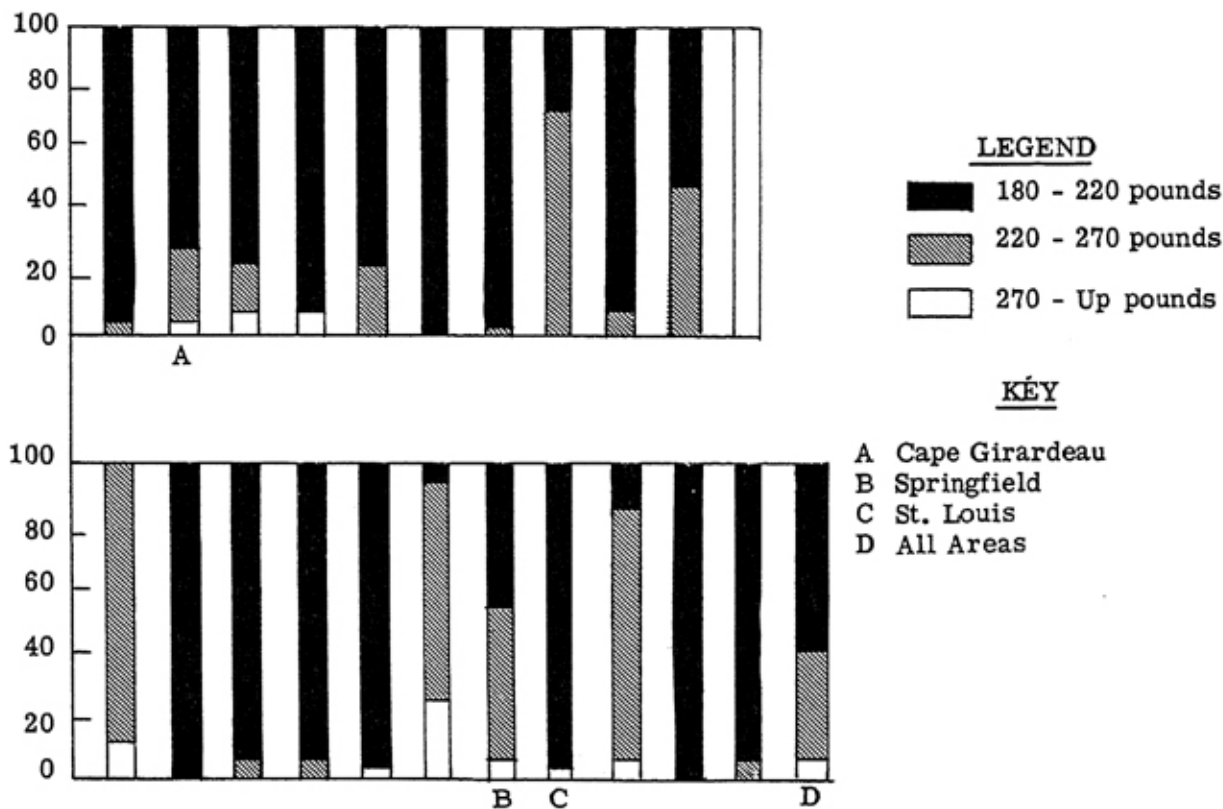


Figure 3 - Weight classes and percentage of each weight class of hogs slaughtered in each plant area, and a summation of all areas, 1955.

TABLE 5. NUMBERS AND PERCENTAGES OF VARIOUS WEIGHT CLASSES OF HOGS SLAUGHTERED BY 30 PACKERS; 1955.

	Weight			Total
	180-220	220-270	270-up	
Number of Head	130,304	75,056	15,984	221,344
Percent of Total	58.87	33.91	7.22	100.0

**Labor Utilization and Labor Costs:** Labor and costs of labor were considered briefly because these are an important part of a meat packing enterprises. In this study labor costs were approximately 55 to 60 percent of the gross margin. Wage rates varied by firms but a more significant difference was found between geographical areas. Table 6 shows wage rates

TABLE 6. AVERAGE HOURLY WAGE RATES IN SEVEN GEOGRAPHICAL AREAS; 1955.

Area	Number of Plants	Hourly Killing Floor Wage Rate	Hourly Processing Wage Rate
St. Louis	8	\$2.58	\$2.44
Kansas City	2	2.03	2.03
Joplin	2	1.75	1.60
Springfield	5	1.46	1.25
Cape Girardeau	3	1.42	1.38
North Missouri*	6	1.28	1.39
South Missouri**	14	1.18	1.23

\*Area north of the Missouri River (outside named areas)

\*\*Area south of the Missouri River (outside named areas)

paid in seven geographical areas. Firms in the St. Louis area paid a much higher hourly wage rate for both killing floor and processing labor than those in any of the other areas. Killing floor wage rates in the St. Louis area were 11 percent higher than in the Kansas City area, 33 percent higher than in the Joplin area, 43 percent higher than in the Springfield area, 45 percent higher than in the Cape Girardeau area, 50 percent higher than in the North Missouri area, and 54 percent higher than in the South Missouri area.

Workers in one-half of the plants were under union contract; in those 20 plants, the hourly wage rate for processing labor was equal to or lower than the hourly wage rate for killing floor labor. This is explained in part by the fact that processing labor was somewhat easier to obtain in large metropolitan areas where the 20 unionized plants were located than in smaller communities. The reverse was true of killing floor labor. The mean wage level for all plants was \$1.60 per hour for killing floor labor and \$1.61 per hour for processing labor. Of 193 men hired as killing floor laborers in the 40 plants, 131 or 68 percent of them belonged to a union.

Union agreements varied little in flexibility in labor use between plants in the same areas, but there was great variation in agreements in different geographical areas.

These packers provided stable employment. There was almost no part-time employment. Most employees had a guaranteed work week of 36 hours or more. However one firm only assured employment to the office worker, foreman, and salesman; seven firms did not guarantee a minimum work week; and one firm did not reveal its policy. However, even these nine firms operated at a quite even rate throughout the year.

**Equipment and Labor Utilization:** There was great variation in the size of killing floors found in the 40 packing plants. The smallest killing floor contained 360 square feet and the largest had 6000 square feet; average size was 1603 square feet. The median size of killing floors was 1152 square feet, or a floor area approximately 34 feet square.

A small packing plant has much less specialization by specific jobs than a large packing plant. Consequently, there was some interchanging of jobs in the smaller plants in order to fully utilize labor. Even with this interchanging of jobs, a certain number of men were usually designated and paid as killing floor labor.

There was much variation in the number of men hired for the killing floor due to volume of livestock handled, size of facilities, amount of machinery, degree of skill of the labor, and nature of the union agreements. The range in number of men hired for killing floors in the 40 plants was from one to 22, with the total number of killing floor employees in 40 plants being 193. This gave a mean of nearly five men per plant. The median was four men per plant.

No attempt was made to study the degree of mechanization of the plants nor the efficiency of their layouts in detail. However, general observation at the plants and preliminary results of an efficiency study at one of the plants indicate considerable variations in mechanization and efficiency of operation. The following observations concerning equipment and the efficiency of labor probably point out the general problem though the observations may not be complete in detail.

There was considerable variation in the size and kind of equipment used in the 40 plants. All plants where hogs were slaughtered had dehairing machines, but the size and capacity of the machines differed greatly. Arthur Cushman, in an article in *The Packing Industry*, stated that the dehairing machine was:

“. . . the most important machine in any of the major departments of the entire plant, exclusive . . . of motive power and refrigeration.”<sup>5</sup>

<sup>5</sup>Quoted in William H. Nicholls, *Labor Productivity Functions in Meat Packing* (Chicago: University of Chicago Press, 1948), p. 33.

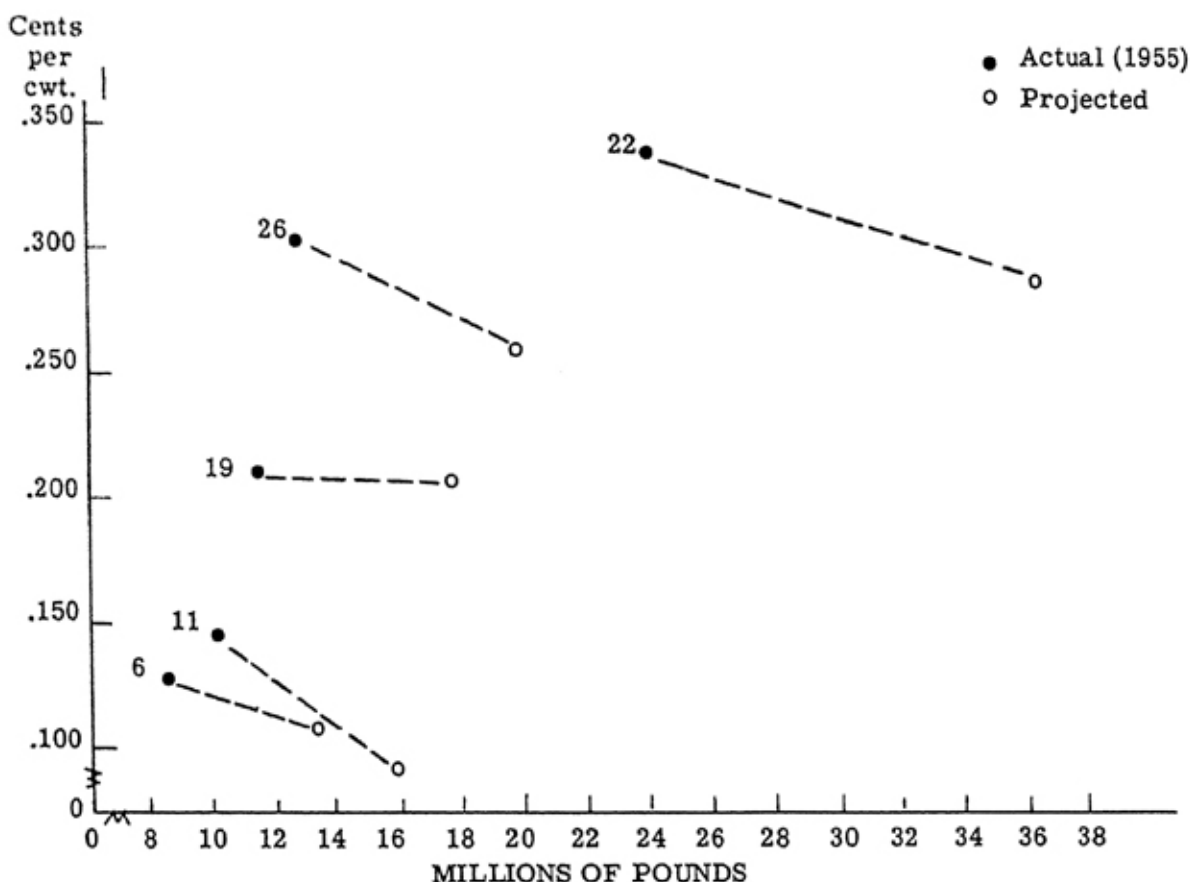


Figure 4 -- Killing floor labor cost of cattle slaughter in plants with annual volume of more than 8,000,000 pounds, and projected cost with 50 percent increase in volume.

The larger plants usually had such modern equipment as electric chain hoists and electric saws, while some of those not as well equipped relied on hand hoists and hand saws.

There was also wide divergence among the physical layouts of the plants. For example, in some plants the position of the first cutting table in relation to that of the dehairing machine was determined by the positions of inside walls and the angles at which tracks could be fitted. Many of these plants were constructed before plans were made to include dehairing machines in the plant layout.

There was much variation among plants in labor costs on the killing floor. An approximation was made of the comparative costs of killing floor labor for cattle in the 39 plants that slaughtered cattle.<sup>6</sup> To obtain an estimate of the position of each plant on its individual average cost curve for killing floor labor, the plant managers were asked how much labor they would have to hire in order to kill 50 percent more cattle or hogs

<sup>6</sup>The formula used to determine the labor cost per 100 pounds of cattle slaughtered was:

$$\frac{\text{Pounds of cattle slaughtered per man hour}}{\text{Wages paid per man hour}} = \frac{\text{Cost of labor per 100 pounds}}{100}$$

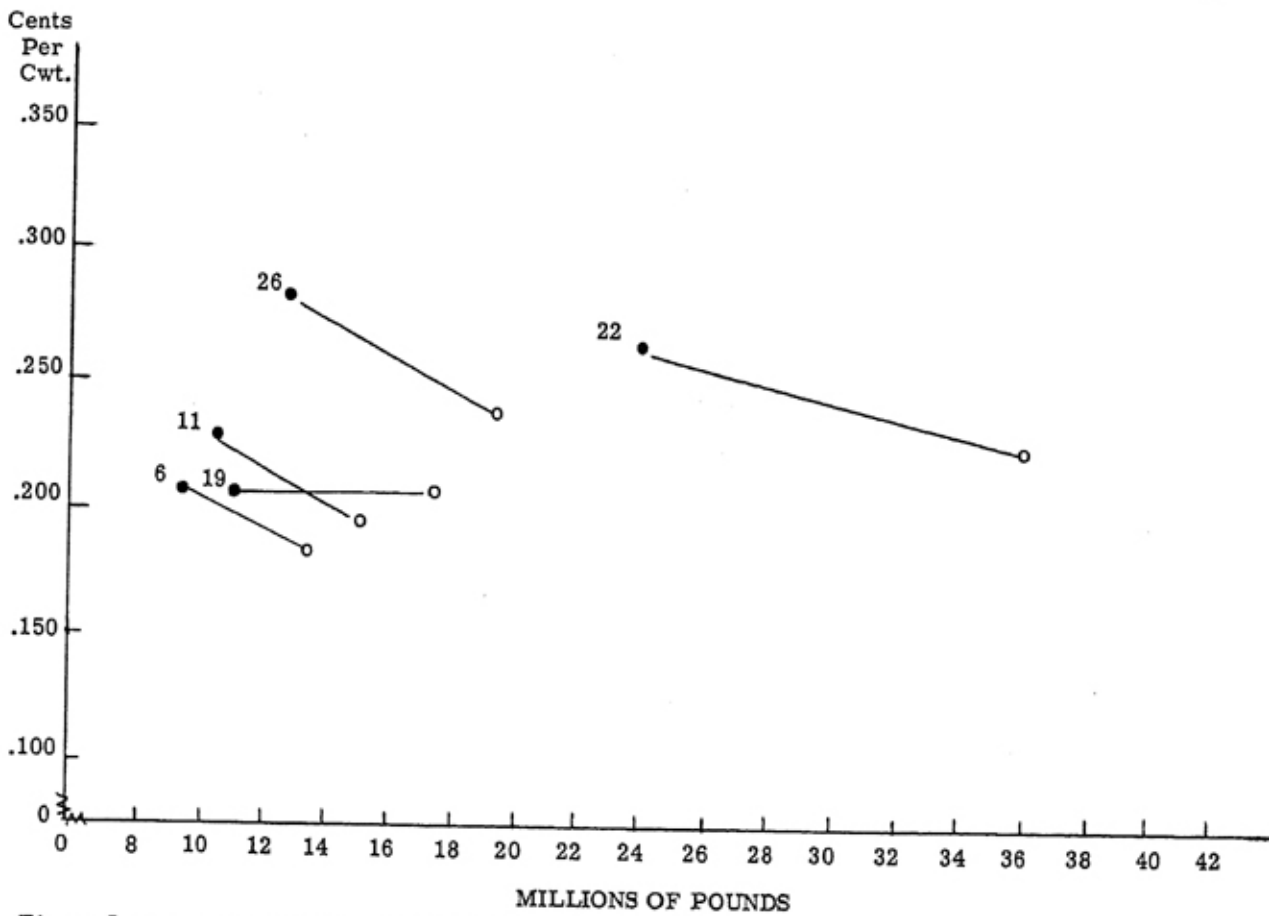


Figure 5 -- Figure 4 adjusted to median wage level for all plants.

with the same plant and facilities. This information was used to calculate a *pounds of cattle and hogs slaughtered per man hour* at the larger output, which, in turn, provided a clue as to the current position of the firm on its cost curve.<sup>7</sup>

Figures 4 through 8 show actual killing floor labor costs per 100 pounds of cattle and projected costs with 50 percent more volume for groups of firms, holding all other variables constant. Figure 4 is composed of firms that slaughtered an annual volume of more than eight million pounds of cattle. Average labor cost per 100 pounds on the killing floor in Plant 6 was 20 cents less than in Plant 22. Part of this variation can be explained by the fact that wage levels for labor were \$1.12 per hour higher in Plant 22.

Figure 5 portrays the same plants and the same hourly rate of kill per man-hour as Figure 4, but with an equal wage level assumed for all five plants. As can be seen in Figure 5, the labor costs come much closer together, indicating that the difference in wage levels among the five plants accounts for a large percentage of the variation and the physical efficiency is similar. The spread between costs of Plants 6 and 22 now be-

<sup>7</sup>Cf. Galbraith, John K. and Richard H. Holton, *Marketing Efficiency in Puerto Rico*. Harvard University Press, Cambridge. 204 PP.

comes less than 6 cents per 100 pounds.

The exact nature of the average cost curves of the various firms cannot be estimated because the data are limited to only two points. If a U-shaped average cost curve is assumed, then certain generalizations can be made with reference to the relative positions of each plant on its average cost curve.

From the slope of the lines and the relative positions of the dots in Figure 4, it can be generally surmised that Plants 6, 11, 26, and 22 are on the left side of their average cost curves, which means they should be able to expand their labor force on the killing floor and expand their volume with decreasing average labor costs with existing plant size. Plant 19 in Figure 4 is probably on the bottom of its average cost curve. However, there is not enough information to know how much more its output could be increased before the plant would experience increasing average cost per unit.

Figure 6 illustrates the same points as Figure 4 except the firms listed slaughtered between three million and eight million pounds of cattle in 1955.

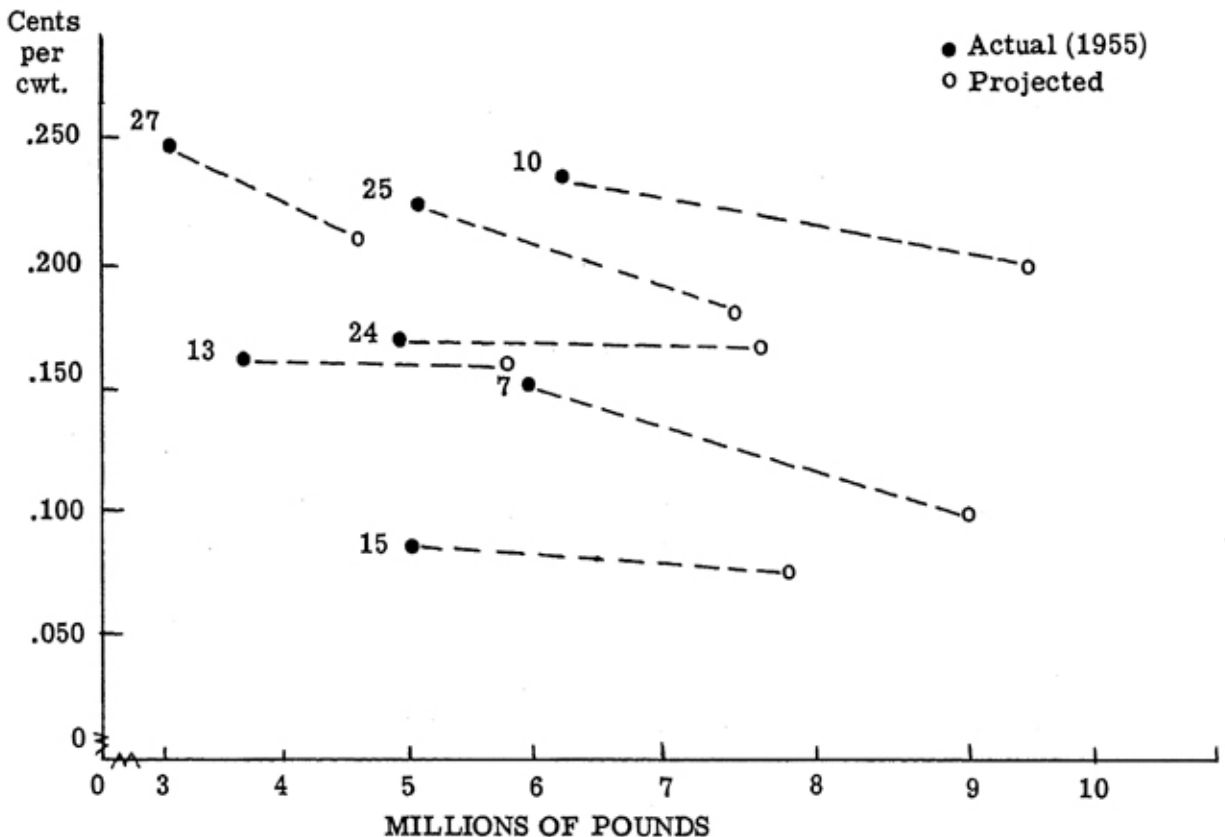


Figure 6 -- Killing floor labor cost of cattle slaughter in plants with annual volume of more than 3,000,000 pounds but less than 8,000,000 pounds, and projected cost with 50 percent increase in volume.



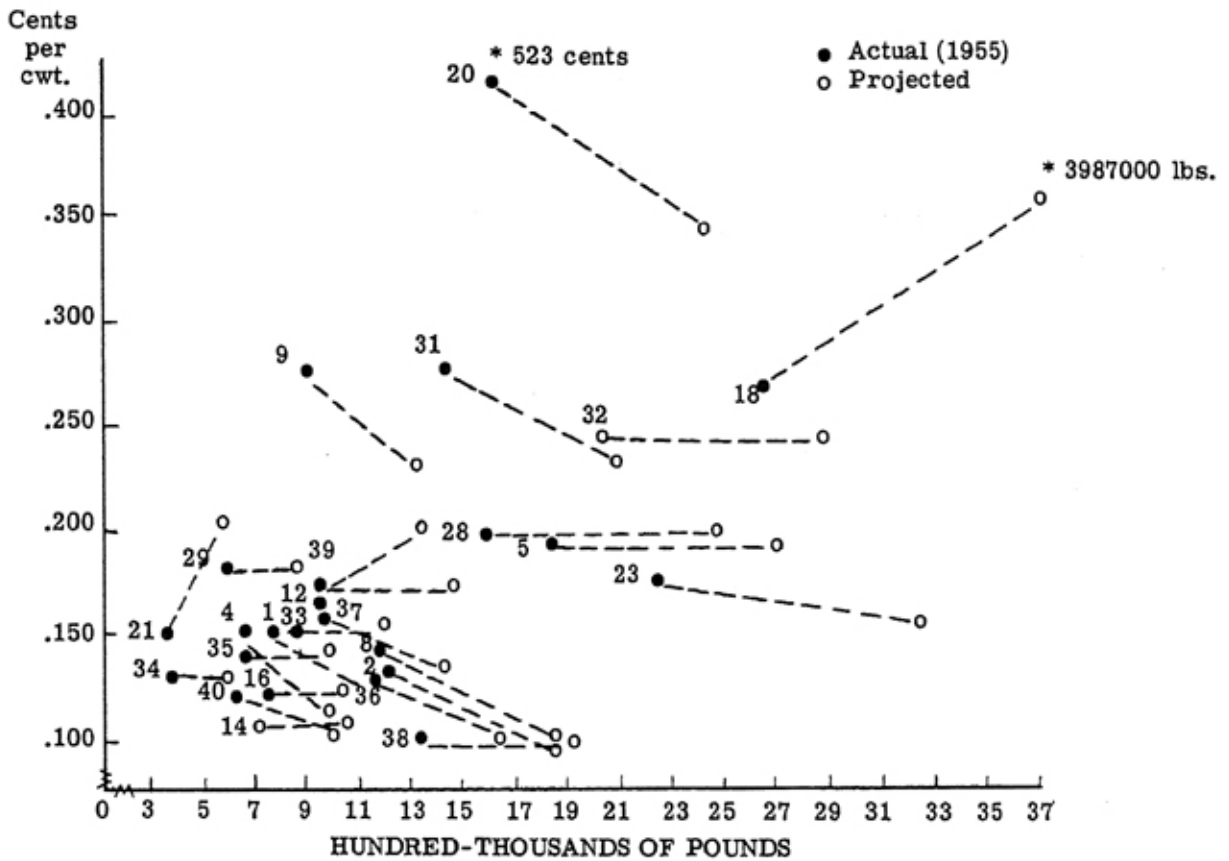


Figure 7 -- Killing floor labor cost of cattle slaughtered in plants with annual volume of more than 300,000 pounds but less than 3,000,000 pounds and projected cost with 50 percent increase in volume.

Figure 7 portrays still another size group of firms and shows some firms that were or would be on the upswing of their average cost curves. The managers of Plants 12, 21, and 18 indicated that their average cost per 100 pounds would increase with an increase in volume of 50 percent. It is not known whether these firms were on the bottom of their average cost curves when interviewed, or whether they were already on the upswing of the curve.

The comparison of present killing floor labor costs with projected killing floor labor costs has served to establish one general point: Most plant managers considered their plants sufficiently underutilized that a 50 percent increase in output would decrease the average costs of killing floor labor.

A fact that should be emphasized is that both the actual figures and the projected figures of labor costs were the *estimates* of each plant manager. When the plant managers were asked how much more labor they would need to handle 50 percent more volume, their replies were accepted without question, except in those isolated cases where the projection ap-

peared unreasonable.

Labor costs of slaughtering when computed per hundred-weight were influenced by varying carcass weights at the plants. Costs on a per head basis for all plants with a 1955 volume exceeding three million pounds are shown in Figure 8. While there was considerable variation among plants, average costs appeared to increase rapidly with increases in volume.

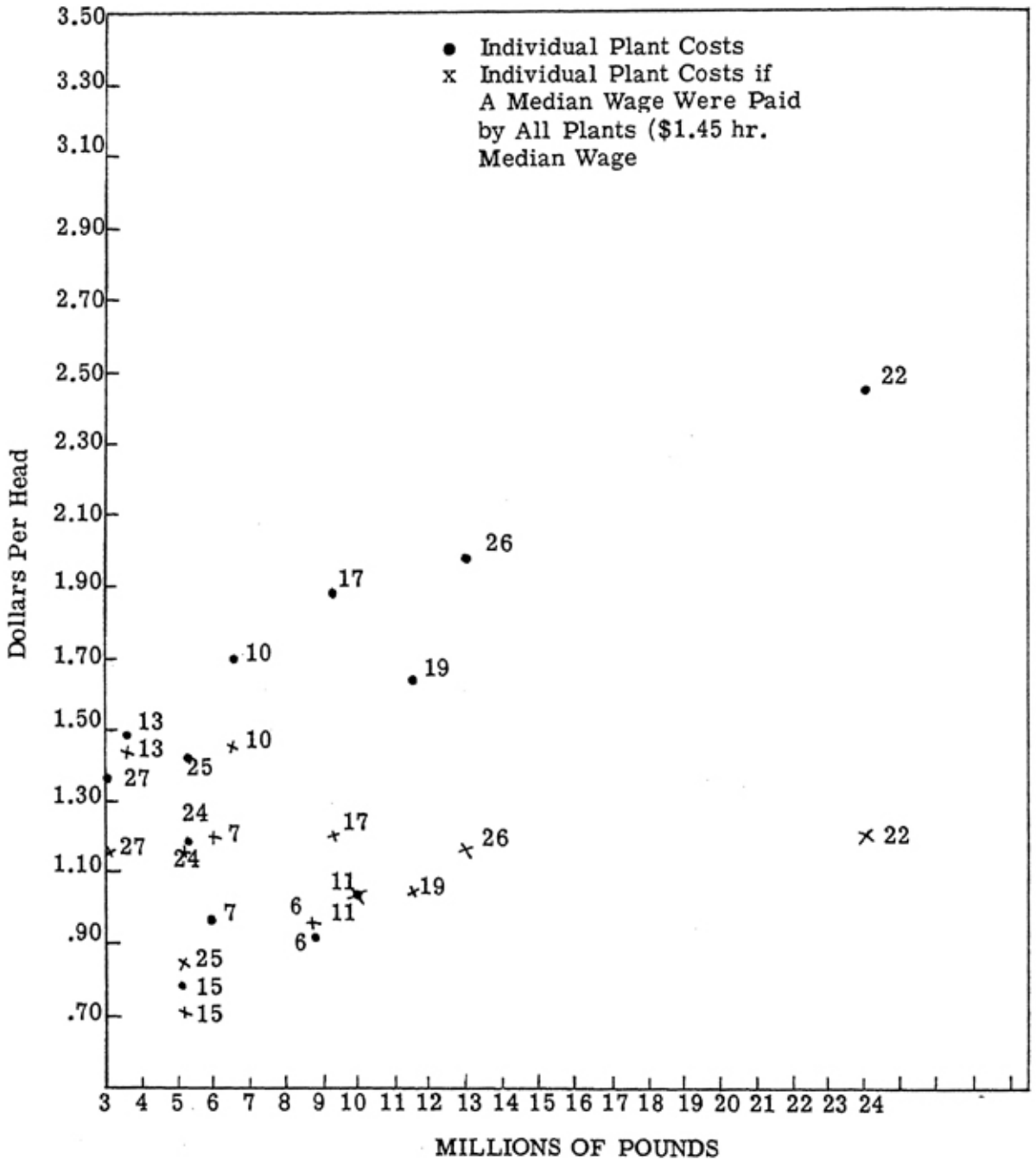


Figure 8 -- Killing floor labor cost per head of cattle slaughtered in plants with annual volumes exceeding 3 million pounds, 1955.

This relationship, however, resulted from the fact that the plants with larger outputs paid higher wages. The second group of dots in Figure 8 show what the plant costs would be if the same wage—the median wage of \$1.45 an hour—were paid at all plants. These dots still show some variation of average costs but apparently no relation to volume of output.

A combination of efficient labor and low wages gave several plants a highly advantageous slaughtering cost position. Labor costs of slaughtering cattle were less than \$1.00 per head in seven plants. However, a labor cost of \$1.00 to \$1.25 and 1.2 to 1.5 head slaughtered per man-hour were more typical of these Missouri meat packers in 1955 (Table 7).

TABLE 7. CATTLE SLAUGHTERING RATES AND LABOR COSTS

Pounds Killed Per Man-hour	Number of Plants*	Cattle Killed Per Man-hour	Number of Plants*	Range in Labor Cost Per Head of Killing Cattle
500 - 700	8	1	17	\$1.00 - \$3.40
701 - 900	18	1.1 - 1.25	10	.96 - 2.44
901 - 1100	8	1.3 - 1.5	9	.67 - 1.75
1101 - 1300	3	1.6 - 2.0	2	.78 - 1.42
1301 - 1500	1			

\*One firm slaughtered veal calves exclusively and is not included.

Hog slaughtering rates varied much more than cattle slaughtering rates (Table 8). The middle group of rates was three to four hogs per man-hour but plant rates varied from 1.3 to 7.5.

TABLE 8. HOG SLAUGHTERING RATES AND LABOR COSTS.

Pounds Killed Per Man-Hour	Number of Plants	Hogs Killed Per Man-Hour	Number of Plants	Range in Labor Cost Per Head of Killing Hogs
200 - 400	5	1.3 - 2.0	5	\$0.52 - \$1.94
401 - 600	4	2.1 - 3.0	8	0.38 - .69
601 - 800	5	3.1 - 4.0	5	0.25 - .51
801 - 1000	4	4.1 - 5.0	6	0.20 - .30
1001 - 1200	5	5.1 - 6.0	4	0.18 - .23
1201 - 1400	5	7.0	1	0.22
1401 - 1600	1	7.5	1	0.22
1601 - 1800	1			

A comparison of hog and cattle slaughtering rates and costs by areas reveals some striking differences. (Table 9). The average hog slaughtering rate was only 1.9 per man-hour in St. Louis compared to 6.1 for Cape Girardeau. Low productivity and higher wages in St. Louis produced an average slaughter cost per hog that was more than six times the labor costs in Cape Girardeau and Springfield and four times the cost for other

TABLE 9. SLAUGHTERING RATES AND LABOR COSTS BY AREAS;

Area	Number of Hogs Killed Per Man-Hour		Labor Cost of Killing Per Hog		Number of Cattle Killed Per Man-Hour		Labor Cost Per Head of Killing Cattle	
	Mean*	Range	Mean*	Range	Mean*	Range	Mean*	Range
St. Louis	1.9	**	\$1.62	**	1.29	1.0-1.7	\$2.03	\$1.42-3.40
Springfield	5.3	2.5-6.0	.27	.23-.68	1.36	1.2-1.5	1.05	.93-1.36
Cape Girardeau	6.1	4.3-7.0	.25	.22-.30	1.41	1.0-2.0	.88	.78-1.48
All Other Plants	3.8	1.3-7.5	.46	.18-.96	1.12	1.0-1.5	1.30	.67-2.00

\*Area means are weighted by number of head slaughtered annually by each firm. Firm killing veals is excluded.

\*\*Only 2 hog slaughterers, so the range is not revealed.

plants. Presumably, this unfavorable cost situation was related to the fact that only two of the eight St. Louis packers were slaughtering hogs and their combined volume was under 10,000 head. The average cattle slaughtering rates by areas were quite similar, ranging from 1.2 to 1.41. However, the average labor costs per head in St. Louis were about double the costs elsewhere because of higher wage rates.

The slaughtering rates must be interpreted cautiously as the data obtained provides only an approximation of the potential rate if the slaughtering line were assumed to be in full-time operation. Typically, the line was idle and the men were employed elsewhere in the plant much of the time. Thus a detailed accounting of costs would probably vary considerably from the estimates computed here.

**Labor Utilization in Processing:** Five firms sold beef and/or pork in the carcass form only. The degree of processing varied among the other 35 firms. The principal variations were in the pork operations. Twenty-five of the 30 firms processing pork cured some hams, shoulders, and bacons, but only 14 made sausage.

Earlier in the text it was pointed out that specialization of labor in the small packing plant is much less than in a large packing plant. Even though some interchanging of jobs for the killing floor labor occurred in these small plants, men were hired and paid as killing floor labor. The same was true of processing operations. Although men did various jobs, some were hired and paid specifically as processing labor.

As was the case with killing floor labor, the number of men hired for processing varied among the plants. This was due to differences in degree of processing, volume of meat handled, size of facilities, amount and type of machinery, degree of skill of the labor, and nature of union agreements. The range in number of men hired for processing in the 40 plants was from one to 87. This gave a mean of nearly 12 men in processing per plant; 26 plants were below the mean of 12 and nine were above.

Efficiency of labor utilization in processing could not be estimated since the extent of processing was not measured. It is interesting to compare the ratio of processing labor to killing floor labor in the various plants. The ratios ranged from 1:4 to 7:1 (Table 10). Presumably, variations in degree of processing, in definition of tasks called processing, and in efficiency of labor all had an influence upon the variations among plants in the ratio of processing labor to killing floor labor.

As is illustrated in Table 10, 37 percent of the 35 plants maintained ratios between 1:1 and 2:1. The mean ratio of 35 plants was two processing employees for every killing floor employee.

TABLE 10. RATIO OF PROCESSING LABORERS TO KILLING FLOOR LABORERS IN 35 PLANTS\*.

Ratio of Processing Labor to Killing Floor Labor	Number of Plants
1:4 - 1:3	2
1:3 - 1:2	5
1:1 - 2:1	13
2:1 - 3:1	6
3:1 - 4:1	5
4:1 - 5:1	2
5:1 - 6:1	0
6:1 - 7:1	2

\*Ratio expresses the number of workers hired in a firm to process meat in relation to number of workers hired to work on the killing floor.

The seven plants that maintained a processing and killing floor labor ratios between 1:4 and 1:2 had total volumes ranging from 675 thousand pounds to 24 million pounds. The four plants that maintained a processing and killing floor labor ratio between 4:1 and 7:1 had total volumes ranging from 6,070,000 pounds to 12,900,000 pounds. The preceding comparison indicates that there was no apparent relationship between size and amount of processing done in each plant. There was, however, a relationship between number of processing laborers and processing volume.

Thirty-two of the 35 plant managers reported that they needed no new or additional equipment for the volume of processing they were doing.

**By-Product Utilization:** By-products comprise an important portion of the large meat packer's sales. Smaller meat packers have often neglected utilization of by-products for various reasons. An economic evaluation of alternatives in handling by-products was beyond the scope of this study. However, information was obtained concerning utilization, sales outlets, and revenue of several important types of by-products.

Hides are one of the important by-products of the packing industry. Hides that are sold by a small rural packer are usually classified as "country" or "small packer" hides. These hides are generally of poorer quality and bring a lower price on the market than "packer" hides. Also, the small packer does not handle a large enough volume of hides to be able to deal in carload lots of various grades of hides, whereas the large packer handles large quantities of hides and can sort them into various grades.

Prices received for hides varied among the 39 non-federally inspected packing plants in Missouri because of differences in their management of hides, volumes, and transportation costs and the grades and weights of their hides. Table 11 indicates the prices received for hides during 1955.

In 1955, the lowest price any plant received for hides was 5 1/2 cents

TABLE 11. PRICE RECEIVED FOR GREEN SALTED CATTLE HIDES BY 39 PACKING PLANTS IN MISSOURI; 1955.

Price Received (cents per lb.)	Number of Plants	Percentage of Total Hides
5 to 7 1/2	8	18.0
8 to 10 1/2	9	13.9
11 to 13 1/2	16	36.8
14 to 16	6	31.3

per pound and the highest price received was 16 cents per pound. The three plants that received the highest prices for hides were those who sold direct to tanneries in St. Louis. Table 12 shows the points to which hides were shipped and the percentage of all hides shipped to each point.

TABLE 12. LOCATION OF HIDE DEALERS OR BROKERS AND PERCENTAGE OF TOTAL HIDES HANDLED; 1955.

St. Louis	
Dealers and Brokers	48.5%
Direct to tanneries	28.4
Springfield	12.8
Joplin	3.3
Kansas City	2.9
Cape Girardeau	1.4
Little Rock, Arkansas	.9
Sedalia	.7
Cameron	.7
Paris	.4

Inedible offal from livestock slaughter has economic value as a source of animal tankage. Many national packers render their own tankage. This operation is not always practical for a small packer as it requires investment in such equipment as rendering tanks, steam presses, and evaporators. Table 13 indicates the disposal of inedible tankage materials by the 40

TABLE 13. DISPOSAL OF INEDIBLE MATERIALS, PRICES RECEIVED, AND VOLUME OF SLAUGHTER BY PLANTS IN EACH CATEGORY; 1955.

Amount of Processing	Number of Plants	Range in Prices Received	Total Percent Slaughtered
Processed Tankage	4	\$60 to \$85 per ton	25.3
Green Tankage	4	\$46 to \$50 per ton	10.9
Cooked Inedibles	11	1 to 3 cents per lb.	43.7
Raw Inedibles	21	0 to 1/2 cents per lb.	20.1

packers in Missouri, the prices received for the various products, and the percent of slaughtering done by the firms in the various categories. Over half the packing firms did no processing of inedible tankage materials. In three cases, the packers buried the waste material in a field near the plant. Although most of the smaller firms did no processing of inedibles, no direct relationship was apparent between size of plant and the manner in

which inedibles were handled. Table 14 shows the volume of all livestock slaughtered in the smallest plant and largest plant in a group of firms that handled inedibles in a specific manner.

TABLE 14. METHOD OF PROCESSING INEDIBLES ACCORDING TO SIZE OF PLANT

Method of Processing	Volume of Slaughter in Smallest Plant (lb. live-weight)	Volume of Slaughter in Largest Plant (lb. live-weight)
Processed Tankage	6,862,500	17,935,550
Green Tankage	2,487,800	8,977,900
Cooked Inedibles	2,825,000	24,000,000
Raw Inedibles	675,000	3,737,500

The manner in which each firm handled its tallows and fats was related to the manner in which it handled its inedible materials for tankage. The largest firms tended to be more careful with the tallows and fats and separated them into edible and non-edible fats, thereby getting a better price for their product. The firms that did no processing of inedible materials for tankage generally disposed of tallows and fats with the other materials. The range in prices received for tallows and fats in 1955 was from 1½ to 6½ cents per pound.

By-products added substantially to the income of many of the firms. Table 15 indicates the estimated gross income from four principal types of

TABLE 15. ESTIMATED GROSS INCOME FROM BY-PRODUCTS OF 40 FIRMS IN 1955\*

Item	Estimated Gross Income
Hides	\$845,931.00
Edible Fats	87,710.00
Tankage (green and Processed)	34,884.00
Inedible Offal	14,600.00
Total Gross	\$983,125.00

\*Each firm's individual by-product income was calculated from information given on each schedule pertaining to grades and weights of livestock slaughtered, disposal of by-products, and prices received. By-product yield estimates were based upon data from By-Products of the Meat Packing Industry, American Meat Institute, 1950.

by-products sold during 1955. It was apparent that many of the plant managers did not recognize the importance of by-products or were unable to utilize them effectively either because of lack of equipment or insufficient volume. Failure to realize the importance of practicing some sort of quality control in the handling of by-products is a problem facing this phase of the packing industry today.



**Custom Slaughtering by Wholesale Packers:** Some custom slaughtering of hogs was done by 24 packers. These packers and three others also custom slaughtered cattle. Their custom operations were generally a minor part of the total business. Custom slaughtering was 25 percent or more of wholesale kill in only eight plants for hogs and in only seven for cattle. Custom hog kill in 1955 was 200 head or less in nine plants and custom cattle kill was 100 head or less in eight plants. However, custom hog slaughter was 500 head or more in 8 plants, and custom cattle slaughter was 300 head or more in 13 plants. The range in custom hog slaughter by firms was 15 to 2000 with a total of about 12,000 head in 24 plants. The range in custom cattle slaughter by plants was seven to 2490 with a total of about 8800 in 27 plants.

Brief data about services rendered and charges were obtained from the few firms that had custom slaughter amounting to 300 cattle or 500 hogs or more. Hog slaughtering charges ranged from 1 to 3 cents a pound with a median of 1.5 cents. Cattle slaughtering charges ranged from \$3 to \$12.50 per head. Only eight firms did any custom processing. Processing charges were generally 3 or 4 cents a pound for both cattle and hogs. Smoking and curing charges were 4 cents a pound at two plants, 5 cents at two, 6 cents at one, 7 cents at one, and 7.5 cents at another.

### Meat Distribution and Market Structure

**Market Structure:** It is difficult to characterize the structure of this segment of the industry by any formal competitive model. Perhaps the most appropriate name would be "small firms in oligopolistic competition." Although these packers are small in relation to the few big national packers, there seems little doubt that there is a considerable degree of interdependence among these firms within a given market area.

The 40 firms included in this study used three principal types of outlets for distributing their meat and meat products: (1) Institutional (schools, restaurants, hotels, etc.); (2) wholesale (retailers, jobbers, other packers); and (3) retail (direct to consumer). Table 16 shows the percentage of meat distributed through each of these outlets and the number of firms using each outlet. The wholesale outlet was by far the most important means of distribution. Twenty-one of the firms used the wholesale outlet exclusively.

TABLE 16. IMPORTANCE OF MAJOR OUTLETS IN MEAT DISTRIBUTION

Outlets	Percent of all Meat	Number of Firms
Wholesale	95.6	40
Institutional	4.0	18
Retail	0.4	5

The plant managers were asked if there were any company owned subsidiaries through which the packing plant could distribute its products. Six firms did own or partially own such subsidiaries. The range in percentage of meat distributed through these subsidiaries for from 10 percent to 25 percent of the total volume of each plant. This suggests experiments in vertical integration by these six firms.

The objective of the packers seemed to be to open up and maintain or enlarge a rather specific area or "trade territory" in which there was a constant or increasing demand for their products. A problem the packer often encounters is that of other packers' trying to serve the same territory or part of the same territory. The result is an overlapping of trade territories.

Each of the 40 firms had developed a trade territory in which it sold its product. The extent to which each trade territory was worked varied considerably as did the geographical area of the trade territories.

Figure 9 illustrates the overlapping of distribution areas of five plant areas. There were further overlappings of firm distribution areas within

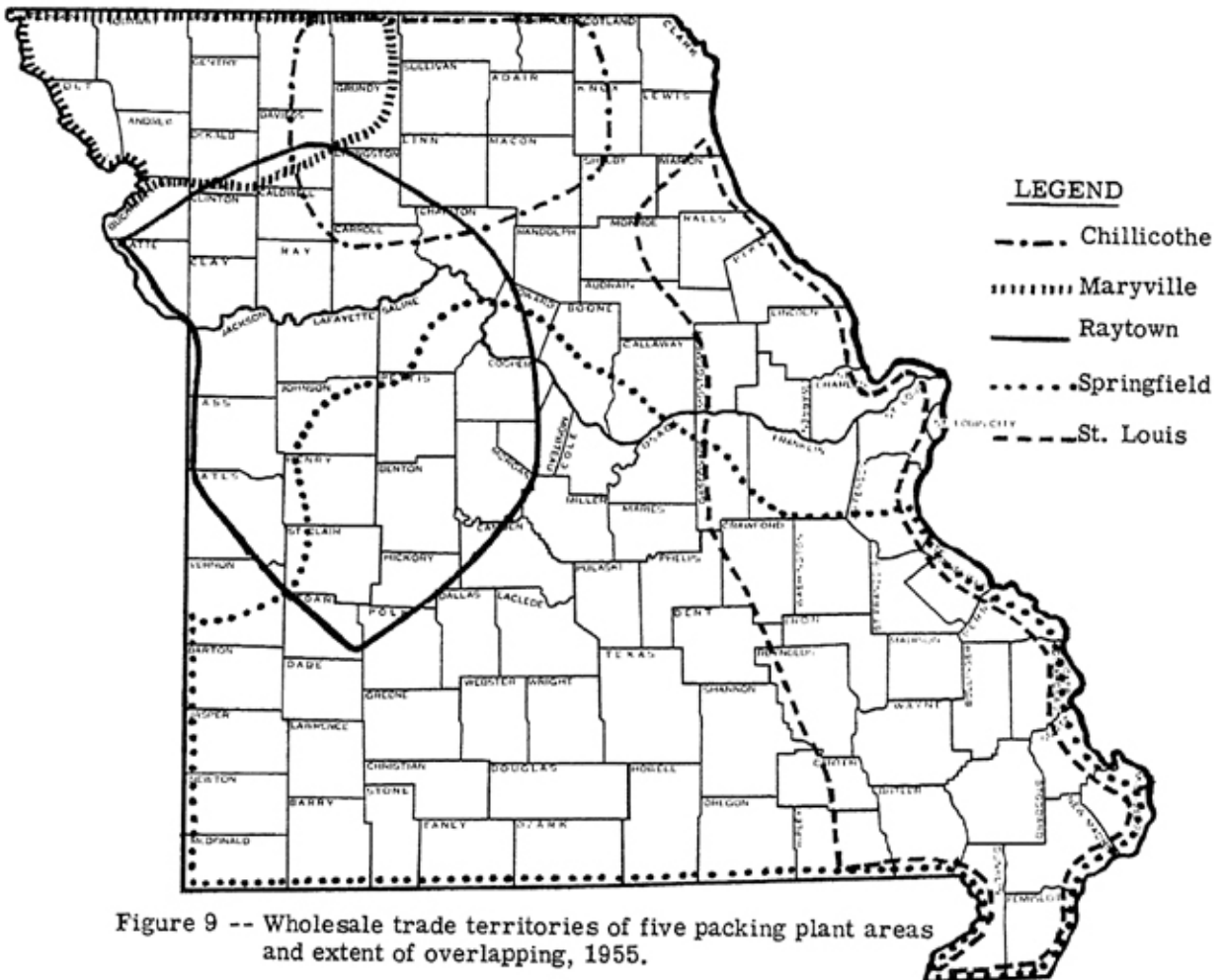


Figure 9 -- Wholesale trade territories of five packing plant areas and extent of overlapping, 1955.

each of these plant areas, of course, and further overlappings by other firms in the state. Moreover, the national packers and several smaller federally inspected packers distributed meats in most of these areas.

When asked to name the principal competitors for their business, the managers of the largest plants, such as those in Springfield, Raytown, Joplin, St. Louis, and Cape Girardeau, cited some of the national packers, while the managers of the smaller plants usually named one of the larger non-federally inspected firms or a neighboring firm of approximately the same size. Some retailers may find it advantageous to buy from a small local packer because of certain services it renders. If the same advantage applies to all small packers in an area, this tends to intensify the competition among the small packers.

Ten to 20 packing firms were competing in many areas. However, the number of packers competing for the business of a particular retailer would ordinarily be smaller. Each packer had a series of "accounts." Many of these "accounts" also bought from a few other packers, and there were attempts to develop new "accounts." However, most managers seemed confident of fairly secure markets. Several times managers initially replied, "none," to the question, "who are your principal competitors?"

Product differentiation was only partly developed. Twenty-two of the firms used brand names for their pork and/or beef (Table 17). Cured pork products were branded much more often than beef.

TABLE 17. USE OF BRAND NAMES AND THE PERCENTAGE OF TOTAL PRODUCTS SOLD UNDER A BRAND NAME

Product	Number of Plants	Percent of Total Product of Plants
Pork	20	40.69
Beef	13	11.83
Pork and Beef Total	22	19.44

The amount of brand-naming done by the 22 firms ranged from 1 to 100 percent of their total pork, and from 3 to 100 percent of their total beef. The median percentage of brand-naming was 40 percent for pork and 10 percent for beef.

The 40 firms spent approximately \$152,675 for advertising in 1955. The range went from nothing to \$42,000. Table 18 shows the amount spent for advertising by groups of firms, the percentage of the total expenditure each group contributed, and the percentage of the total volume of livestock slaughtered by each group. The amount spent for advertising was not correlated directly with the volume. The simple coefficient of correlation of amount spent for advertising and volume handled by firm was

TABLE 18. AMOUNT AND PERCENT OF TOTAL EXPENDITURE OF PLANTS SPENT FOR ADVERTISING AND PERCENT OF TOTAL VOLUME OF LIVESTOCK SLAUGHTERED BY EACH GROUP; 1955.

Range in Expenditures	Number of Plants	Average Amount Spent per Plant for Advertising	Percent of Total Live-Stock Slaughtered	Percent of Total Expenditure for Advertising
\$ 0 to \$ 500	24	\$ 94	48.1	1.5
500 to 1000	5	580	9.4	1.9
1000 to 2000	1	1000	3.7	.7
2000 to 4000	2	2000	4.0	2.6
4000 to 8000	2	4500	8.0	5.9
8000 to 16000	3	11000	12.7	21.7
16000 to 32000	1	18000	3.1	11.8
32000 to 42000	2	41000	11.0	53.9
<b>TOTALS</b>	<b>40</b>		<b>100.0</b>	<b>100.0</b>

0.10. The amount of money spent for advertising was more dependent on type of operation than on size of business. Neither of the two firms that spent the largest amount of money for advertising was among the largest firms in the population. The largest firm spent no money for advertising. While it is true that the two firms that spent the most money had the two largest trade territories, the firm with the third largest territory spent no money for advertising.

The packers had 153 meat delivery trucks on the road during 1955; 115 of them were refrigerated. Only one firm did not own a truck; its distribution was through a jobber. The range in trucks per plant for the other 39 plants was from one to 17. The range was the same for refrigerated trucks. No shipments were made by other means of transportation.

The "Yellow Sheet" of the National Provisioner was quite popular with the packing plant managers, with 27 subscribers to it. Six firms did not subscribe to a trade journal. Three firms were members of the American Meat Institute (AMI), and seven were members of the National Independent Meat Packers Association (NIMPA). Seven St. Louis packers belonged to the St. Louis Local Meat Packers Association. Fifteen non-federally inspected meat packing firms in Missouri belonged to an organized trade association. Many of the non-member plant managers seemed rather skeptical about the benefits of membership in the trade organizations.

The market structure of the non-federally inspected meat packers in Missouri is largely determined by events and circumstances—both present and past—in the larger market environment of the whole industry. Briefly stated, meat packing is an industry of many small and medium-sized firms and a few very large firms. The impact of the business decisions of the

very large firms upon the market is readily recognized, although the degree of the interdependence may not be exactly measured. As already indicated, even small firms have cause for recognizing mutual dependence in local market areas. The struggle among competitors is conducted partly through product differentiation, advertising, special services, attempts to win public favor and influence legislation, and other forms of non-price competition. Thus, meat packing is an industry of many firms which behaves in a manner rather similar to an industry of a few firms. While the industry lacks the behavior of pure competition, it also lacks the profit ratios of many oligopolistic industries. While some of the causes of low profits are probably not perceived, there are several factors which help to account for the many small firms in meat packing and the general low level of industry profits. Bain presents evidence that the barriers to entry in meat-packing are extremely low. This reflects: (1) absence of significant economics of scale; (2) relatively minor degree of product differentiation, and (3) relatively small capital required for beginning a meat packing business.<sup>8</sup>

### Short-Run Estimates.

Each plant manager was asked what he thought his plant's relative position would be in the next five years (by 1960). Thirty-one of the plant managers thought their plants would be larger. Estimates as to how much larger their volume might be ranged from 10 to 50 percent. Six of the managers thought their firms would be no larger and three of the managers felt they would be out of business. Table 19 reports the range of probable expansion in volume of packing plants within the next five years as expressed by the plant managers. A total increase for the 40 plants of 20 percent was forecast.

TABLE 19. ATTITUDE TOWARD PROBABLE EXPANSION IN NEXT FIVE YEARS AS REPORTED BY PLANT MANAGERS

Probable Change in Annual Volume	Number of Plants	Volume of Smallest lb.	Volume of Largest lb.	Percentage of Total Volume of All Plants
30 to 50 Percent Larger	5	3,036,500	24,000,000	35.9
10 to 30 Percent Larger	26	360,000	13,000,000	54.2
No Change in Size	6	865,000	8,977,900	7.5
Be Out of Business	3	910,000	2,658,500	2.4

Ten of the firms indicated they would obtain federal inspection within the next five years. Six of those 10 plants were slaughtering more than eight million pounds annually, while the other four plants were slaughtering more than three million pounds annually. These 10 firms felt that it

<sup>8</sup>Joe S. Bain, *Barriers to New Competition* (Cambridge: Harvard University Press, 1956).

would be to their advantage to have federal inspection because it would put them on a stronger competitive footing with the national packers with whom they were gradually competing more keenly. The increasing popularity of federal grading and the costs of local inspection may increase the number seeking federal inspection.

Twelve of the firms included prepackaging of frozen meats in their plans for the next five years. These firms had volumes of more than three million pounds annually and expected their business to be at least 10 per cent larger. This was more evidence of the small packers' attempt to reach a better competitive position with the national packers by keeping up with potential developments in the meat packing industry.

Managers did not note a concern with two trends which will probably affect them considerably. First, the diminishing number of small retailers—particularly in the smaller towns—is reducing their actual and/or potential markets. Second, as labor becomes more and more expensive in our society, and as labor is attracted out of the lower-wage rural areas, many of these small packers may anticipate increases in wage levels. Adjustments toward labor-saving equipment will require reorganization for many.

## PART II

### THE CUSTOM SLAUGHTERING INDUSTRY

A list furnished by the Food and Drug Bureau of the Division of Health of Missouri designated approximately 300 custom slaughterers in the state. This list was compiled five years ago and some changes in the custom slaughtering industry had taken place at the time of the survey. Some establishments on the list had gone out of business and new businesses had been started since the list was compiled.

Since an adequate list of custom slaughterers was not available, an area sampling technique was used. Twenty counties were selected with probability of county selection weighted by the available estimated number of custom slaughterers. It was found during the field work that three counties in the sample had no custom slaughterers. This necessitated the use of the predetermined alternate counties. Because of topographic, climatic, economic, and geographical livestock density differences between north and south Missouri, it was felt that the sample should be divided in a manner assuring an equal sampling of each section. A line was drawn from east to west across the state, approximately one county below the Missouri River. The three counties in which St. Joseph, Kansas City, and St. Louis are principally located were eliminated. There were 52 counties

in the north stratum and 59 counties in the south stratum. A selection was made of nine counties from the north and 11 counties from the south. All custom slaughterers within each sample county were contacted.

The schedules were taken by personal interview from the forty-eight custom slaughterers between February 15, 1956, and May 29, 1956.

**General Characteristics of the Sample**

**Location and Size of Plants:** Figure 10 gives the location and size of the custom slaughtering plants sampled for this study. Thirty-two of the 48 plants sampled were south of the Missouri River. Five plants slaughtered more than 300,000 pounds of livestock in 1955, and 43 plants slaughtered less than 300,000 pounds. All five of the largest plants were located south of the Missouri River.

**Ownership:** Thirty-two of the firms were single proprietorships; 14 were partnerships; one was a cooperative; and one was privately incorporated.

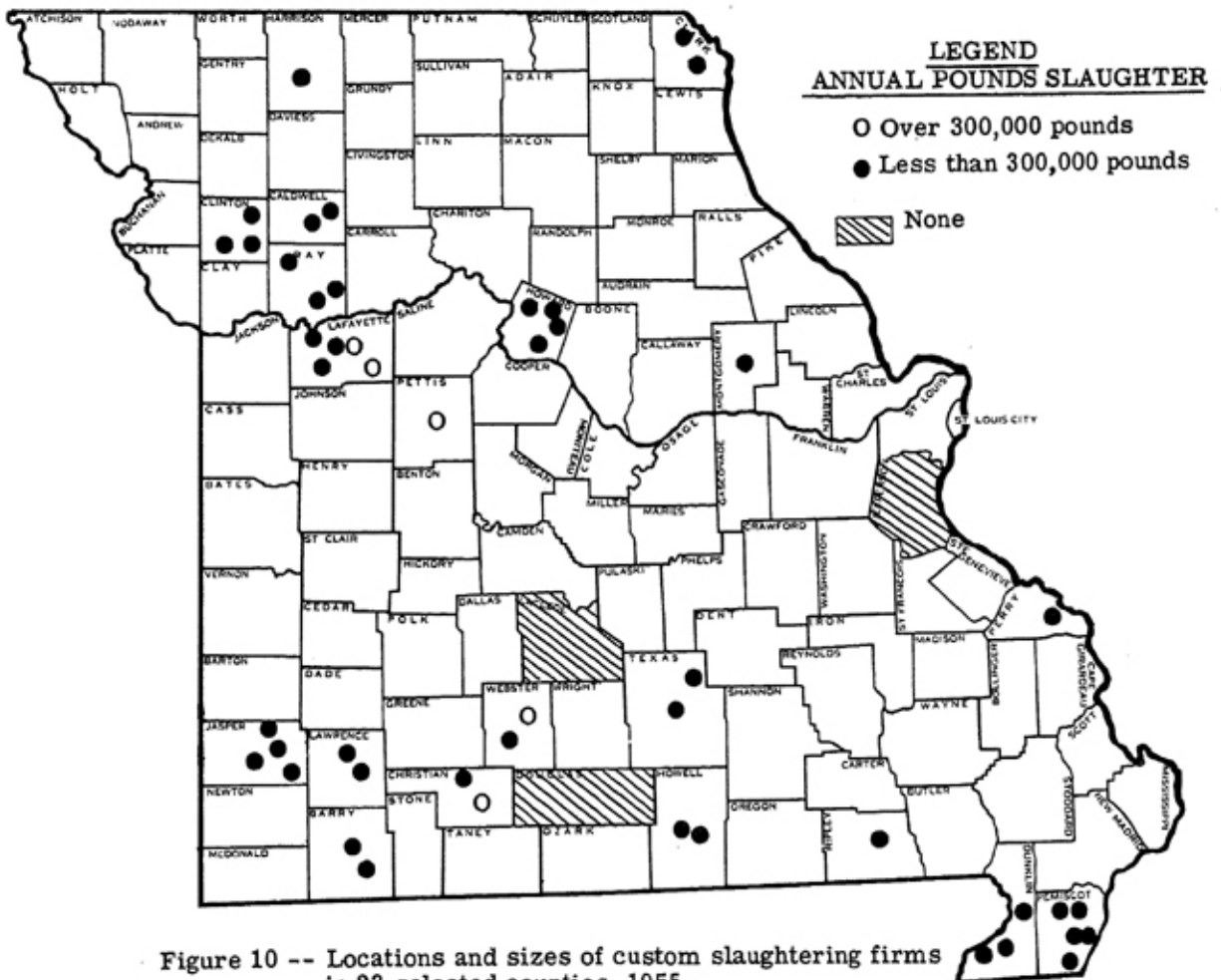


Figure 10 -- Locations and sizes of custom slaughtering firms in 23 selected counties, 1955.

Twenty-seven of the 48 were operated in conjunction with locker plants. There was some relationship between size of firm and type of ownership. Nine of the largest firms in the sample were partnerships. The largest firm in the sample was a corporation.

All but one of the 27 firms that operated in conjunction with a locker plant were among the 30 largest firms in the sample.

**Age of Plants:** No well defined geographical pattern was established in relation to age of plants, as was the case with the plants of the non-federally inspected meat packers. There were both old and new plants in practically every county sampled. The average age of all plants was 12 years and the median age was 10 years. The range in age of plants was from one to 46 years.

**Inspection Services:** The custom slaughterers in this study were subject to inspection by two departments of the state government. The State Department of Agriculture inspected all establishments that had locker plants, but inspected the locker plant operation only. The State Bureau of Food and Drugs, who also inspected the non-federally inspected meat packers, inspected the killing and processing facilities of the custom slaughterers. The Bureau averaged four inspections yearly.

The need for closer and stricter inspection was more apparent in custom slaughtering plants than in the packing plants.

Sometimes, common sense rules of sanitation were violated because of ignorance on the part of the individual custom slaughterer. A stricter inspection service could improve this situation greatly.

### **Slaughtering Operations**

**Days of Week:** Custom slaughtering was a part-time business. There was no strict work schedule for most of the firms. They slaughtered as the business arrived. Thirty-one firms slaughtered from one to two days per week; nine firms slaughtered from three to four days per week; and eight firms slaughtered five to six days per week in the winter and closed down for the rest of the year.

**Size of Operations and Rate of Kill:** It was difficult to obtain accurate data on volume by weight of livestock slaughtered by custom slaughterers because few of them kept such records. However, the number of head slaughtered was fairly accurate. Average weights of 210 pounds for hogs and 600 pounds for cattle were used for comparative purposes. These weights appeared to be fairly good averages, based on discussions with custom slaughterers concerning the weights of livestock they usually slaughtered.



TABLE 20. TOTAL NUMBER AND TOTAL WEIGHT OF LIVESTOCK CUSTOM SLAUGHTERED IN 1955 BY 48 PLANTS.

Species	Number of Head	Pounds (live wt.) (estimated)
Hogs	21,480	4,510,800
Cattle	10,064	6,038,400

Table 20 gives the total numbers and weights of cattle and hogs slaughtered by this sample of custom slaughterers during 1955.

Table 20 shows that approximately 10,500,000 pounds of livestock were slaughtered by 48 custom slaughterers in 1955. An approximation of the total amount of custom slaughtering done in Missouri in 1955 can be made by projecting the sample to include all custom slaughterers. The sample had an average of 1.9 custom slaughterers per county in the south stratum and 2.4 in the north stratum. Expanding the sample results in an estimate of 125 custom slaughterers in the north stratum and 112 in the south stratum, or a total of 237 custom slaughterers in Missouri. It is estimated that approximately 52,000,000 pounds of livestock were slaughtered by the entire custom slaughtering industry in Missouri in 1955. This was approximately one-fourth of the total livestock slaughter by the non-federally inspected meat packers.

Three of the 48 firms did not slaughter cattle. The range per firm in 1955 cattle kill for the other firms was from 12 to 1000. Median annual cattle kill was 200; five firms killed 400 or more; and 10 firms killed 100 or less. All of the firms slaughtered hogs. The range in 1955 hog kill was from 75 to 1500. Median kill was 364; four firms killed 1000 or more; 12 firms killed 200 or less.

Forty-five firms had slaughtering rooms, while three operators did all of their slaughtering out of doors. The average area of killing floor of the 45 firms was 679 square feet, or a room approximately 26 ft x 26 ft. The median area of a killing floor was 576 square feet, or a room 24 ft. x 24 ft. Killing floors of custom slaughterers averaged 36 percent as large as the killing floors of wholesale slaughterers in this study. The area of the killing floor was not related directly to the volume slaughtered. Some plants with a large volume of slaughter had smaller killing floors but more equipment than some of the plants with a smaller volume of slaughter.

On the whole, the custom slaughtering plants were rather poorly equipped as compared to the wholesale packing plants. Only one custom slaughterer had an electric saw for splitting carcasses. Eight plants had de-hairing machines, while the other 40 used bell scrapers (hand scrapers). Most of the custom slaughterers had no plans for modernizing or adding equipment in the future. Hired labor was relatively cheap and many own-

ers did their own work. A total of 56 laborers were hired by the 48 firms. Except for three cases, the owner or owners did much of the slaughtering and processing.

Table 21 gives the number of men employed by the 48 firms. Virtually all helpers were part time; they were paid by the hour and had no guaranteed work week. Two firms sub-contracted their slaughtering work for a percentage of the fee.

TABLE 21. NUMBER OF MEN EMPLOYED BY 48 FIRMS.

Number of Men Hired	Number of Plants
0	10
1	28
2	4
3	4
4 or more	2

The rates of kill per man hour did not vary as much between the custom slaughterers as in the case of the packers. The average rate of kill per man-hour for cattle and hogs is shown in Table 22.

TABLE 22. RATE OF KILL OF FIRMS PER MAN-HOUR

Species	Rate of Kill			
	Mean Rate	Median Rate	High	Low
Cattle	1.0	1.0	1.5	.5
Hogs	2.0	1.7	4.0	.8

Rate of kill per man hour of the custom slaughterers was substantially lower than that of the packers. This can be explained partially by the differences in skills of the labor and type of equipment on the killing floor. The "low" rates of kill per man hour indicate low efficiency on the part of custom slaughterers in that low range.

**Labor Costs:** Wages, in general, averaged much lower in the custom slaughtering industry than in the packing industry. This can be explained by the fact that in the custom slaughtering industry, (1) none of the employees were members of a union, (2) the labor was less skilled, (3) many of the custom slaughterers were located in areas with very low general wage rates, and (4) lack of equipment reduced productivity. The average hourly wage was \$0.96 per hour, compared with an average wage of \$1.60 per hour in the packing industry. The median wage level was \$1.00 per hour. The range in wages per hour was from \$0.50 to \$1.00.

Productivity was not reflected in wage levels. The simple correlation coefficient between pounds of cattle slaughtered per man-hour and hourly wage level was 0.21, while for hogs it was 0.30.

The average wage level of the custom slaughter firms was 40 percent lower than that of the packers, but the average labor cost of slaughtering 100 pounds of livestock was only 7 percent lower for the custom slaughterers. This points up the fact that the packers were considerably more efficient with their slaughtering operations than the custom slaughterers.

### Custom Slaughterers' Revenue

**Slaughtering Charges:** More custom slaughterers charged for killing livestock on a per head basis than by the pound. There appeared to be no particular reason for charging this way except that it was more convenient to charge by the head.

Table 23 portrays the number of firms slaughtering each species, the average and median charges, and the customary weight limits imposed for

TABLE 23. CHARGES AND WEIGHT LIMITS ON LIVESTOCK SLAUGHTER BY CUSTOM SLAUGHTERERS; 1955.

Species	Number of Plants	Average Charge Per Head	Median Charge Per Head	Customary Weight Limit
Hogs	48	\$2.94	\$3.00	300 lb.
Cattle	46	\$4.42	\$5.00	800 lb.

a specific charge. By customary weight limit is meant a limit on the number of pounds an animal may weigh before a higher rate is charged for slaughtering.

The range in charges made by custom slaughterers was from \$2 to \$4 per head for hogs and from \$2 to \$6 per head for cattle. The charges made by plants operating in conjunction with locker plants were similar.

**Processing Charges:** Of 48 firms, 38 did some processing beyond the carcass stage. The processing usually included cutting and wrapping for freezer, rendering lard, and grinding sausage and hamburger.

The mean and median charge for slaughtering, cutting and wrapping for freezer, rendering lard, etc. was 3½¢ per pound, dressed weight.

Custom slaughterers were asked what individual services they performed, if any, such as rendering lard and curing hams, and what charges they made, even though they may not have done the slaughtering. There was some variation in charges for individual services (see Table 24). Apparently, the charge for the service usually met the cost, although in some cases, part of the cost was charged to public relations.

TABLE 24. CHARGES FOR INDIVIDUAL PROCESSING SERVICES

Services Performed	Number of Firms	Average Charge Per Pound	Median Charge Per Pound	Range in Charges Per Pound (\$)
Age beef	3	\$0.013	\$0.01	\$0.01 to \$0.02
Cut and wrap	23	.036	.04	.01 to .05
Quick freeze	12	.015	.01	.01 to .04
Render lard	27	.025	.03	.01 to .04
Grind sausage or hamburger	30	.016	.015	.01 to .04
Smoke and/or cure	19	.057	.06	.04 to .07

**By-Products:** the disposal of inedible offal and other waste was ineffectively handled by approximately one-third of the custom slaughterers. There seemed to be a lack of appreciation of the health dangers of improper disposal of inedibles. Only two plants sold by-products; the rest gave them away. Cattle hides customarily went back to the owner of the animal. Eight custom slaughterers gave away the inedibles to be used for dog food; six buried the inedibles near their plants; and two scattered inedibles on a nearby field and plowed them under once a year. Thirty plants had the offal and other waste picked up by the local rendering companies.

Many of the custom slaughterers need information concerning sanitary methods of disposing of offal and other waste materials. Custom slaughterers cannot utilize by-products as effectively as packers because they lack volume.

**Estimated Operating Budgets:** Table 25 shows three sizes of firms in the sample and estimates of their respective income and labor costs. Labor cost was not as important to the custom slaughterer as it was to the packer. The smallest firm in the sample paid 18.3 percent of the gross margin for employed labor. That is very small, compared with the 58.3 percent average paid to labor from the gross margin in the meat packing industry. All custom slaughterers paid between 4.8 and 19.2 percent of their gross margins to labor. This situation suggests a very favorable position as far as the individual firms are concerned. However, in most cases the gross returns include the return for the proprietor's labor. The fact that the smallest plant grossed only \$1050 in one year raises a serious question as to the strength of the business. The proprietor estimated that he received 20 percent of his gross income from the custom slaughtering business. It should be remembered that almost all operators had other sources of income.

Table 26 illustrates the frequency distributions of plants within specific gross income ranges. Income ranges of \$3200 to \$6400 and \$6400 to \$12,800 were the most frequent in the sample. Average income of the 38 plants in the range of \$3200 to \$12,800 was approximately \$6,500.

Estimated gross income and revenue for all 48 custom slaughterers are shown in Table 27. Explicit labor costs were obviously a very small portion of total income for the custom slaughterers.

TABLE 25. COMPARISON OF THREE SIZES OF PLANT OPERATIONS; 1955.

Item	Largest Plant	Median Plant	Smallest Plant
Annual Volume (head)	1000 cattle 1500 hogs	129 cattle 569 hogs	25 cattle 75 hogs
Number of Employees	4	1	1
Average Hourly Wage	\$.50	\$.75	\$1.00
Days Per Week Operated	5	2	1
Weeks Per Year Operated	16	20	24
Total Labor Bill	\$1,280.00	\$240.00	\$192.00
Charge for Cattle	\$4/head	\$3/head	\$3.50/head
Charge for Hogs	\$3/head	\$2/head	\$2.50/head
Total Charge for Slaughtering & Processings			
Cattle:	3¢/lb.	3¢/lb.	\$12/head
Hogs:	3¢/lb.	3¢/lb.	\$10/head
Operate With Locker Plant	No	No	No
Estimated Gross Income	\$16,042.00	\$4,208.00	\$1,050.00
Estimated Gross Return*	\$14,762.00	\$3,968.00	\$858.00
Percent Labor of Gross Return	7.9%	5.7%	18.3%

\* Excluded only explicit labor costs.

TABLE 26. ESTIMATED GROSS INCOME AND RANGE IN VOLUME OF LIVESTOCK SLAUGHTERED; 1955.\*

Estimated Gross Income	Number of Firms	Range in Volume Slaughtered
\$ 800 to 1,600	2	30,750 to 51,000 lb.
1,600 to 3,200	6	49,200 to 105,150
3,200 to 6,400	23	105,000 to 282,000
6,400 to 12,800	15	210,000 to 450,000
12,800 to 14,800	2	615,000 to 915,000

\*Number of head of each species slaughtered during 1955 was taken from each schedule and multiplied by the average weight previously determined. For the plants that did no processing, the live weight volume was multiplied by the reported charges for slaughtering. For plants that processed, average dressed weight figures of 55 percent for cattle and 65 percent for hogs were used to calculate the dressed weight volume. These volumes were then multiplied by the reported charges for slaughtering and processing.

TABLE 27. INCOME AND LABOR EXPENDITURES OF 48 CUSTOM SLAUGHTERERS IN MISSOURI IN 1955.

Item	Custom Slaughterers 48 firms
Estimated Gross Income (1955)	\$249,626.00
Total Wage Expenditure	\$ 20,643.84
Number of Employees	56
Average Hourly Wage	\$ .96
Average Hours Worked Per Week	24
Average Weeks Worked Per Year	16
Estimated Gross Return*	\$228,981.16
Labor Percent of Gross Return	8.3%

\* Gross Income minus Wages Paid.

### Short-Run Outlook Estimates

Most custom slaughterers forecasted a brighter picture for themselves in the next five years. They stated that this was expected because more people were using lockers and home freezers, and because fewer farmers were slaughtering their own livestock. Most of them predicted no drastic changes in their status within the next five years, and 40 out of the 48 expected their operations to be from 5 to 10 percent larger by then. They intended to increase volume by hiring more labor, using the same facilities.