A DESCRIPTIVE ANALYSIS OF FROZEN FOOD LOCKER PLANTS IN OKLAHOMA

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CHAPTER I

INTRODUCTION

Prior to the innovation of mechanical freezing and cold storage, meat and meat products were preserved largely by cooking and canning, salt curing, and smoking. Salt curing and smoking were used primarily for pork, and the cooking and canning process was used for both pork and beef. Although salt curing and smoking continue to be popular curing methods, they are now used as a matter of custom and preference rather than necessity. In some areas meat is still being preserved by cooking and canning, but generally speaking this method of preservation has become obsolete. However, commercial meat packers and processors continue to use a modification of this method. This is evidenced by pre-cooked and canned hams, canned corn beef, and several other types of canned meat.

Artificial cold storage was first practiced in the northern states. During the winter ice was cut from the lakes and streams, taken to an "ice house" and kept for storage. This ice provided a limited type of cold storage for the spring and early summer seasons. Later, through the development and perfection of commercial ice plants, large quantities of ice were made available to the public throughout the year. This, along with the construction of well insulated "ice rooms" made it possible to have cold storage during all the year.

A short time later home-type ice boxes were developed and introduced to the public. These boxes were small, air-tight structures with a

compartment for a block of ice. This made possible a colder and more intensified cold storage area.

Although the development of the ice box was an important step forward in the preservation of food, especially in the home, the impact of artificial refrigeration, introduced about 1875, was even greater. In 1903, about 25 years after the introduction of artificial refrigeration, commercial locker plants came into existence.[1] At about the same time home refrigerators were made available to the public. These innovations did much to improve methods of preserving food and food products. Although commercial locker plants were established at an early date, there was little expansion of the industry until about 1930. Generally speaking, home freezer units were not available to most households until the post World War II period.

Several factors have contributed to the expansion of the locker-plant industry. In 1865 the Union Stock Yards in Chicago was opened as the first terminal livestock market. From that time until about 1920, the Midwest was the most highly concentrated area of livestock slaughter in the nation. However, in the 1920's and 1930's an increase in freight rates along with lower livestock prices induced farmers to market their animals closer to home. These two factors, along with the improvement of highways and motor truck transportation greatly affected the terminal markets. Decentralization is evidenced by the total slaughtering done by the four major packers in 1916 as compared with 1955.[2] In 1916, the four major packers slaughtered

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[1] L. B. Mann, Refrigerated Food Lockers, Farm Credit Administration Cir. No. C-107 (Washington, 1938), p. 1.

[2] "Four major packers" refers to Swift, Armour, Wilson and Cudahy.

about 54 percent of the cattle slaughtered in this country, while in 1955 the same four leading packers slaughtered only 31 percent of the cattle. In this case cattle slaughter shows the greatest decrease, but other categories of livestock slaughter also decreased significantly.[3]

Important structural changes in the packing industry include sharply curtailed branch house operations of non-slaughtering wholesale distributors and a marked growth in the business volume of independent (non-slaughter) meat wholesalers. Numbers of packing house branches decreased 43 percent in the period from 1929-1954, and their sales dropped 28 percent. In contrast, the business volume of independent meat wholesalers increased 114 percent during the same period. After 1948, price-adjusted sales of independent wholesalers increased several times faster than meat production in the United States.[4]

These changes in market structure for meat animals have had some effect on the growth of the locker plant industry. Other important factors contributing to the growth of the locker plant industry include (1) the need for refrigerated storage space during World War II, and (2) the public acceptance of and demand for frozen foods. During the decade of the 1950's, there was a decrease and then a leveling off in the number of locker plants in the United States. In 1951 there was an estimated 11,600 plants. By 1955 these locker plants had decreased to 10,533.[5]

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[3]Willard F. Williams, "Structural Changes in the Meat Wholesaling Industry", Journal of Farm Economics, Vol. XL, No. 2 (Ninasha, Wisconsin, 1958), p. 319.

[4]Ibid., p. 223.

[5]P. C. Wilkens, L. B. Mann, and B. D. Miner, Frozen Food Locker Plants, Farmers Coop. Serv. Util. Res. Rep. 1 (Washington, 1957), p. 1.

The locker plant industry in Oklahoma has followed the national trend. In 1939, only 31 plants were in operation, but twenty years later, in 1959, an estimated 216 plants were in operation.[6] During the last 10 years the locker industry in Oklahoma reached a peak of 242 licensed locker plants.[7] Estimates for the United States indicate that the locker plants going out of business have been of two major types: (1) plants with a capacity of less than 300 locker boxes and (2) plants with more than 1,000 locker boxes.[8] This has been only partially true for locker plants in Oklahoma. In this study it was found that seven of the 13 plants that were out of business by 1959, had less than 300 locker boxes and none of the 13 had more than 1,000 locker boxes.

Previous Research

The United States Department of Agriculture has made several studies of locker plants. In one study, the United States was divided into five geographic areas, and the locker plants of each area were compared to those in each of the other areas. The affiliation of the locker plants with other types of enterprises, locker rental rates, and processing charges were also studied.[9] Another study by the United States Department

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[6]Marshall Heck, "A Survey of Cold Storage Lockers in Oklahoma", (Unpublished M.S. Thesis, 1939), p. 8.

[7]Fifty percent of the 242 licensed plants were sampled and 13 of this 50 percent were out of operation. This indicates that 26 locker plants in the state have gone out of business in the last 10 years.

[8]P. C. Wilkens, L. B. Mann, and B. D. Miner, op. cit., p. 2.

[9]S. T. Warrington, Frozen-Food Locker Plants in the United States, Farm Credit Admin. Misc. Rep. No. 24 (Washington, 1940).

of Agriculture was directed toward specific problems of the industry, including financing and the operation of locker plants.[10]

Several state-wide studies of locker plants have been made during the past 10 or 15 years. A Purdue University study of plants in Indiana was directed toward problems confronting locker plant operators and locker-plant patrons. It also included some analysis of the financial requirements and the costs and revenues incurred in the operation of locker plants.[11] Another study at the state level was in Arizona. This study dealt mainly with owners of home freezers and analyzed such items as the ownership and utilization of home freezers and the rental of lockers by home freezer owners.[12]

One of the first studies of locker plants in Oklahoma was made by Marshall Heck in 1939. Because of the relative newness of locker plants at that time, a large section of this study was directed toward the proper methods of preparing and processing meat which was to be frozen.[13]

Purpose and Objectives of Study

The purpose of this study was to determine the characteristics and practices of the Oklahoma frozen-food locker and processing industry including its importance in handling, processing, and distributing meat

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[10] L. B. Mann, Refrigerated Food Lockers, Farm Credit Admin. Cir. No. C-107 (Washington, 1938).

[11] R. S. Euler, G. B. Wood, and J. R. Wiley, Frozen Food Storage for Indiana Families, Purdue University, Agri. Exp. Station Bul. 539 (Lafayette, 1950).

[12] J. S. Larson, et al., The Relation Between Locker Plants and Home Freezers in the Distribution of Frozen Foods in Arizona, Prod. and Mktg. Admin. (Washington, 1950).

[13] Marshall Heck, op. cit.

and other perishable food products. In addition, an attempt was made to delineate major problems and problem areas associated with the operation of individual locker plants and with the industry.

The analysis may furnish useful information for those interested in a more extensive use of frozen-food lockers and the services provided by frozen-food processing plants. Information relative to the capacity, charges, and services of frozen-food storage and processing plants may be helpful in (1) developing a more orderly marketing of farm products suitable for frozen-food storage, and (2) widening the market, lowering the cost of distribution, and increasing the consumption of frozen-food products.

Applications of the findings of the study are limited to Oklahoma, although they may be applicable to other areas which have similar population and agricultural characteristics. The accuracy of the results is limited to the degree of reliance which may be placed on information gathered through personal interviews with managers and owners of sample plants.

Procedure

Information for the study was obtained primarily from a representative sample of the total of all the frozen-food locker plants in Oklahoma during the summer of 1959. The location of the sample plants is shown in Figure 1.

A list of all of the plants believed to be in operation in the state of Oklahoma was obtained from the Food and Drug Division of the Oklahoma State Health Department. A total of 242 plants was listed. The entire population was then separated alphabetically into nine economic areas of

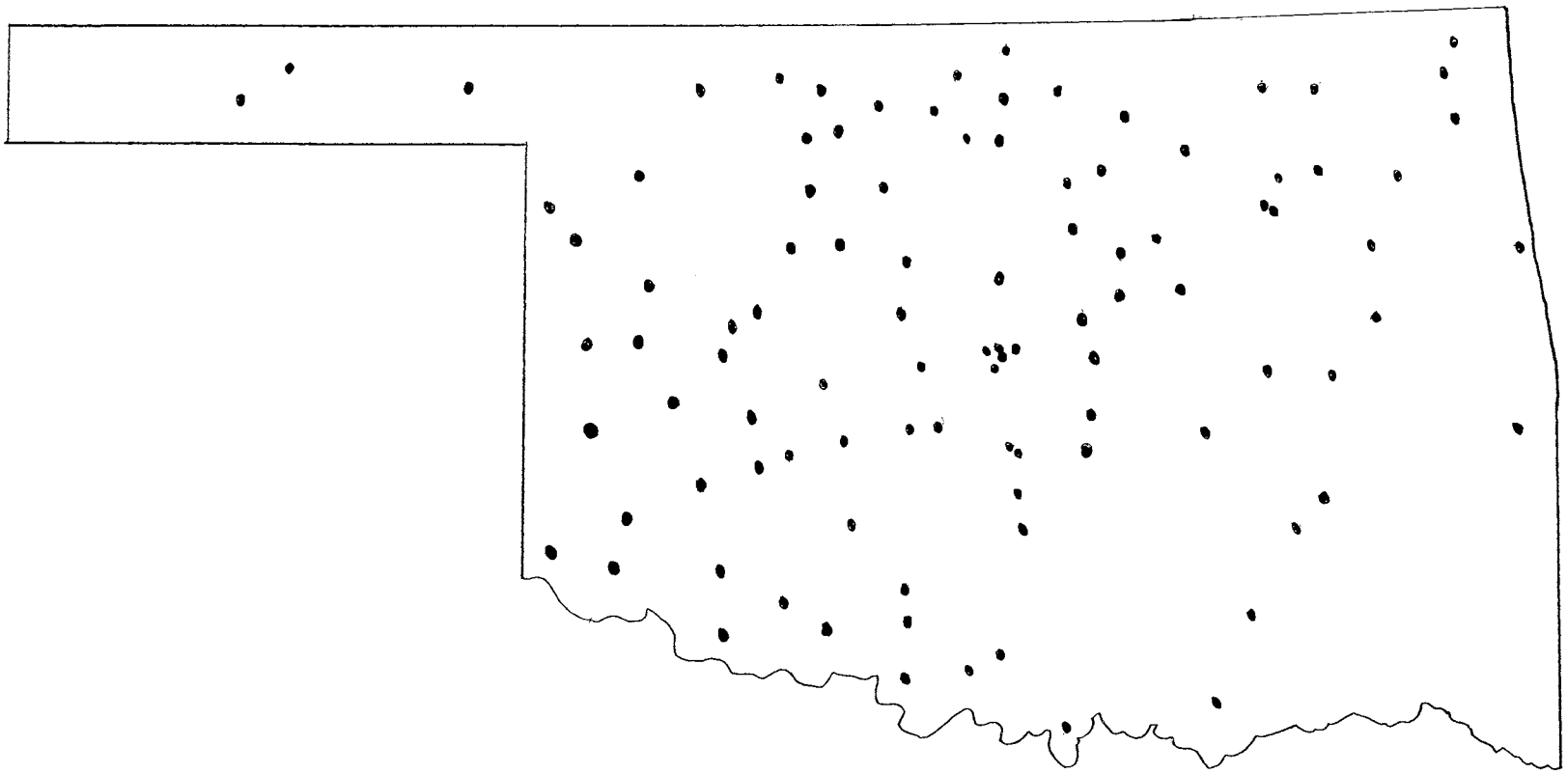

Figure 1. Location of Sample Locker Plants, Oklahoma, 1959.

the state. A random sample of 50 percent was drawn from this population. Under this sampling procedure no substitutions were permitted.

The questionnaires were completed for the sample plants by personal interviews with the plant owners or operators. Thirteen of the sample plants were no longer in business. Of the remaining 108 plants, only seven refused to supply the requested information.

For purposes of analysis, the sample plants were classified by groups according to their gross income (Table I). The gross incomes of the sample plants ranged from a low of $3,600 to a high of $950,000 per year. There were 50 plants in the lowest income group. Twenty-eight plants had incomes above $25,000 and 22 had incomes below $25,000 per year.

The plants in each of the income groups were further classified for purposes of analysis into two sub-groups: (1) plants that operated as locker plants only, and (2) plants that were operated in conjunction with some other business. The other major business enterprises used for this classification were grocery stores, meat markets (retail meat counter) and ice plants.

TABLE I. THE NUMBER AND PERCENTAGE DISTRIBUTION OF SAMPLE PLANTS BY INCOME GROUPS AND ECONOMIC AREAS, OKLAHOMA, 1959

Income Group ($1,000)	Area I		II		III		IV		V		VI		VII		VIII		IX		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
0- 50	7	50	10	53	3	38	10	56	9	50	2	66	3	43	5	50	1	25	50	49.5
51-100	3	21	4	21	2	25	3	17	2	11	0	--	1	14	2	20	1	25	18	17.8
101-150	1	7	4	21	0	--	4	22	1	5	0	--	1	14	0	--	1	25	12	11.9
151-200	0	--	1	5	1	12.5	0	--	2	11	0	--	0	--	2	20	0	--	6	5.9
201-250	0	--	0	--	1	12.5	0	--	0	--	1	33	1	14	0	--	1	25	4	3.9
251-300	2	14	0	--	1	12.5	0	--	1	5	0	--	0	--	0	--	0	--	4	3.9
301-1,000	1	7	0	--	0	--	1	5	3	17	0	--	1	14	1	10	0	--	7	6.9
Total	14	100	19	100	8	100.0	18	100	18	100	3	100	7	100	10	100	4	100	101	100.0

Source: Survey data.

CHAPTER II

CHARACTERISTICS OF THE LOCKER INDUSTRY OF OKLAHOMA

There was a tendency for locker plants to be associated with other businesses. Seventy-two of the 101 plants sampled were operated in conjunction with at least one other enterprise, usually a grocery store, meat market or ice plant (Table II). Twenty-nine percent of the sample plants were operated as locker plants only. Some operators stated that this was the only proper manner in which to operate the business. One operator, who previously had a grocery store in conjunction with his locker plant, related that on busy days locker patrons sometimes had to wait in line before they could be served. Furthermore, with his given plant layout, it was impossible to serve both locker patrons and grocery patrons in an efficient manner. Because of this situation, the operator sold the grocery portion of the business.

On the other hand, some operators stated that the income from the locker plant portion of the business was not sufficient to pay for the electricity used by the freezing units. One operator, who was operating a combined grocery store, meat market, and locker plant, stated that he considered the locker plant as merely a "calling card" for his other operations. That is when locker patrons removed goods from their lockers, they purchased groceries at the same time.

TABLE II. CLASSIFICATION OF SAMPLE PLANTS BY INCOME GROUPS, WITH AND WITHOUT OTHER ENTERPRISES, OKLAHOMA, 1959

Income ($1,000)	Total No.	Percent Of Total	With Other Enterprises		Without Other Enterprises	
			No.	Percent	No.	Percent
1-50	50	49.5	29	28.7	21	20.8
51-100	18	17.8	16	15.8	2	2.0
101-150	12	11.9	10	9.9	2	2.0
151-200	6	5.9	5	4.9	1	1.0
201-250	4	4.0	4	4.0	0	0
251-300	4	4.0	4	4.0	0	0
301-1,000	7	6.9	4	4.0	3	2.9
Total	101	100.0	72	71.3	29	28.7

Source: Survey data.

Buildings

Many of the locker plants in Oklahoma are located in buildings which were constructed several years previous to the establishment of the plants. Although most of these buildings originally were constructed to serve other purposes, no data was collected as to when the building itself was constructed. This was considered less important than the date at which the locker plant was established as a business.

The most rapid expansion of the locker plant industry in Oklahoma occurred during the period of the late 1930's and early 1940's. This expansion parallels the development of locker plants for the United States.

The number of plants which were either remodeled or established during the 21 year period, 1938-1951, are shown in Figure 2. "Remodeling" refers to (1) when the building was remodeled to establish a locker plant or (2) when the locker plant itself was remodeled. The owners or operators of 16 plants reported that some remodeling of their locker plants had occurred during the period 1953-1959. Only one of these 16 plants was not in business prior to 1953. This plant was built for the specific purpose of a locker plant business. The remaining locker plants reported some remodeling of existing facilities.

Seven of the sample plants were established or remodeled during the two-year period, 1958-1959. However, an additional six businesses indicated that they were planning to remodel. The remodeling plans for these six plants included enlargement of the chill-room or cold storage area, but none of the businesses planned to enlarge their locker capacity. Two businesses related that they intended to convert a portion of their present locker area into chill-room facilities. Several businesses reported that their chill-room facilities were not sufficient to properly chill the volume of carcasses received.

Materials

Eighty-five percent of the plants were constructed of masonry--including brick, cement block, stone or tile. Most of the remaining plants were of frame construction. The plants most recently remodeled or constructed were frame, stucco, or cement block structures.

Insulation

Cork was used as the major insulation material in 32 percent of the plants, 19 percent used rock wool, and 14 percent used some combination

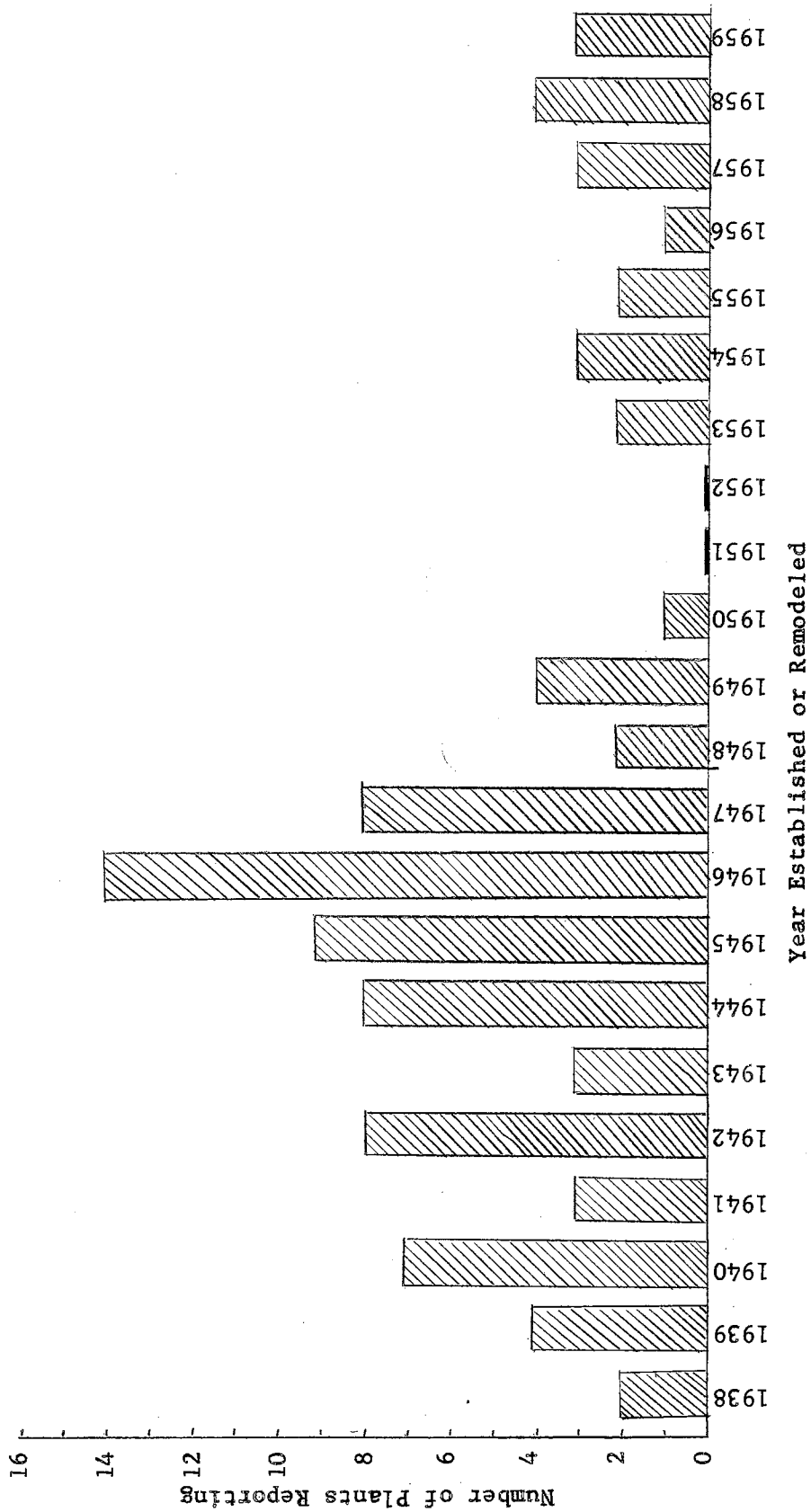

Figure 2. The Number of Sample Plants Reporting "Remodeling", Oklahoma, 1959.

of several insulating materials. Of the remaining 35 percent, 24 used fiber glass, palico wool or some other material. Eleven percent of the plant managers did not know what type of insulation had been used in their plants.

Plant Floor Space

An estimate was made of the total area of individual locker plants. In some of the sample plants that were operated in connection with a grocery store, the store was separated from the locker plant enterprise by a partition. In others, they were in the same area of the building. The estimate of the total area did not include any area except the one immediately adjacent to the locker plant itself, and included locker rooms, processing area, chilling rooms, and cooler.

The area of the locker rooms for the sample plants without other enterprises was greater than the area of locker rooms for sample plants with other enterprises (Table III). This could be because locker plants which are not operated in conjunction with other enterprises rely more on locker rentals than do plants which have other business operations contributing to their income.

Other Features

The two areas, locker rooms and total plant, were the only areas estimated in this study. Some plants had special rooms for receiving carcasses. These rooms were considered "receiving rooms" if the carcass could be placed in the chill room without having to be carried through the lobby or the front of the locker plant. Seventy-eight percent of the plants had a side or rear entrance for receiving carcasses.

TABLE III. AVERAGE AREA OF SAMPLE PLANTS AND LOCKER ROOMS, BY INCOME GROUPS, OKLAHOMA, 1959

Income ($1,000)	Number of Plants	All Plants	Plants Without Other Enterprises		Plants With Other Enterprises	
		Average Sq. Ft.	No. of Plants	Average Sq. Ft.	No. of Plants	Average Sq. Ft.
0- 50	50		21		29	
Building		5,303		4,725		5,753
Locker Room		810		753		852
51-100	18		2		16	
Building		4,622		9,625		3,997
Locker Room		936		2,716		714
101-150	12		2		10	
Building		5,138		10,275		4,110
Locker Room		702		1,008		641
151-200	6		1		5	
Building		6,242		7,200		6,050
Locker Room		1,133		1,890		982
201-250	4		0		4	
Building		4,307		--		4,307
Locker Room		1,761		--		1,761
251-300	4		0		4	
Building		9,163		--		9,163
Locker Room		1,224		--		1,224
301-1,000	7		3		4	
Building		11,107		9,000		12,688
Locker Room		1,211		1,167		1,245
Total	101		29		72	
Building		5,733		5,973		5,594
Locker Room		921		988		894

Source: Survey data.

Sixty-three percent of the sample plants had a system of rails extending from the exterior of the building to the chill rooms. In addition to the rails extending to an outside entrance, some plants were equipped with a hoist to minimize the effort of handling carcasses delivered to the plant.

Internal Features

Lockers

While there have been many changes in the external structure of locker plants and additional changes have been proposed, there also have been changes in the internal structure of some plants. Changes in the number of locker boxes available are shown in Table IV. When the plants

TABLE IV. AVERAGE NUMBER OF LOCKER BOXES PER SAMPLE PLANT, BY INCOME GROUPS, OKLAHOMA, 1959

Income ($1,000)	Number of Lockers					
	Originally		1954		1959	
	No.	Percent	No.	Percent	No.	Percent
0- 50	441	100	456	103.4	427	96.8
51-100	557	100	539	96.8	340	61.0
101-150	334	100	348	104.2	285	85.3
151-200	448	100	476	106.2	401	89.5
201-250	573	100	345	60.2	311	54.3
251-300	279	100	504	180.6	477	171.0
301-1,000	762	100	644	84.5	521	68.4
Total	470	100	470	100.0	397	84.5

Source: Survey data.

were first established there was an average of 470 locker boxes per plant. But by 1959 this number had decreased to 397.

Locker boxes in plants in the lower income group increased three and one-half percent during the period from establishment to 1954. However, since this date they have decreased sharply and for the entire period through 1959 they show a net decrease of four percent from the original number. In 1959 the average number of locker boxes for the 18 sample plants in the second lowest income group was only 39 percent of the average original number. In contrast locker boxes of sample plants for the next to the highest income group increased 71 percent above the original number. The majority of the plants visited had only one size of drawer and door-type locker but a few had different sizes, including half sizes for both drawer and door-type lockers.

Operations

In this section an effort is made to determine technical differences in individual plant operations.

Existing legislation requires that all food which is to be placed in lockers for storage must be either sharp frozen at the plant or in a solid frozen state when it is brought to the plant by the patron. A product is defined as sharp frozen when it has been frozen at a temperature of at least 10 degrees below zero (Fahrenheit), or this frozen state may be accomplished by maintaining a temperature of zero degrees when forced air is employed.[1] The law further states that each package

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[1] Oklahoma Frozen Food Locker Plant Act, Interpretive Code and Other Food Sanitation and Public Health Laws, Bureau of Sanitary Engineering, Oklahoma State Department of Health, O.D.H. Form No. 582 (Oklahoma City, 1945), pp. 22, 26.

shall bear the date when wrapped and proper locker number.[2] These are the major stipulations for checking frozen food into a locker for storage.

Twenty-three percent of the locker businesses indicated that they record the packages patrons remove from their lockers. Seventy-seven percent indicated that the major reason for not checking packages out of the plant was that this procedure was too expensive.

Considerable variation existed for the entire sample with respect to responsibility assumed by the business for spoiled or stolen patron-goods. Twenty-two percent of the businesses did not assume any responsibility for these losses, 23 percent indicated they assumed responsibility but did not carry any insurance to cover possible losses, and 55 percent were covered by insurance (Table V).

TABLE V. STATUS OF RESPONSIBILITY FOR PATRON PACKAGE LOSSES, SAMPLE PLANTS, OKLAHOMA, 1959

($1,000)	Responsibility for Losses					
	With Insurance		Without Insurance		Not Responsible	
	No.	Percent	No.	Percent	No.	Percent
0- 50	26	52.0	12	24.0	12	24.0
51-100	9	50.0	6	33.3	3	16.7
101-150	8	66.6	2	16.6	2	16.8
151-200	4	66.6	1	16.6	1	16.8
201-250	2	50.0	0	0	2	50.0
251-300	3	75.0	1	25.0	0	0
301-1,000	4	57.1	1	14.3	2	28.6
Total	56	55.4	23	22.8	22	21.8

Source: Survey data.

[2] Ibid., p. 28.

An attempt was made to calculate the cost of insurance for spoiled or stolen patron-goods. Most plant managers indicated they had no idea of the costs for this type of insurance since it was included in their overall insurance rate. However, a few plant managers quoted the cost of this insurance to range from 50 cents to one dollar per locker box per year. All plants reported that there had been little or no loss from theft or spoilage.

Business Organization

Several types of business organizations were represented in this study. The number of plants with an individual proprietorship type of business organization was greater than all other types combined. Seventy-eight plants were individual proprietorships, 13 were partnerships, and nine were corporations. Only one plant was organized as a cooperative (Table VI).

TABLE VI. RELATIONSHIP OF TYPE OF BUSINESS ORGANIZATION TO GROSS INCOME, SAMPLE LOCKER PLANTS, OKLAHOMA, 1959

Income ($1,000)	Individual		Partnership		Cooperative		Corporation	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
0- 50	40	80.0	4	8.0	1	2.0	5	10.0
51-100	15	83.3	2	11.1	0	0	1	5.6
101-150	11	91.6	1	8.3	0	0	0	0
151-200	3	50.0	2	33.3	0	0	1	16.6
201-250	2	50.0	1	25.3	0	0	1	25.0
251-300	4	100.0	0	0	0	0	0	0
301-1,000	3	42.8	3	42.8	0	0	1	14.2
Total	78	77.22	13	12.87	1	.99	9	8.91

The owners of 75 of the locker plants owned the buildings in which their plants were located. The remaining 26 plants were in leased buildings.

Services Offered

Table VII shows the number of plants, by income groups offering selected services. These services were selected on the basis of being typical of those offered by locker plants in Oklahoma.

Processing

In this study "processing" is defined to mean the preparation of food and food products primarily for freezing. It includes cutting and wrapping red meat, poultry, wild game, and wrapping fruits and vegetables.

TABLE VII. SAMPLE PLANTS OFFERING SELECTED SERVICES, BY INCOME GROUPS, OKLAHOMA, 1959

	Income $1,000								
Services Offered	0-50	51-100	101-150	151-200	201-250	251-300	301-1,000	Total Number	Percent of Total Sample
Processing									
Red Meat	50	18	12	6	4	4	7	101	100.0
Wild Game	39	14	10	5	4	2	6	80	79.2
Poultry	9	3	4	1	0	1	1	17	16.8
Slaughter	22	8	7	2	0	4	5	48	47.5
Sell Home Freezers	2	0	0	1	1	1	3	8	7.9
Sell Dry Groceries	11	13	10	4	3	3	3	47	46.5
Sell Meat Over Meat Counter	16	14	10	4	3	3	4	54	53.5
Slaughter for Resale	9	4	3	0	0	1	3	20	19.9
Sell Portion Control Meat	3	1	2	1	2	2	2	13	12.9

Source: Survey data.

If any of these types of food products are to be stored in frozen form, processing would also include sharp freezing. Processing is considered a separate service from slaughtering.

None of the plants in this study processed fruits and vegetables as a regular service, however all plants sharp freeze these products for storage at the request of patrons. In most plants poultry processing once accounted for a large portion of the total processing services performed, but this is no longer true. Only 17 of the sample plants processed poultry at the time of this survey.

Processing charges and the volumes processed per week for beef and pork varied considerably. Table VIII shows the average rates charged for

TABLE VIII. AVERAGE CHARGE AND POUNDS PROCESSED FOR BEEF AND PORK, BY INCOME GROUPS, SAMPLE PLANTS, OKLAHOMA, 1959

Gross Income ($1,000)	Processing	
	Average Number of Pounds Per Week	Average Charge
0- 50	2,877	.0457
51-100	2,079	.0455
101-150	3,333	.0483
151-200	2,683	.0500
201-250	10,013*	.0525
251-300	3,450	.0475
301-1,000	4,343	.0543
Total Average	3,184	.0472

*Includes one plant that processed 35,400 pounds per week.

Source: Survey data.

processing and the average number of pounds processed per week per plant. The range of charges for processing was from three to six cents per pound. Although one business charged three cents per pound, there were 14 businesses that charged six cents (Table IX). The majority of the plants

TABLE IX. DISTRIBUTION OF PROCESSING CHARGES FOR BEEF AND PORK, SAMPLE PLANTS, OKLAHOMA, 1959

Number of Plants	Processing Charge* (Dollars)
1	.030
1	.035
34	.040
10	.045
41	.050
14	.060
101 Total	

*Average charge for processing beef and pork. Only four plants reported a higher charge for processing pork than for processing beef.

charged between four and five cents per pound for processing beef and pork. The volumes processed ranged from 50 pounds to about 35,400 pounds per week (Table X). These were the extremes.

An attempt was made to determine what percent of the meat processed per week in Oklahoma was processed by locker plants. Since the total pounds of meat processed from cattle, calves, and hogs in Oklahoma was not available, a weekly estimate of this total was made. The 101 sample plants reported 319,815 pounds of meat processed per week. If all plants

TABLE X. NUMBER OF PLANTS AND AVERAGE POUNDS PROCESSED PER WEEK, SAMPLE PLANTS, OKLAHOMA, 1959

Number of Plants	Pounds Processed Per Week
17	0- 750
15	751-1,500
23	1,501-2,250
12	2,251-3,000
5	3,001-3,750
11	3,751-4,500
10	4,501-6,250
2	6,251-7,000
3	7,001-7,750
1	7,751-8,500
1	20,000
1	35,400
101 Total	

in the state were in proportion to the sample plants, the locker industry in Oklahoma processes approximately 690,745 pounds of beef and pork per week. This represents 12.27 percent of the estimated total for Oklahoma of 5,630,160 pounds. The details of the estimating procedure are shown in the Appendix.

Seventy-nine percent of the sample plants processed wild game. Generally speaking, this processing was confined to large game and did not include fowl or fish. The plant managers were in general agreement that they would like to eliminate this service. The most common reason given

was the extreme difficulty of preparing wild-game carcasses so that they would be fit for human consumption. Regardless of the condition of the carcass when received at the locker plant, the patron expected a palatable product when he removed the meat from the locker. In the event that the product did not suit the patron, the plant manager was blamed for the poor condition of the product. Consequently, many plant managers were anxious to discontinue this service.

The charge for processing wild game varied more than the charge for processing beef and pork. However, a few plants charged the same amount for processing wild game, but in the majority of the cases the rate charged for this service was about one and one-half cents per pound above the regular processing rate. In an attempt to discourage patrons from requesting this service one business charged ten cents per pound, but this high rate did not appreciably diminish the request for this service.

Curing and smoking services were available at most of the plants. This service was usually offered only in conjunction with curing pork. Eight plants did not offer curing and smoking services.

Slaughtering

Slaughtering is defined as the operation of killing and cleaning an animal, including viscerating, skinning or scraping, deheading and deshanking. Forty-eight of the sample plants slaughtered livestock. Forty-seven of these plants slaughtered both cattle and hogs and one plant slaughtered cattle only.

Table XI indicates the various charges made by sample plants for slaughtering beef. The charges were assessed by different methods and, as shown in this table, there were different levels of charges under

TABLE XI. BEEF SLAUGHTER CHARGES, BY INCOME GROUPS, SAMPLE PLANTS, OKLAHOMA, 1959

Income ($1,000)	Method of Charging: Per Head — Flat Rate — Number of Plants	Flat Rate — Charge Dollars	Per Head — Hide Plus Dollars — Number of Plants	Hide Plus Dollars — Charge Dollars	Per Head — Hide & Head — Number of Plants	Per Head — Hide Only — Number of Plants	Per Head — Hide Plus Offal or Heart & Liver — Number of Plants	Per Pound Dress Weight — Flat Rate — Number of Plants	Flat Rate — Charge Dollars	Per Pound Dress Weight — Flat Rate Plus Hide — Number of Plants	Flat Rate Plus Hide — Charge Dollars	Per Pound Live Weight — Straight Charge — Number of Plants	Straight Charge — Charge Dollars	Total Number of Plants
0- 50	6	3.08	8	2.50	2*	4	0	0	--	1	.015	1	.02	22
51-100	2	3.00	2	2.25	0	3	1	0	--	-	--	-	--	8
101-150	1	4.00	4	2.13	0	1	0	0	--	1	.02	-	--	7
151-200	0	--	2	4.25	0	0	0	0	--	-	--	-	--	2
201-250	0	--	0	--	0	0	0	0	--	-	--	-	--	0
251-300	1	3.50	1	3.50	0	1	0	1	.02	-	--	-	--	4
301-1,000	1	3.50	1	2.00	0	0	3	0	--	0	--	0	--	5
Total	11	3.23	18	2.61	2	9	4	1	.02	1	.02	1	.02	48

*Includes one plant which charged, in addition to the hide, $2.50 for light-weight beef.

Source: Survey data.

several of the methods. Eleven businesses charged a flat rate per head for slaughtering beef, and nine plants charged or received only the hide as compensation for slaughtering.

The charges assessed by 47 plants slaughtering hogs are shown in Table XII. There were fewer methods employed for assessing slaughtering charges for hogs than there were for beef. The reason for this is that the hide, head, and offal are not considered as valuable as they are for beef. While hog hides were not important in determining slaughtering charges, an increasing number of plants are receiving requests for hogs to be skinned rather than scraped.

TABLE XII. HOG SLAUGHTER CHARGES BY INCOME GROUPS, SAMPLE PLANTS, OKLAHOMA, 1959

Income ($1,000)	Method of Charging						Total Plants
	Per Head		Per Pound Live Weight		Per Pound Dress Weight		
	Plants	Charge	Plants	Charge	Plants	Charge	
	No.	Dollars	No.	Dollars	No.	Dollars	No.
0- 50	17	2.62	4	.0138	1	.015	22
51-100	5	2.70	2	.0125	1	.015	8
101-150	5	3.00	1	.0100	1	.020	7
151-200	1	3.00	-	--	-	--	1
201-250	0	--	-	--	-	--	0
251-300	2	3.00	1	.0100	1	.010	4
301-1,000	3	2.67	-	--	1	.030	4
Total	33	2.73	8	.0125	5	.018	46*

*The total number of plants does not agree with the total for Table XI since one plant slaughtered beef and did not slaughter hogs. Furthermore, one plant which slaughtered hogs for the offal only is not included in this total.

Slaughtering for resale usually implies that the plant has ownership of the live animal before it is slaughtered. Upon slaughtering, the meat is then sold to the customer. Only 20 plants slaughtered hogs and cattle with the intent of selling the meat. The animals which were slaughtered for resale were obtained from many sources, including farmers, stock yards, community sales, and small feed lots. One of the sample plants had integrated its operations backward to include feedlot operations. This particular plant owned a feedlot, fattened and slaughtered its own livestock and subsequently sold the meat to plant patrons.

Twenty-eight of the businesses which slaughtered livestock did not slaughter for resale. These plants, along with the non-slaughtering plants, obtained all their resale meat from packing houses. There were two general practices employed with respect to purchasing meat from packers. Some businesses ordered from packers only that amount of meat which their patrons requested. This method was a prevalent practice among those plants which wished to carry a very small unassigned meat inventory. Other plants preferred to carry a substantial inventory of carcasses. This practice enabled the business to offer customers an opportunity to select a carcass or portion of carcass for processing and storage in their locker or home freezer at any time.

Mobile Slaughterhouses

The mobile abattoir or slaughterhouse mounted on a truck makes it possible to slaughter an animal on the farm or ranch and hang the carcass in a 35 degree chill room immediately. This innovation has the potential of increasing the convenience of custom slaughter to farmer patrons and others. Their use also may result in a more sanitary and palatable

product. These advantages, plus the expansion of trade territory and the potential volume of meat for processing, have been of direct benefit to consumer patrons and locker plant businesses. The increased volume may result in lower processing costs as well as a higher quality product for the consumer.

Other Services

Portion-Controlled Meat

Portion-controlled meat refers to packaged meats of the same kind and weight. Locker businesses reported that many of their customers preferred portion-controlled meat because it assured them that all cuts would be of uniform size, weight and about equal in quality. Restaurants have bought portion-controlled meat from packers for many years. This type of packaged meat is relatively new to the locker industry of Oklahoma, especially in the frozen form. Although only 14 of the businesses reported that they sold portion-controlled meat, most of these indicated that this service had become popular with their patrons.

The owner-manager of one plant reported that portion-controlled meat accounted for 53 percent of his gross income. This plant wrapped and froze packages containing specific numbers of steaks and sold them to the public for charcoal broiling. Hamburger patties also were packaged and sold in this manner. The managers of several plants stated that the preparation and sale of portion-controlled meat is a service that is profitable to the plant and highly popular with customers.

Bulk-Food Purchases

In some instances the financing arrangements involved formal credit terms, in others they did not. Where formal credit terms were used, carrying and interest charges were usually included. Where credit was extended for periods greater than 30 days, the usual arrangement for farm patrons was from harvest to harvest. In these cases no interest or carrying charges were attached.

Many businesses offer bulk-food or home freezer food plans. In this study 20 plants financed bulk-food purchases for a period longer than 30 days (Table XIII).

TABLE XIII. NUMBER AND PERCENT OF SAMPLE PLANTS REPORTING FINANCING FOOD PURCHASES, BY INCOME GROUPS, OKLAHOMA, 1959

Income Group ($1,000)	Number	Percent
0- 50	8	16
51-100	3	16.7
101-150	0	0
151-200	2	33.3
201-250	1	25
251-300	1	25
301-1,000	6	85.7
Total	21	20.7

Source: Survey data.

Delivery Service

Twenty-one of the sample plants offered customers some form of delivery service. Ten of these plants delivered "free" and the remaining 11 either required a minimum purchase to warrant "free" delivery or charged a flat rate for delivery.

Protective Garments

Protective garments were provided by all sample plants for patrons use before entering the locker room. However, the majority of the plant managers stated that customers seldom used them.

Home Freezer Sales

Although there has been an increase in the number of home freezer units pruchased by consumers, home freezers were sold in only eight of the 101 sample plants. These eight were distributed among most of the income groups. Two, however, were in the smallest income group and three were in the largest income group.

Gross Income Distribution

Plant managers were asked for an estimate of their annual gross income for 1959. In some cases gross income was derived by adjusting 1958 income tax statements according to the amount of business conducted in 1959. In other cases it represents an estimate made by the manager. All 81 businesses that sold packer meat reported these sales in their gross income figure.

In some cases, no additional charge was made for handling packer meat and the gross income figures for sale of meat was actually a transfer of money from the customer to the packer. In other cases only a

small percent of the packer price was used as a mark-up to the customer. For this reason gross income for the 81 plants handling packer meat is over stated in relation to gross incomes for the 20 plants not handling packer meat.

Table XIV shows the percentage of income contributed by different services. Plants in the lowest income group received 18 percent of their gross income from locker rentals while the largest income group received only about one percent of gross income from this service. Processing services contributed almost 37 percent to gross income for the plants in the lowest income group compared with only 3.59 percent for the largest income group. Income from the sale of wholesale meat and from the sale of carcass meat account for a large percent of the total income for plants in all groups.

Some services are grouped together in Table XIV. This was necessary because certain plants were unable to estimate how mcuh income was contributed by the component parts of these combinations. In a few instances the grocery store operations included the meat market, although in most cases grocery store and meat market accounts were spearated from the accounts of other operations.

Gross income derived from services is classified according to single enterprise and multiple enterprise plants (Table XV). The percentage of gross income from locker rentals, slaughtering and processing generally was larger for single enterprise plants than for multiple enterprise plants.

In all but one income group, the amount of gross income contributed by processing is at least twice as great in the single enterprise plants

TABLE XIV. PERCENTAGE OF GROSS INCOME FROM SERVICES SAMPLE PLANTS, OKLAHOMA, 1959

Service	Income Groups ($1,000) 0-50	51-100	101-150	151-200	201-250	251-300	301-1,000	Average
	Percent							
Lockers Rented	18.10	4.52	4.00	2.68	1.34	1.94	1.04	10.72
Slaughter	12.80	5.60	6.72	2.01	--	2.91	.58	8.36
Processing	36.53	6.79	10.07	5.49	8.71	7.64	3.59	21.87
Wholesale Meat	29.16	12.70	10.75	28.55	5.25	40.28	38.85	24.62
Home Unit Sales	5.43	--	--	7.57	32.20	17.48	29.50	21.60
Frozen Portion Control Meat	27.88	11.00	--	--	--	--	--	22.25
Grocery Store	67.50	69.03	68.03	64.91	69.39	--	67.56	67.84
Meat Market	16.75	23.53	21.15	28.63	25.67	30.00	33.23	22.33
Ice Plant	28.48	51.69	--	15.13	32.00	10.49	--	29.57
Others*	7.69	31.37	17.17	8.95	--	20.50	--	16.90
Grocery Store and Meat Market Combined	90.85	93.64	87.90	85.00	--	95.53	74.60	90.72
Grocery Store, Meat Market and Others Combined	--	96.00	--	--	--	--	--	96.00
Grocery Store, Meat Market, and Ice Plant Combined	20.00	--	--	--	--	--	--	20.00
Locker Rentals and Processing Combined	--	4.87	--	--	--	--	--	4.87

*Included in these figures are incomes derived from hardware items, livestock feed, dry goods, ice cream sales rooms, and other enterprises not directly related to locker plant operations.

Source: Survey data.

TABLE XV. PERCENTAGE OF GROSS INCOME FROM SERVICES, BY ENTERPRISE CLASSIFICATION, SAMPLE PLANTS, OKLAHOMA, 1959

Income Group ($1,000)	Plants Reporting	Services								
		Locker Rentals	Slaughter	Processing	Wholesale Bulk Meat	Home Unit Sales	Grocery Store	Meat Market	Ice Plant	Others
	No.	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
0-50										
Single Enterprise*	21	23.91	18.26	52.64	30.13	--	--	--	--	6.32
Multiple Enterprise*	29	13.89	7.35	24.45	28.65	5.43	67.50	16.75	28.48	9.73
51-100										
Single Enterprise	2	12.00	--	17.50	15.00	--	--	--	--	57.50
Multiple Enterprise	16	3.45	5.60	5.26	12.45	--	69.08	23.53	51.69	5.24
101-150										
Single Enterprise	2	4.50	15.67	32.67	60.00	--	--	--	--	17.70
Multiple Enterprise	10	3.90	0.75	5.55	2.54	--	68.03	21.15	--	--
151-200										
Single Enterprise	1	4.63	--	2.60	75.37	--	--	--	--	17.40
Multiple Enterprise	15	2.29	2.01	6.06	16.85	7.57	64.91	28.63	15.13	0.50
201-250										
Single Enterprise	0	--	--	--	--	--	--	--	--	--
Multiple Enterprise	4	1.34	--	8.71	5.25	32.20	69.39	25.67	32.00	--
251-300										
Single Enterprise	0	--	--	--	--	--	--	--	--	--
Multiple Enterprise	4	1.91	2.91	7.64	40.28	17.48	--	30.00	10.49	20.50
301-1,000										
Single Enterprise	3	1.13	0.57	5.63	71.54	31.75	--	--	--	--
Multiple Enterprise	4	0.97	0.59	2.06	14.33	25.00	67.56	33.23	--	--

*In Chapter I the single enterprise plants are designated as "plants without other enterprises" and multiple enterprise plants are designated as "plants with other enterprises".

as in multiple enterprise plants. The single enterprise plants in the lowest income group obtained almost 53 percent of their income from processing. This group of plants received at least 20 percent more income from processing than plants in any other income group.

CHAPTER III

OPERATION OF LOCKER PLANTS

Selected Costs Involved in Locker Plant Operations

Hired Labor

The cost of hired labor varied greatly among plants. The number of businesses that hired either full-time or part-time employees is shown in Table XVI. Fifteen businesses did not hire any outside employment. Twelve of these plants were in the lowest income group and three were in the next to lowest income group.[1] Sixty-one businesses hired full-time personnel only and seven hired part-time personnel only.

The salaries of employees were highly variable. Salaries for full-time personnel ranged from $70 to $400 per month, with an average of $225 per month (Table XVII). The businesses in the highest income group paid the highest average monthly wage rate for hired employees. In contrast, businesses in the lowest income group paid the lowest monthly salary. Some full-time employees were paid by the week. Part-time employees were paid either by the hour or by the week.

Electricity

The cost of electricity varied with the source of power and the size of locker-plant operation (Table XVIII). While electricity costs were separated by power sources, no significance could be attached to the

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[1] Outside employees refers to employees other than hired managers, owners, and family help used in the plant operations.

TABLE XVI. THE AVERAGE NUMBER OF HIRED EMPLOYEES BY TENURE STATUS AND NUMBER OF PLANTS REPORTING, BY INCOME GROUPS, SAMPLE PLANTS, OKLAHOMA, 1959*

Income Groups ($1,000)	Full-Time Employees		Part-Time Employees	
	Plants Reporting	Employees Per Plant	Plants Reporting	Employees Per Plant
	No.	No.	No.	No.
0- 50	33	2	11	1
51-100	14	2	4	1
101-150	11	3	6	1
151-200	6	4	2	5
201-250	4	4	1	5
251-300	4	7	1	4
301-1,000	7	18	0	0

*These employees are exclusive of hired managers, owners, and family help used in the plant operation.

Source: Survey data.

TABLE XVII. AVERAGE WAGE RATE FOR HIRED EMPLOYEES BY INCOME GROUPS, SAMPLE PLANTS, OKLAHOMA, 1959

Income Groups ($1,000)	Method of Payment					
	Monthly		Weekly		Hourly	
	Plants Reporting	Average Wage Rate	Plants Reporting	Average Wage Rate	Plants Reporting	Average Wage Rate
	No.	Dollars	No.	Dollars	No.	Dollars
0- 50	31	206.94	2	34.50	7	.97
51-100	14	222.64	1	20.00	3	.83
101-150	11	207.91	2	36.00	2	.80
151-200	6	231.00	-	---	2	.85
201-250	4	253.25	-	---	1	1.00
251-300	4	241.50	-	---	1	.85
301-1,000	7	308.71	-	---	-	--
Average	77	225.26	5	30.17	16	.90

Source: Survey data.

TABLE XVIII. SOURCE AND RANGE OF MONTHLY COSTS OF ELECTRICITY, BY INCOME GROUPS, SAMPLE PLANTS, OKLAHOMA, 1959

Income ($1,000)	Source, Range, and Number of Plants							
	OG&E		Public Service		Municipal		Other	
	Plants No.	(Range) Dollars	Plants No.	(Range) Dollars	Plants No.	(Range) Dollars	Plants No.	(Range) Dollars
0- 50	20	65-300	14	60-500	12	60-250	4	70-200
51-100	6	75-210	8	65-500	2	80-400	2*	150
101-150	5	75-260	5	50-300	1	150	1	90
151-200	3	130-225	1	200	2	185-400	-	---
201-250	2	105-120	2	325-500	-	---	-	---
251-300	-	---	3	200-225	1	300	-	---
300-1,000	3	175-300	3	200-642	1	160	-	---

*One plant generated its own electricity but could give no cost estimates.

Source: Survey data.

differences of monthly costs between power sources even though the rates among power sources may be significantly different. The variation in the monthly cost of electricity for plants buying from a common power source may be attributed to differences in plant operations. Specific measurement of factors associated with these differences was not possible in this study, however, the differences appeared to be related to variation in the type and amounts of electrical equipment, volumes of meat and other products processed and frozen, quality and adequacy of insulation used in the plant, the frequency of locker room use, and other factors.

Sources of Income Other Than Slaughtering and Processing

Most locker businesses indicated they were attempting to decrease the number of locker boxes in their plants. As was indicated in Chapter II, some of these plants were using space gained through this action for additional processing and chill-room facilities. This was associated with the low income from locker rentals. Only 10 businesses reported that all of their lockers were rented at the time of the survey.

Although the income from locker rentals accounted for only 10 percent of the gross income for all plants sampled, the income from this source was a significant part of total income for some plants. For example, the 50 plants in the lowest income group derived about 24 percent of their income from locker rentals. Table XIX shows the average number of locker boxes available and the average number rented by all plants in the sample. The average number rented is an estimate by the manager of the locker boxes which he is able to keep under rental contract with patrons during a period of one year.

TABLE XIX. AVERAGE NUMBER OF LOCKERS AVAILABLE AND RENTED, BY INCOME GROUPS AND ENTERPRISE CLASSIFICATION, SAMPLE PLANTS, OKIAHOMA, 1959

Income Groups ($1,000)	All Plants		Single Enterprise Plants		Multiple Enterprise Plants	
	Available	Rented	Available	Rented	Available	Rented
	No.	No.	No.	No.	No.	No.
0- 50	427	278	400	264	446	289
51-100	340	236	750	575	289	194
101-150	285	198	500	399	242	158
151-200	402	290	800	680	322	212
201-250	311	207	---	---	311	207
251-300	477	346	---	---	477	346
301-1,000	521	405	417	357	599	442
Total	397	270	447	319	377	251

Source: Survey data.

The average number of lockers available and rented by single enterprise plants was considerably larger than the average number available and rented by plants with multiple business operations. The plants which were operated strictly as locker plants only rented an average of 71 percent of all available lockers , all other plants rented an average of 67 percent. For all plants, both single and multiple enterprise, rentals averaged 68 percent of the locker boxes available.

There was a wide variation among plants with respect to the rental of emergency locker space to home freezer owners. However, all plants reported that space was made available to home freezer owners in the event of emergency situations.

Sixty-eight percent of the businesses reported the same monthly rates for emergency locker space for home freezer owners and overflow space for patrons with a locker. Twenty-two percent of the businesses charged different rates for these two types of patrons. Six of the remaining 10 plants allowed home freezer owners to place goods in lockers free of charge for a limited time in the event of an emergency.

The charges for locker boxes were not as variable as were emergency and overflow charges. Table XX indicates the average charges for locker boxes on an annual basis. The average for all plants was $12.20 for door-type lockers and $14.61 for drawer-type lockers. All businesses charged

TABLE XX. ANNUAL AVERAGE CHARGE FOR LOCKERS, BY INCOME GROUPS, SAMPLE PLANTS, OKLAHOMA, 1959

Income Groups ($1,000)	Average Charge Reported	
	Door Type	Drawer Type
	Dollars	Dollars
0- 50	11.84	14.42
51-100	12.03	14.89
101-150	12.09	14.62
151-200	12.04	13.69
201-250	12.53	15.78
251-300	12.37	15.46
300-1,000	15.31*	14.92
Total Average	12.20	14.61

*At the time of this study one plant was charging $36.00 for door-type lockers.

Source: Survey data.

a lower price for door type than for drawer-type lockers when both were available. One plant charged $36.00 per year for door-type lockers. The manager of this plant stated that he wished to quit renting lockers and thought this high price would eliminate customers from using this service.

Although the majority of the plants were equipped with both door and drawer-type lockers, in most instances the drawer-type boxes were rented on an annual basis and the door type were used for overflow and emergency uses.

Managerial Problems

In this study an attempt was made to determine the major problems confronting managers in the operation of the locker plant business. The managers were requested to list all of the major problems which they considered important. The problems most frequently indicated were chain store preparation and sales of "locker-prepared meat", the substitution of home freezers for locker rentals, the implemenation of changes in processing rates (Table XXI).

"Locker-Prepared Meat"

Paragraph 324.12 of the Frozen Food Locker Plant Act, as amended, states: "No food shall be placed in a locker for storage unless it has been sharp frozen at the plant or else transferred from home freezer in a solid frozen condition. No foods shall be placed in a locker unless such foods have been inspected by the operator. No unwrapped meat or unwrapped or unpacked fruits or vegetables shall be placed in any locker. Only paper suitable for the wrapping of meats that are to be frozen and

TABLE XXI. MAJOR PROBLEMS INDICATED BY MANAGERS, BY INCOME GROUPS, SAMPLE PLANTS, OKLAHOMA, 1959

Problem	Plants in Each Income Group ($1,000)							
	0-50	51-100	101-150	151-200	201-250	251-300	301-1,000	Total
"Locker-Prepared Meat"	13	3	5	1	1	2	2	27
Substitution of Home Freezers for Lockers	16	4	5	1	1	0	1	28
Processing Rates	10	5	4	1	0	1	0	21
Miscellaneous Problems	24	4	4	1	0	1	2	36

Source: Survey data.

stored, shall be used. Each wrapped portion shall be marked or stamped with the correct locker number and the date of wrapping."[2]

Chain stores selling fresh meat frequently advertise "home freezer" or "locker-prepared meat," and often at attractive prices. The prices quoted usually include cutting and wrapping, and in some instances it is implied that sharp freezing is also included. Patrons who purchase "locker-prepared meat" from chain stores, or other vendors of "locker-prepared meat", may find that their purchases do not meet the provisions of paragraph 324.12 as specified above. Consequently, patrons bring pressure to bear upon plant managers to accept these purchases without an additional charge for inspection and sharp freezing, which is required by law.

[2] Oklahoma Statutes Annotated, Permanent Edition, Titles 63-67, "Public Health and Safety Records" (St. Paul, 1959), p. 49.

Twenty-seven plant managers reported that they had experienced problems associated with "locker-prepared meats" from other sources. Significantly, these plants were located in or near a large city. These problems were of two major types: (1) the quality of packaging and sharp freezing, and (2) declining incomes from processing and locker rentals. Both of these are acute public-relations problems for locker plants in Oklahoma.

Since chain stores and other non-locker plant businesses are not licensed under the Locker Plant Act, the responsibility for policing frozen foods stored in locker plants is placed upon individual plant managers. Under the existing law, plant managers have the authority to reject improperly wrapped or frozen packages or to require that these packages be rewrapped and sharp frozen at the customer's expense if stored in the locker plant.

Economy minded consumers substituting purchases of "locker-prepared meats" not processed and sharp frozen by locker plants directly affect processing volumes of locker plants. When these purchases are stored in home freezers they also affect locker rentals. Declining volumes of processing and locker rentals directly associated with these practices result in higher unit costs per plant operations. Some plants have attempted to adjust to this situation by substituting additional chill-room and processing space and services for surplus lockers and locker space.

The managers of 28 plants expressed the view that home freezers were harmful to the locker plant industry. For the most part, these owners or managers were those who had experienced a decrease in locker rentals and lower volumes of meat for processing. However, many plant

managers expressed the view that the more extensive use of home freezers for meat storage had increased the volume of meat processed by locker plants. Moreover, these managers indicated that home freezers not only had increased the volume processed, but they also had resulted in more continuous volume of meat throughout the year. Several of the plant owners and managers were of the opinion that the increase in revenue from additional processing was more than sufficient to offset any income losses caused by a decrease in locker rentals.

Processing Rates

Twenty-one plant managers stated that meat processing rates currently in effect were too low to cover costs of processing. These managers all indicated they would like to raise their rates but were reluctant to do so because they were afraid many of their customers would take their meat elsewhere for processing, especially if a nearby competitor did not change his rates at the same time.

In this study no attempt was made to determine processing costs. However, if these costs would have been found to be sufficiently high to justify an increase in rates for these 21 plants, a raise in rates might not be a solution to this problem. The heterogeneous characteristics and operating practices of the locker plant businesses in this study suggest that some plants may be able to process meat for storage in frozen food lockers or home freezers at a lower rate than other plants.

Miscellaneous Problems

Most items in this classification could be described as technical problems. "Processing failures", while not extensive, were a problem

common to several plants. The "failures" included customer complaints of freezer burn, off taste of the products, and a generally non-palatable product.[3] Actually, freezer burn is the only one of these three failures which is a processing failure. The remaining "failures", off taste and a generally non-palatable product, may more accurately be described as complaints of the quality of the original product and may or may not be a result of processing.

The managers or owners of eight plants indicated that their major problem was that of maintaining their insulation and refrigeration equipment.

Sixty-three percent of the managers expressed an interest in a "locker plant short course" and said that they would either attend or send an employee of the plant to such a short course if it were to materialize and be held in Oklahoma.

Customers' Use of Locker Plants

Farm patrons composed almost 70 percent of the patrons of the sample plants.[4] As indicated in Table XXII, the plants in the smallest income group had 80 percent farm patrons. The smallest percent of farm patrons was in the $201-250 thousand income group.

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[3] Freezer burn is the dehydration of a product caused by direct contact with the air while the product is in a frozen state. Freezer burn can be eliminated by wrapping the product with air tight wrapping material

[4] Farm patrons in this study refer to patrons who live on a tract of land outside of town and who are capable of raising livestock.

TABLE XXII. PERCENTAGE DISTRIBUTION OF FARM AND NON-FARM LOCKER PATRONS, AVERAGE LOCKER USE BY PATRONS, AND AVERAGE TRADE AREAS BY INCOME GROUPS, SAMPLE PLANTS, OKLAHOMA, 1959*

	Income Groups ($1,000)							
	0-50	51-100	101-150	151-200	201-250	251-300	301-1,000	Total
Percent of Patrons Per Plant:								
Farm Families	80.34	67.61	74.58	47.83	27.50	73.75	34.29	69.91
Non-Farm Families	19.66	32.39	25.42	52.17	72.50	26.25	65.71	30.10
Average Number of Lockers Rented:								
Farm Families	1.24	1.31	1.23	1.33	1.25	1.00	1.11	1.23
Non-Farm Families	1.07	1.06	1.08	1.00	1.18	1.25	.89	1.06
Average Trade Area Radius (Miles)	22.44	18.39	21.42	24.50	14.00	21.25	37.86	22.40

*The figures in this table are all weighted averages of plants reporting.

Source: Survey data.

The number of farm patrons of each plant has some effect on the services which are used most extensively by all patrons. In every income group except one, farm patrons rented more lockers per family per year than did non-farm patrons. These estimates included over-flow lockers rented by the month as well as on an annual basis.

While the average number of lockers rented by farm patrons was significantly different from non-farm patrons, there was no apparent difference in the products stored in the lockers by the two types of patons. In the majority of the sample plants, beef and pork were the principal items stored.

Managers were requested to estimate the number of farm and non-farm patrons who owned home freezers. These estimates indicated that 50 percent of the farm patrons and 34 percent of the non-farm patrons owned home freezers. This may account for part of the difference in the services used most frequently by farm and non-farm patrons. The greater part of the dollar expenditures by farm patrons was for processing and slaughtering services. However, most of the dollar expenditures by non-farm patrons was for the payment of locker rental and processing charges.

Farm patrons rented more lockers per family per year than non-farm patrons, but largest volume of the non-farm business was through locker rentals. However, no comparison was made between farm and non-farm patrons with respect to dollar expenditures for each separate service.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The popularity and growth of frozen food locker and processing plants in the United States may be attributed to several factors. Some of these factors are the decentralization of livestock markets and the meat packing industry, the development and availability of refrigeration equipment, the need for food storage during World War II, and the general acceptance of frozen foods by the American public.

During the ten-year period, 1949-1959, the number of locker plants in Oklahoma decreased. The operations performed by these plants have also changed. The majority of the locker plants have decreased, or are in the process of decreasing, the number of locker boxes available for rent. Some plants have eliminated certain other services, including poultry slaughter, curing and smoking, and in a few cases locker boxes.

The charges for locker rentals were about the same for all plants in the sample. However, the charges for other services were highly variable. The charge for processing ranged from three to six cents per pound, and the charge for slaughtering varied from a flat rate per head to a rate per pound dressed-weight plus other compensation. Many plant operators and owners expressed the opinion that the charges for processing were too low, but they were hesitant to increase these rates because of potential losses that might occur.

The number and salary of employees varied greatly within as well as between income groups. Generally speaking, the plants in the higher

income groups had a greater number of employees than plants in the lower income groups. The monthly cost of electrical power was directly related to the size of plant operation.

A significant percentage of the patrons of locker plants in this study were farm patrons. A higher percentage of farm patrons than non-farm patrons owned home freezers. Farm patrons also rented a larger number of locker boxes per family.

Patrons' expenditures for processing were greater than their expenditures for any other service. The amount of processing by locker plants in this study, expanded to the total population of all plants in Oklahoma accounted for about 12.27 percent of the total red meat processed in the state.

The changing structure of locker plant businesses in Oklahoma suggests that this industry is shifting from a locker plant industry to a meat and food processing industry. The present laws under which this industry is now operating are not adequate to meet the problems arising from this changing structure. However, many plant managers believe that some of their problems can be solved through more active and comprehensive participation within the locker plant industry. Over 60 percent of the plant managers in this study indicated they would be interested in a school or short course for this purpose.

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APPENDIX

Procedures Used in Estimating the Percentage of Beef and Pork Processed by Oklahoma Locker Plants

The data used for computing the estimates in this section were taken from the January 29, 1960, issue of Commercial Livestock Slaughter and Meat Production.[1]

The estimates of total meat processed by sample locker plants were for beef, veal and pork only. Expansion of these estimates to include all locker plants in Oklahoma, as defined in this study, assumes that the sample plants, with respect to volumes of meat processed, were representative of all locker plants in Oklahoma.

TABLE I. TOTAL LIVE WEIGHT SLAUGHTERED FOR OKLAHOMA

Class of Livestock	January-December (1,000 Pounds)	Per Week
Cattle	262,177	5,042
Calves	35,389	681
Hogs	173,783	3,342

TABLE II. TOTAL LIVE WEIGHT SLAUGHTERED FOR UNITED STATES

Class of Livestock	January-December (1,000 Pounds)	Per Week
Cattle	23,277,730	447,649
Calves	1,665,171	32,023
Hogs	19,307,434	371,297

[1] Commercial Livestock Slaughter and Meat Production - December, 1959, AMS, Crop Reporting Board, MtAn 1-2 (1-60) (Washington, D. C., 1960).

Percent of total slaughter by Oklahoma: $\frac{\text{Live Weight Okla.}}{\text{Live Weight U. S.}} = \%$ of total

$\frac{5,042}{447,649} = 1.126\% = C_1$ (Cattle) $\qquad \frac{681}{32,924} = 2.127\% = C_2$ (Calves)

$\frac{3,342}{371,297} = 0.900\% = C_3$ (Hogs)

TABLE III. TOTAL DRESSED WEIGHT, MEAT PRODUCED, UNITED STATES

Class of Livestock	January-December (Million Pounds)	Per Week (Million Pounds)
Beef	13,245	255
Veal	943	18
Pork and Pork Products[1]	13,741	264

[1] Includes lard and rendered pork fat.

The percentage estimates derived from Tables I and II for each class of livestock used in computing the estimates for total dressed weight of meat produced for Oklahoma, assume that the dressing percentages of livestock in these groups are not significantly different for Oklahoma and the United States.

Table III indicates the total dressed weight for the three classes of livestock for the United States. The January-December totals were converted to weekly estimates. Table IV combines the weekly estimates from Table III and the percentage estimates made from Tables I and II to provide the weekly estimates for the three groups of meat products for Oklahoma.

Assuming that the 46.3 percent sample is a reasonably accurate estimate, and that the reported estimate of 315,815 pounds of beef and pork

processed by sample plants is reasonably correct, the total amounts of beef and pork were expanded to include all locker plants as follows:

$$\frac{319,815 \text{ (Pounds of Beef and Pork)}}{46.3 \text{ (Sample Percentage)}} \times 100 = 690,745 \text{ pounds processed per week by the Oklahoma Frozen Food Locker Industry.}$$

Therefore: $\frac{0.690745}{5.63016} = 12.27\%$ of the total pounds of beef and pork processed in Oklahoma is processed by the locker plant industry. This assumes that all meat produced in Oklahoma is also processed in the state.

TABLE IV. TOTAL DRESSED WEIGHT, MEAT PRODUCED, OKLAHOMA (CALCULATED)

Class of Livestock	Per Week U. S. (Million Pounds)	Oklahoma % of U. S. (C_i)	Per Week Oklahoma (Million Pounds)
Beef	255	1.126% (C_1)	2.87130
Veal	18	2.127% (C_2)	.38286
Pork and Pork Products	264	.900% (C_3)	2.37600
			Σ = 5.63016

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