

DEVELOPMENTS IN THE KANSAS LIVESTOCK AND MEATPACKING  
INDUSTRIES

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by

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## CHAPTER I

### INTRODUCTION

Number of meat packing plants in the United States has increased steadily since the turn of the century, with exceptionally rapid increases occurring during World War Two.<sup>1</sup> In the period from 1950 to 1954, total numbers of plants dropped slightly, with a relatively large reduction in medium sized plants offsetting an increase in large federally and non-federally inspected plants. (Table 1)

This increase in numbers of large federally and non-federally inspected plants, in contrast to smaller ones, would appear to be the result of two trends, the growth of local plants into medium sized and larger plants, and the shifting of the larger plants into federal inspection. Hence, it is also probably true that a larger proportion of federally inspected plants in 1964 were independently owned contrasted to the early post war years.

Since the end of World War Two, the number of packing plants operated by the national packers has declined. Two of the largest firms have gone through retrenchment programs in which some plants were closed and others declined in value.<sup>2</sup> A marked trend towards geographic decentralization has been evident for many years, and has become particularly strong since the development of truck transport and mechanical refrigeration. Slaughter

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<sup>1</sup> Williams, Willard F., "Structural Changes in the Meat Wholesaling Industry," Journal of Farm Economics, Vol. XI, May, 1958, p. 317.

<sup>2</sup> Ibid.

TABLE 1. — Number of meat packing plants by type, selected years, United States<sup>a</sup>

Type of plant	Year			
	1950	1955	1960	1964
Federally inspected	441	455	530	575
Large <sup>b</sup>	725	952	902	930
Medium <sup>c</sup>	2,072	1,810	1,712	1,635

<sup>a</sup> Source: United States Department of Agriculture, "Number of Livestock Establishments," (March 1, 1950, 1955, 1960, 1964)

<sup>b</sup> Includes non-federally inspected plants slaughtering over 2 million pounds liveweight per year.

<sup>c</sup> Includes non-federally inspected plants slaughtering less than 2 million, but more than 300,000 pounds per year.



volumes in what were once major meat packing centers, Chicago, Boston, and other large metropolitan centers, have dropped sharply, as livestock slaughter has moved back towards the production areas. As indicated by Lord,

The large war and post war movement of population, the emergence of the modern chain store, the greater reliance upon refrigerated truck transport (which in turn has caused a decentralization of plants away from the markets and towards the sources of supply), the rise of the small independent packer have all conspired to make the meat packing industry one of the most competitive in the country's contemporary scene.

Concentration in the meat packing industry has tended to become less marked over much of the last half century, and, since 1940, the four leading firms have accounted for a steadily decreasing percentage of total slaughter of livestock.<sup>4</sup> Thus it is apparent that there may be possible advantages held by smaller firms under certain conditions. Technological innovations and smaller immediate markets have apparently allowed for greater efficiency in the smaller plants, particularly those containing purely slaughter and cooling facilities, and doing relatively little processing. Capital needs for this type of operation appear to be relatively low, and therefore do not represent a barrier to the entry of firms. As much of the cutting up is handled by retailers, product differentiation is not possible to any large degree.<sup>5</sup>

Consequently, while the four leading firms are still the major producers within the industry, they are mainly so because of the degree of integration they have attained, as in the increased volume of processed pork, and because many of the other areas in which they have expanded such as fertilizers, pharmaceuticals, chemicals, soap, livestock feeding supplements and dog foods

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<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

have been fairly successful.<sup>6</sup>

The competitive relationships within the industry have also changed considerably. On one side, the meat packer has had to face growing concentration in regard to the retail chain stores, the influence of the buyer depending upon the control of the retail chain in terms of purchases of supply and foodstuffs. The result has been the development of a complex market with a large and increasing volume of interregional movement of dressed carcasses, and interregional arbitraging by both independent brokers and retailers. On the other side, meat packers have had to face increased concentration on the part of producers. Large volume feed lots have increased rapidly in number, and their operators are well informed and astute bargainers. The extent to which meat packers have been able to integrate in both directions has not been large.<sup>7</sup>

The meat packing industry is an important source of income and employment to the state of Kansas. In 1963, as indicated in Table 2, 8,070 people out of a total working force of 113,623 people employed in all manufacturing in Kansas were employed in the meat packing industry. Wages and salaries paid to packing plant workers in 1963 in Kansas totalled \$54.2 million, 11.7 percent of value of all wages and salaries paid in the manufacturing industries. Total value added by manufacture in the industry in 1963 was \$74.5 million, 5.2 percent of value added to manufacture by all manufacturing industries in the State of Kansas.

Kansas ranked eleventh in meat packing in 1963 among all states. As indicated in Table 3, however, this is somewhat of a decline since 1947

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<sup>6</sup> National Commission on Food Marketing, "Organization and Competition in the Livestock Industry," Technical Bulletin No. 1, (Superintendent of Documents, United States Government Printing Office, June, 1966) p. 17.

<sup>7</sup> Williams, op. cit., p. 329.

TABLE 2. — Selected statistics, the meat packing industry and all manufacturing industries, Kansas, census years, 1947-63<sup>a</sup>

Year	All employees	Production workers	Salaries and wages paid	Value added	New capital expenditure
	number		millions of dollars		
All industries					
1947	74,634	59,370	204.8	461.1	n.s
1954	131,017	98,187	558.5	1,049.3	53.0
1958	117,964	86,461	586.6	1,171.0	77.9
1963	113,623	84,322	461.0	1,436.9	86.8
Meat packing industry					
1947	13,241	10,661	37.5	49.2	2.1
1954	9,484	7,192	40.2	55.4	2.4
1958	8,122	6,098	43.2	62.4	2.6
1963	8,070	6,191	54.2	74.5	2.0

<sup>a</sup> Source: United States Department of Commerce, Bureau of the Census, "United States Census of Manufactures, Meat Products," Industry Report MC 58 (2) -20A, (Superintendent of Documents, United States Government Printing Office, Washington, D.C., 1964)

TABLE 3. -- Relative importance of Kansas in meat packing, selected years<sup>a</sup>

Year	Rank	State	Value added by manufacture
			millions of dollars
1947	1	Illinois	126
	2	Iowa	93
	3	Minnesota	69
	4	Nebraska	61
	5	California	51
	6	Texas	50
	7	Kansas	49
1954	1	Iowa	155
	2	Illinois	136
	3	Minnesota	122
	4	Ohio	107
	5	California	80
	6	Texas	69
	7	Nebraska	67
	8	Kansas	55
1958	1	Iowa	217
	2	Minnesota	142
	3	Illinois	134
	4	Nebraska	110
	5	Ohio	107
	6	California	80
	7	Indiana	73
	8	Pennsylvania	73
	9	Texas	73
	10	Wisconsin	69
	11	Missouri	66
	12	Kansas	62
1963	1	Iowa	266
	2	Minnesota	143
	3	Ohio	110
	4	Illinois	100
	5	Nebraska	100
	6	California	96
	7	Texas	94
	8	Pennsylvania	78
	9	Wisconsin	78
	10	Indiana	75
	11	Kansas	75

<sup>a</sup> Source: United States Department of Commerce, Bureau of the Census, "United States Census of Manufactures, Meat Products, Industry Report MC 58(2) -20A, (Superintendent of Documents, United States Government Printing Office, Washington, D.C., 1964)

when Kansas stood seventh. The relative loss in position occurred primarily in the 1954 to 1958 period when a serious drought sharply curtailed livestock production in Kansas. Since 1958, the relative position of Kansas has shown important improvement, rising from twelfth in that year to eleventh in 1963.

The rank of Kansas as a meat packing state does not compare with its position as a livestock producer. As indicated in Table 4, Kansas ranked fourth in terms of liveweight production of cattle and calves, tenth in liveweight production of hogs, and fourteenth in liveweight production of sheep and lambs in 1963.

Kansas is an increasingly important contributor to the nation's livestock industry. As shown in Table 5, Kansas produced 1,138 million pounds liveweight of cattle in 1945, 16.5 percent of that produced in the West North Central states,<sup>8</sup> and 5.9 percent of total United States production. By 1955, although liveweight cattle production in Kansas had risen by 36.1 percent to 1,559 million pounds, the relative position of Kansas as a cattle producer had dropped slightly as a result of a series of dry years. Following the end of the drought in 1957, however, cattle production in Kansas rose steadily and strongly. By 1964 it totalled over 2,189 million pounds liveweight, 17.1 percent of liveweight cattle production in the West North Central states, and 6.5 percent of cattle production in the United States as a whole.

Somewhat the same trends are evident in the liveweight production of hogs in Kansas, as indicated in Table 5. In 1945, liveweight production of hogs totalled 472 million pounds, 5.2 percent of production in the West North Central states, and 2.4 percent of production in the United States. By 1955

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<sup>8</sup> Includes Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.

TABLE 4. — Relative importance of Kansas in producing livestock, 1945-1965<sup>a</sup>

Year	<u>Rank among all states, liveweight production</u>		
	Cattle and calves	Hogs	Sheep and lambs
1945	3	10	13
1946	4	11	13
1947	4	11	15
1948	4	13	16
1949	3	12	15
1950	4	12	11
1951	4	10	15
1952	4	10	16
1953	4	12	17
1954	3	12	18
1955	4	13	19
1956	3	16	17
1957	4	16	17
1958	5	14	14
1959	4	14	15
1960	4	14	14
1961	4	11	14
1962	4	10	14
1963	4	10	14
1964	4	10	12
1965	4	10	13

<sup>a</sup> Source: Kansas State Board of Agriculture, "Annual Reports," 1945-46 to 1965-66.

TABLE 5. -- Liveweight production, Kansas, West North Central states, and the United States, 1945-1964<sup>a</sup>

Year	Cattle and calves			Hogs			Sheep and lambs		
	Kansas	West North Central	United States	Kansas	West North Central	United States	Kansas	West North Central	United States
million pounds									
1945	1,138	6,984	19,345	472	8,766	19,095	58	471	1,191
1946	1,075	6,632	18,982	438	8,630	19,095	56	427	1,763
1947	1,113	6,754	19,055	400	8,626	18,667	43	381	1,579
1948	1,207	6,211	18,371	369	8,384	18,739	37	333	1,404
1949	1,163	6,700	19,352	407	9,302	20,190	35	303	1,310
1950	1,201	7,096	20,488	449	9,427	20,001	49	303	1,331
1951	1,345	7,586	21,889	502	10,237	21,308	38	312	1,251
1952	1,430	8,133	23,491	402	9,326	20,013	37	339	1,409
1953	1,531	9,039	25,561	285	8,268	17,625	31	343	1,443
1954	1,543	9,282	26,156	310	9,159	19,085	38	365	1,510
1955	1,559	9,950	28,402	341	9,774	19,973	36	400	1,612
1956	1,543	9,710	27,855	312	8,665	18,833	39	406	1,564
1957	1,178	9,313	27,058	304	8,571	18,617	40	421	1,525
1958	1,324	9,687	27,874	337	9,272	19,421	47	438	1,620
1959	1,560	10,464	29,546	402	10,130	21,442	46	456	1,676
1960	1,468	9,893	28,706	385	8,938	18,989	39	455	1,640
1961	1,664	10,312	29,688	467	9,763	20,216	47	452	1,688
1962	1,721	10,544	30,333	503	9,843	20,345	41	413	1,537
1963	1,962	11,628	32,328	528	10,213	20,729	41	385	1,461
1964	2,189	11,989	33,934	521	10,067	20,304	39	364	1,349

<sup>a</sup> Source: United States Department of Agriculture, "Agricultural Statistics," (Superintendent of Documents, United States Government Printing Office, Washington, D.C.)

liveweight production of hogs in Kansas had fallen to less than two thirds of its previous level. As with cattle, however, a strong upward trend in the liveweight production of hogs occurred after 1957, and by 1964 production had risen to 521 million pounds liveweight. While producing only 4.5 percent of total liveweight production of hogs in the West North Central states, Kansas produced 2.6 percent of the national total, and had in effect increased its position relative to the others as a hog producing state over this period.

Almost the opposite trend has occurred in the production of liveweight sheep and lambs than has been the case for cattle and hogs in Kansas. As indicated in Table 5, sheep production has tended to decline, dropping from 55.7 million pounds in 1945 to 39.1 million pounds in 1964. While Kansas has improved its position relative to other West North Central states, its proportion of United States production has dropped from 4.7 percent in 1945 to 2.9 percent in 1964.

Farm cash income from the sale of farm produce has almost doubled in the post war period in Kansas, rising from \$791 million in 1945 to \$1,319 million in 1965. As shown in Table 6, despite the relatively large increase in crop production in Kansas over the post war period, cash receipts from the sale of livestock and livestock products has increased much more quickly than cash receipts from the sale of crops. In 1945, cash receipts from the sale of crops totalled \$345 million, 43.3 percent of total farm cash receipts of \$791 million. Cash receipts from the sale of livestock and livestock products made up the remaining 56.7 percent. By 1964, cash receipts from the sale of crops had risen 30.4 percent to \$450 million, but this made up only 37.4 percent of total farm cash receipts. Kansas farmers have apparently fed an increasingly larger proportion of grain and hay produced on their own farms or purchased from other Kansas farmers to livestock.



TABLE 6. — Cash receipts from the sale of livestock and crops, Kansas and the United States, 1945-1965<sup>a</sup>

Year	Kansas			United States		
	Crops	Livestock	Total	Crops	Livestock	Total
millions of dollars						
1945	345.0	446.3	791.3	9,419	11,967	21,383
1946	405.8	489.3	895.1	10,834	13,730	24,564
1947	615.3	599.3	1,214.6	13,230	16,476	29,706
1948	584.4	459.0	1,013.4	13,136	17,071	30,207
1949	440.6	539.9	980.5	15,359	12,585	27,994
1950	381.4	495.3	876.7	12,352	15,976	28,328
1951	395.3	699.1	1,094.4	13,187	19,612	32,799
1952	546.6	634.3	1,180.9	14,248	18,445	32,693
1953	467.8	494.3	962.1	14,078	16,923	31,001
1954	477.1	483.8	960.9	16,276	15,556	31,832
1955	461.5	571.8	1,033.3	14,038	16,363	30,401
1956	373.7	474.6	848.3	13,523	15,967	29,490
1957	261.4	414.7	676.1	17,376	16,338	33,714
1958	609.3	557.7	1,167.0	14,229	19,227	33,511
1959	581.1	624.6	1,205.7	14,648	18,863	33,476
1960	611.9	605.1	1,217.0	15,090	18,909	33,999
1961	639.6	698.0	1,337.6	15,532	19,361	34,893
1962	630.2	755.7	1,385.9	16,162	20,025	36,187
1963	568.8	796.9	1,365.7	17,327	19,926	37,253
1964	450.4	743.7	1,194.1	17,135	19,764	36,899
1965	469.7	849.1	1,194.9			

<sup>a</sup> Source: United States Department of Agriculture, "Agricultural Statistics," (Superintendent of Documents, United States Government Printing Office, Washington, D.C., 1945-1966)

## CHAPTER II

### OBJECTIVES OF THE STUDY

The objectives of this study are to determine the historical growth pattern of the livestock and meat packing industries in Kansas relative to other West North Central states and the United States in total; to determine procurement and distribution policies and practises of various sizes of meat packing plants; to determine the extent to which the meat packing industry contributes to the economy of Kansas, and to analyze some of the factors influencing the possibilities of plant expansion in Kansas.

A significant feature of the expansion of livestock production in Kansas has been the trend towards a wider distribution of production throughout the state. This has been especially evident in the traditional wheat growing areas of western Kansas. Factors associated with this change appear to be the expansion in irrigated acreage, development of commercial cattle feeding on an increasingly larger scale, and federal farm programs. Along with changes in livestock production patterns in Kansas and other mid-western states has been a change in the population density pattern for the United States, with a pronounced shift in population towards southwestern and western areas. This has tended to open up areas of expanded demand for livestock products, and Kansas is strategically located for supplying this market. The present freight rate structure and the trend to lower prices for animal by-products appear to favor the shipment of dressed meat over the shipment of live animals, and these point to possible expansion of the meat packing industry in or near areas of production.

The expansion of agri-industry in the more rural areas would be a significant factor in alleviating some elements of the total agricultural adjustment problem. With the trend towards larger and fewer farms has come a substantial off farm migration of farm workers to the cities, with deleterious effects on the social and economic structures of the rural communities involved. The meat packing industry is a highly labor intensive industry. Complementary facilities such as transportation, marketing, and distribution would tend to enhance employment opportunities at the local level. There would also be a stimulus to greater production of livestock within the state, which in turn would stimulate those industries involved in raw material supply for farm operations.

On the supply side, feeder stock and feed are combined in the livestock feeding process to furnish fed livestock, the principle input to the meat packing industry. The supply of feeder livestock depends upon the availability of suitable range land in Kansas, and the areas from which Kansas 'imports' feeder stock, and the production of forages and feed grain. The supply of feed grains depends upon present and potential grain production, and government policy towards agricultural production and prices. Changes in technology in the production of feeder stock in Kansas and in the technology of meat processing are potentially important for Kansas.

On the demand side, the market for meat product and packing house by-products depends upon population growth, purchasing power, transportation costs to present and potential out of state markets, and the possibility of stimulating local by-product using industries. In a study such as this, conditions which could effectively place a limit on the growth of the livestock and meat packing industries of Kansas are of particular interest.

## CHAPTER III

### SCOPE AND PROCEDURE

#### Source of data

Data thought to be useful in achieving the objectives of this study were obtained from five primary sources. Information on changes in the structure of the Kansas meat packing industry relative to other West North Central states and the United States as a whole, and preliminary estimates of livestock number on farm by county within Kansas were obtained from publications of the United States Department of Commerce and the United States Department of Agriculture.

Information on livestock marketings, meat production, cattle on feed, farm cash income, liveweight production of livestock, and livestock-feed relationships were obtained from various reports published in relevant years by the United States Department of Agriculture Market Reporting Service.

Data on livestock marketing and population by crop and livestock reporting district, livestock-feed relationships for Kansas as a whole, the rank of Kansas as a livestock and meat packing state, and crop production by crop and livestock reporting district were obtained from annual reports of the Kansas State Board of Agriculture.

Previous research done by members of the Department of Economics, Kansas State University, provided information on structural changes in the Kansas livestock industry, and provided estimates of the potential demand for meat

and the competitive position of Kansas relative to supplying these demands in the future.

A sample survey of meat packing plants in Kansas was conducted in order to provide reasonably up-to-date information on the characteristics of meat packing plants in Kansas.

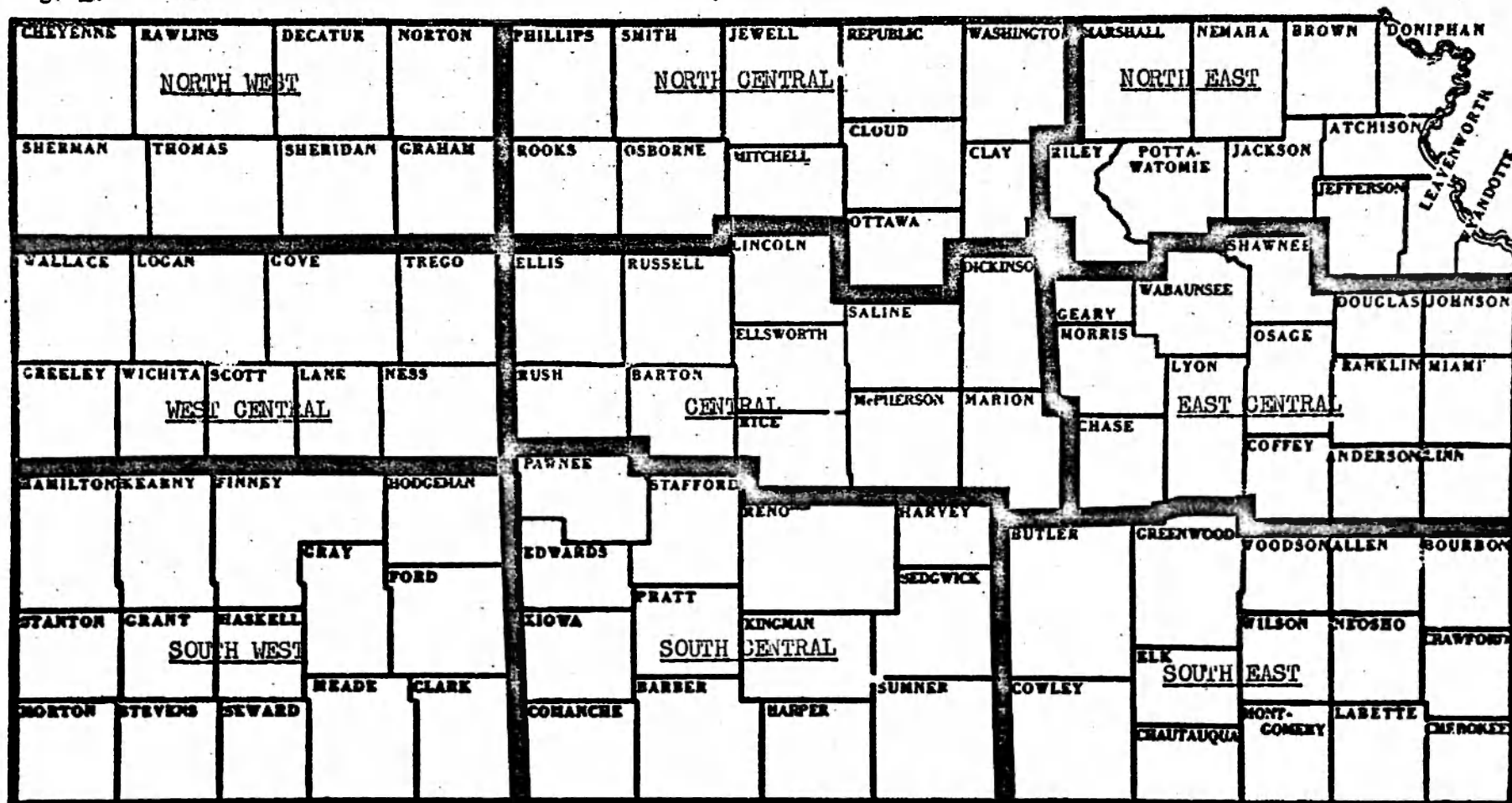
#### Selection of Sub-Areas

While this study does not attempt to relate location of meat packing plants in regard to sub-areas of the states, sub-areas are used to some extent in locating and establishing trends in livestock and feed production in Kansas. Determination of the sub-areas to be used in the above context was influenced by the availability and condition of the data. It was felt that some disaggregation would be necessary to achieve the purposes of this study, but that dealing with county data would be too cumbersome, and not particularly meaningful. As much of the data available is in terms of crop and livestock reporting districts, as outlined by the United States Department of Agriculture, it was considered to be expedient to use these areas insofar as possible. Hereafter, they will be termed crop districts. (Fig. 1) Information obtained in county form was aggregated to crop district totals wherever possible and practical.

#### Selection of Period

Much of the data used were available over a long period of time, but it was decided to limit the scope of this study to the post war period, that is, 1945 to 1964. Changes occurring in this period can be considered to be more relevant to changes that may take place in the future, as the nearer the base period, the more accurate is the assumption that past trends will

Fig. 1. OUTLINE OF THE SUBAREAS USED IN THIS STUDY.



continue into the future in much the same fashion that they have occurred in the past. As data were generally obtainable for 1964 and not for later years, 1964 was generally used when portions of the study were cast in terms of a single year.

#### Method of Sampling and Selection of Size Categories

As this study was intended to be primarily descriptive, the sample survey of meat packing plants forms a relatively small part of the total body of the study. However, for completeness, the method of sampling and selection of size categories is included, and is as follows.

According to the Census of Manufactures, there were 83 meat packing plants in Kansas in 1963.<sup>9</sup> According to the Census definition, small plants, those employing less than 5 workers, are not considered to be packing plants. Only those plants employing 5 or more workers are included, and are broken down into two groups, those employing from 5 to 19 workers, and those employing more than 19 workers. This study uses the same categories, but in order to avoid leaving the impression that meat packing plants only employ 5 or more workers, those employing from 5 to 19 workers will be termed medium sized plants, and those employing 20 or more will be termed large plants.

Consideration of recent trends in the meat packing industry of the United States led to the conclusion that the potential for the growth in size of plant and volume of production lay mainly with medium and large sized plants not including those of the national packers. Accordingly, 8 large plants out of the 25 operating in Kansas in 1963 were included in the sample, as were 9 of the 58 medium sized plants.

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<sup>9</sup> United States Department of Commerce, Bureau of the Census, "United States Census of Manufactures, Meat Products, Industry Report M 58(2) -20A, (Superintendent of Documents, United States Government Printing Office, Washington, D.C., 1963) p. IV.

It must be noted that this sample has not been randomly selected, and is thus not suitable for statistical analysis. It should be useful, however, in denoting some of the characteristics of meat packing plants in Kansas, and should be representative of the plants within which future expansion, if any, will take place.

#### Procedure

The survey used the personal survey method of observation. An outline of the questions asked is included in Appendix 1. In light of the limited scope of this survey, data were aggregated.



## CHAPTER IV

### THE KANSAS MEAT PACKING INDUSTRY

#### Introduction

As was discussed previously, the meat packing industry of Kansas holds a relatively major place in manufacturing production in Kansas. Despite rapid increases in the production of livestock relative to neighboring states, growth of the Kansas meat packing industry does not appear to have kept pace when the post World War Two period is considered. Trends in development of the Kansas meat packing industry have also not been consistent with those in the national meat packing industry over the 1945 to 1964 period.

In order to analyse some of the factors influencing the possibility of expansion of the meat packing industry in Kansas, some understanding of the present state of the industry would appear to be necessary. Hence, this chapter will be primarily devoted to a description of operating characteristics of some Kansas meat packing firms, and a discussion of recent and relative trends in the Kansas meat packing industry.

#### Some Characteristics of Meat Packing in Kansas

The sample of Kansas meat packing plants included in this study had a total of 679 employees, representing about 10 percent of all workers in meat packing plants in Kansas. (Table 7) The large plants included in this sample had 89 percent of the total number of employees. While the medium sized plants had a larger proportion of administrative workers in relation to total

number of workers than did the larger plants, the proportion of workers classed as salesmen and buyers varied little with the size of plant. It is possible that these workers also had other duties in the medium sized plants, however.

TABLE 7. -- Numbers of employees and proportion by class of work, selected meat packing plants, Kansas, 1964<sup>a</sup>

Plant size	Number reporting	Administration		Production		Salesmen		Buyers		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
Large	9	50	8.2	501	82.7	37	6.1	18	3.0	606	100.0
Medium	8	11	15.1	55	75.4	4	5.5	3	4.0	73	100.0

<sup>a</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

The 17 plants included in this survey had an approximate total slaughter in 1964 of 178,360 head of cattle, 12.6 percent of cattle slaughtered in Kansas that year. (Table 8) The bulk of these, however, were slaughtered

TABLE 8. -- Estimated yearly livestock slaughter, total by type for selected meat packing plants and for Kansas, 1964<sup>a</sup>

Plant size	Cattle		Calves		Hogs		Sheep and lambs	
	Plants reporting	Head	Plants reporting	Head	Plants reporting	Head	Plants reporting	Head
Large	9	178,360	2	416	8	188,812	0	0
Medium	8	17,940	2	1,312	7	12,376	1	1,040
Total	17	196,300	4	1,768	15	201,188	1	1,040
Kansas		1,419,000		55,300		2,584,000		55,300

<sup>a</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

in the large plants. Little can be said about the volume of slaughter of sheep and lambs or calves as the plants included in the survey slaughtered a relatively small proportion compared with state totals. In regard to hogs, however, 15 plants, of which 8 were large and 7 were medium sized, slaughtered an estimated 201,188 head, some 8 percent of the total number of hogs slaughtered in the state in 1964. Of this total, 94.3 percent were slaughtered in the large plants.

The slightly higher proportion of cattle slaughtered in these plants and the relative distribution of slaughter between the large and the medium sized plants would indicate that hog slaughter tends to be concentrated in the larger plants, and is consistent with observed trends in the United States in the post war period.

Packing plant owners and operators were asked for their estimates of the potential capacity of their plants, capacity being defined as the total physical volume that the plants could slaughter. As the plants included in the sample slaughtered primarily cattle and hogs, only their estimates for these appear relevant. (Table 9)

TABLE 9. — Proportion of plant capacity utilized, selected meat packing plants, Kansas, June, 1964<sup>a</sup>

Plant size	Number reporting	Percentage range of capacity							
		0 - 19		20 - 39		40 - 59		60 - 100	
		Cattle	Hogs	Cattle	Hogs	Cattle	Hogs	Cattle	Hogs
Large	9	0	0	1	2	2	2	6	4
Medium	8	0	0	0	1	1	0	5	6

<sup>a</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

Of the 9 large packing plants surveyed, only 6 operated relatively close to full capacity (over 60 percent) in cattle slaughter, while only 4 of 8 of the large plants were at or near full capacity in the slaughter of hogs. Of the medium sized plants, 7 of 8 included in the sample were close to full capacity in the slaughter of cattle, while 6 of 8 were at this level in the slaughter of hogs.

The relatively light slaughter levels at some of these plants is in some degree explained by the seasonality of slaughter in Kansas. In 1964, cattle slaughter in July was 6 percent higher in total than in June, the time that the survey was made. Hog slaughter in the month of April, 1964, was 26 percent higher than in June.<sup>10</sup> At peak periods, therefore, slaughtering facilities in Kansas appear to be fairly well utilized.

An estimate of total available cooler space was made by plant owners and operators. (Table 10) Medium sized plants, in relation to slaughter

TABLE 10. — Cooler capacity and weekly slaughter volume, selected meat packing plants, Kansas, 1964<sup>a</sup>

Plant size	Beef carcasses			Hog carcasses		
	Plants reporting	Cooler capacity	Weekly slaughter	Plants reporting	Cooler capacity	Weekly slaughter
Large	9	1,975	3,430	8	2,215	3,631
Medium	8	410	344	7	195	238

<sup>a</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

capacity, had greater cooler space than did the large plants for both cattle and hogs. This perhaps indicates that availability of cooler space

is a limiting factor in the operation of large plants. It also indicates that operators of the larger plants move their product to market more quickly.

Limited information was obtained concerning plant costs. Some information was obtained regarding the use of public utilities and taxes on property, and a few plants also reported an estimate of costs of supplies, not including livestock.<sup>11</sup> Average costs per size of plant are included in Table 11.

TABLE 11. -- Average cost of utilities, supplies and property taxes, selected meat packing plants, Kansas, 1964<sup>a</sup>

Plant size	Electricity	Water	Gas	Sewage	Supplies	Taxes on Property
	dollars					
Large	13,275	4,212	6,965	1,308	61,614	5,524
Medium	2,605	449	1,170	250	5,640	824

<sup>a</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

Costs of utilities in large plants compared with those in medium sized plants show approximately the same relation to one another. Meat packing plants are relatively large users of electricity, water, and gas. Most large and medium sized plants used municipal sewage facilities. Of some importance is the much larger proportion of costs of supplies indicated by the larger plants, which is perhaps due to the higher level of processing carried out by these plants in their operations. Taxes on property appear to be a relatively small proportion of total costs.

<sup>11</sup> A more complete breakdown of costs from a similar study in South Dakota is included in Appendix II.

A meat packing plant may acquire supplies of livestock by using one of several different procedures. Large plants normally have their own buyers who specialize in purchasing livestock, and the larger the plant, the greater is the degree of specialization. Smaller plants in Kansas are not usually this complex, and often the manager buys all types of livestock on a part time basis.

Order buyers at auctions or terminal markets are also utilized by meat packers, usually the medium sized or smaller plants or those located some distance from the market. The order buyer may obtain the livestock at the terminal or auction market, or may buy directly from producers. He will then arrange for the shipment of the livestock to the packing plant. He normally charges a commission for his services.

There are still some country dealers active in the buying and selling of livestock in Kansas, usually in combination of a livestock enterprise of their own. Dealers usually buy direct from the producers in their area, and also attend auction sales regularly. Livestock purchased in this manner may be sold directly to meat packers, or may be kept for feeding in their own operations. Producers may also be solicited directly by operators of packing plants or their representative, but may also sell directly to the plants without solicitation on the part of the meat packer.

Large plants included in the sample tended to purchase livestock from a larger area than did the medium sized plants, although the contrast is much greater in regard to cattle procurement than for hog procurement. The sample of large plants included in this study purchased 23.1 percent of the cattle slaughtered in their plants from within 25 miles, compared with 51.6 percent for the medium sized plants. (Table 12) Large plants obtained 17.2 percent of cattle slaughtered from distances of over 200 miles,

whereas medium sized plants obtained over 99 percent of their cattle from within 100 miles.

TABLE. 12. -- Proportion of livestock purchases by distance from plant, selected meat packing plants, Kansas, 1964<sup>a</sup>

Plant size	Plants reporting	Percent obtained within indicated distances						Total
		Under 25 miles	25-49 miles	50-99 miles	100-149 miles	150-199 miles	200 or more mi.	
Cattle								
Large	9	23.1	38.3	17.8	2.7	0.9	17.2	100.0
Medium	8	51.6	28.7	18.8	0.8	0.0	0.0	100.0
Hogs								
Large	7	46.5	32.4	18.1	3.0	0.0	0.0	100.0
Medium	7	59.0	40.0	0.5	0.5	0.0	0.0	100.0

<sup>a</sup> Source: Survey of meat packing plants, Department of Economics, Kansas State University, June, 1964.

In hog procurement, the difference was not so great. Large plants obtained 78.9 percent of their hog supplies from within 50 miles, while medium sized plants obtained 99 percent of their supplies from within the 50 mile radius. Even though large plants tended to draw hogs from a larger distance than did the medium sized ones, relatively few were obtained from distances of over 100 miles in any case.

The distance that meat packers draw their livestock supplies from appear to indicate that they are located near the center of supply in Kansas, or are alternatively limited to livestock within local supply.

The meat packers included in this sample survey reported that auction markets were the most important source for livestock purchases. (Table 13)

TABLE 13. -- Source of slaughter livestock, proportion by market by type, selected meat packing plants, Kansas, 1964<sup>a</sup>

Plant size	Plants reporting	Terminal markets	Auction markets	Direct from producer		Total
				Not solicited	Solicited	
Cattle						
percent						
Large	8	22.7	45.3	15.0	17.0	100.0
Medium	7	4.7	65.6	29.7	0.0	100.0
Hogs						
percent						
Large	7	12.4	42.2	45.4	0.0	100.0
Medium	7	0.0	71.4	28.6	0.0	100.0

<sup>a</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

Purchases of cattle from this type of market made up 45.3 percent of large plant supplies, and 65.6 percent of medium sized plants purchases. Roughly the same relationship is also observed with regard to hog purchases, large plants buying 42.2 percent of their supply from auction markets, and medium sized plants buying 71.4 percent from this source.

The next most important market was that of direct sales by farmers to plants. This was in large part unsolicited by the meat packers, although large plants obtained 17 percent of their cattle purchases through solicitation. Purchases without solicitation directly from farmers made up 15 percent of



the cattle supply of the large plants, and 29.7 percent of the cattle supply of the medium sized plants. None of the medium sized plants obtained cattle through solicitation. Hogs purchases in this manner made up a relatively larger proportion of the supply of larger plants, 45.4 percent, but made up only 28.6 percent of the supply for the medium sized plants.

Terminal markets, while supplying a substantial proportion of the cattle for slaughter in the large plants, were a relatively unimportant source for medium sized plants, which depended to a much larger extent upon local supply. The same relationship holds true for hog purchases, which represented only 12.4 percent of large plants supply, but none of the supply of the medium sized plants.

The large plants included in this survey purchased a relatively larger proportion of cows than did the medium sized plants. (Table 14) Steers and

TABLE 14. -- Cattle purchases, percentage of slaughter by type, selected meat packing plants, Kansas, 1964

Plant size	Plants reporting	Percent by type or class				Total
		Cows	Steers and heifers	Bulls	Calves	
Large	9	38.5	56.0	4.7	0.8	100.0
Medium	8	8.7	81.7	9.0	0.6	100.0

<sup>8</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964

heifers, on the other hand, made up a relatively larger proportion of slaughter than in medium sized plants. Medium sized plants also slaughtered a larger proportion of bulls than did the larger plants.

In the case of steers and heifers, a relative quality bias is evident

on the part of the large plants. Choice and better grades made up 42.6 percent of total heifer and steer slaughter at large plants, compared with 28 percent at medium sized plants. (Table 15) Medium sized plants tended

TABLE 15. — Purchases of slaughter steers and heifers, proportion by grade, selected meat packing plants, Kansas, 1964

Plant size	Plants reporting	Grade				Total
		Prime	Choice	Good	Standard	
Large	9	0.4	42.2	54.0	3.4	100.0
Medium	8	0.0	28.0	72.0	0.0	100.0

<sup>e</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

to slaughter a relatively larger proportion of good grade animals, 72.0 percent, compared with 54 percent for the large plants. Relatively little steer and heifer slaughter was of the lower grades in either large or medium sized plants.

Slaughtering volume normally represents a major portion of the work handled in packing plants. Many plants, however, even small ones, do some processing. Of the sample plants included in this survey, 8 of the 9 large plants operated sausage departments whereas only 2 of the 8 medium sized plants had this type of processing operation. Of the 6 plants giving a breakdown of the profitability of various enterprises, 3 indicated that the sausage department was their most profitable enterprise, and 2 others ranked it second after beef slaughter. Slaughter of hogs generally ranked third.

Packing plant operators in this survey were asked to break down the proportion of their sales by form i.e. type of out. As indicated in Table 16, a relatively large proportion of beef is sold in carcass form. This category

made up 50.1 percent of the sales of large plants, and 40.4 percent of the sales of direct medium sized plants. Primal cuts made up the next largest

TABLE 16. — Form of sales of meat, proportion by type, selected meat packing plants, Kansas, 1964<sup>a</sup>

Plant size	Plants reporting	Form of meat sales			Total
		Carcass	Primal or wholesale cuts	Retail cuts	
Beef					
percent					
Large	9	50.1	34.5	15.4	100.0
Medium	8	40.4	29.7	29.9	100.0
Pork					
percent					
Large	8	1.5	81.2	17.3	100.0
Medium	7	4.6	74.8	20.6	100.0

<sup>a</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

of form of distribution of beef in the case of the large plants, with 34.5 percent of total volume being distributed in this fashion. Only a relatively small amount of beef, 15.4 percent, was distributed by the large plants as or in the form of retail cuts. In contrast, the medium sized plants sold more of their volume of beef in the form of retail cuts, 29.9 percent, and relatively more in the form of primal or wholesale cuts, 29.7 percent, than did the large plants. Relatively little pork was sold in carcass form

by either large or medium sized plants, most being distributed in the form of primal cuts. This made up 81.2 percent of large plant sales volume, and 74.8 percent of medium sized plant sales volume. A relatively large proportion of pork was sold in the form of retail cuts by both large and medium sized plants, making up 17.3 percent of sales for the large plants, and 20.6 percent of the sales of the medium sized plants.

Although the meat packing plants included in this sample survey sold meat through several outlets, the most important was the retail grocer. As might be expected, this outlet was of somewhat greater importance to large plants as compared with medium sized ones, as is indicated in Table 17.

TABLE 17. — Proportion of meat sold through various outlets, selected meat packing plants, Kansas, 1964<sup>a</sup>

Plant size	Plants reporting	Outlet					Total
		Retail Grocers	Restaurants	Whole-salers	Jobbers	Others	
Beef							
percent							
Large	9	77.1	4.7	2.8	14.6	0.8	100.0
Medium	8	46.8	18.3	3.5	0.0	31.4	100.0
Pork							
percent							
Large	8	93.1	3.6	2.4	0.4	0.5	100.0
Medium	7	55.6	19.7	0.4	0.0	24.3	100.0

<sup>a</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

Large plants sold 77.1 percent of their beef and 93.1 percent of their pork to the retail grocers, while medium sized plants sold 46.8 percent of their beef production and 55.6 percent of their pork to this outlet. This is a slightly larger proportion than for meat packers in the United States.<sup>13</sup>

For the most part, meat packers included in this survey were oriented towards local sales. (Table 18) This was particularly true of the medium

TABLE 18. — Distance of sales of meat from selected packing plants, Kansas, 1964<sup>a</sup>

Plant size	Radius of sales						Total
	Under 25 mi.	25-49 miles	50-99 miles	100-149 miles	150-200 miles	Over 200 miles	
	number of plants						
Large	0	0	5	2	1	1	9
Medium	3	2	3	0	0	0	8

<sup>a</sup> Source: Survey of Meat Packing Plants, Department of Economics, Kansas State University, June, 1964.

sized plants. The situation is slightly different for the large plants.

As plants grow larger, they tend to integrate in such a fashion as to process the by-products of slaughter to a larger degree.<sup>14</sup> Only a few of the plants included in this sample survey had progressed very far in this manner. To a large extent, the only byproduct processed and distributed was lard, and almost as many of the medium sized plants processed and sold lard as did the larger ones. Of the 8 large plants reporting slaughter of hogs, 6 rendered lard, but so did 5 of the 7 medium sized ones.

<sup>13</sup> National Commission on Food Marketing, "Organization and Competition in the Livestock and Meat Industry," (U.S. Government Printing Office, June, 1966)

<sup>14</sup> American Meat Institute, By-Products of the Meat Industry. (Institute of Meat Packing, University of Chicago, Illinois, 1950) p. 2.

Hides were sold, salted or raw, to jobbers in the hide trade, this being true of the large plants as well as of the medium sized ones. Tallow and inedible grease were sold to rendering companies or to soap manufacturers. Tankage was disposed of to jobbers, and in one instance was cooked and fed to livestock as a protein supplement.

#### Recent Trends in the Kansas Meat Packing Industry

Post war changes in the number of meat packing plants in Kansas have shown a mixed trend, falling from 59 firms in 1947 to 51 firms in 1954. A large number of meat packing plants had been set up in Kansas during World War Two, and the drop in plant numbers that occurred in the early post war period may in large part have resulted from an adjustment to the peace time market. Factors making for the location of meat packing plants close to areas of livestock production had not gained sufficient force, and wide swings in production as producers adjusted to the peace time market may have tended to discourage operation of meat packing plants in Kansas during this period. The rise of the retail food chains with greater emphasis on federal grading may also have been a factor.<sup>15</sup>

By 1958, however, numbers of meat packing plants had risen to 66, and in 1963, a total of 83 firms were reported. (Table 19) In contrast with Kansas, plant numbers in the balance of the West North Central states paralleled the national trend, rising over the entire period.

Much of the growth of number of plants in Kansas over the post war period has been in small plants. In the period from 1954 to 1963, plants employing over 20 people rose only moderately, from 22 to 25 in number. While this

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<sup>15</sup> Williams, op. cit., p. 329.

TABLE 19. — Number of meat packing establishments, by numbers or workers employed, 1947-63, selected areas<sup>a</sup>

Area	1947		1954		1958		1963	
	Total	With over 20 workers	Total	With over 20 workers	Total	With over 20 workers	Total	With over 20 workers
	numbers							
United States	2,153	n.a. <sup>b</sup>	2,367	933	2,801	977	2,992	976
West North Central	238	n.a.	268	127	324	133	403	145
Minnesota	25	n.a.	29	14	33	14	48	14
Iowa	38	n.a.	43	28	60	29	72	36
Missouri	63	n.a.	67	26	72	28	89	27
Nebraska	32	n.a.	49	24	64	25	79	31
Kansas	59	n.a.	51	22	66	23	83	25

<sup>a</sup> Source: United States Department of Commerce. Bureau of the Census, "United States Census of Manufactures, Meat Products, Industry Report MC 58(2) -20A, (Superintendent of Documents, United States Government Printing Office, Washington, D.C.) p.5.

<sup>b</sup> Not available.

is somewhat in contrast to Minnesota and Missouri, which have shown little or no change, on the other hand Nebraska added 7 and Iowa added 8 large plants over the same period. In terms of both small and medium plants and large plants, growth of the Kansas meat packing industry in terms of numbers of plants since 1954 has been substantially higher than the national average. Total numbers rose 63 percent in Kansas from 1954 to 1963, compared with 22 percent nationally. Numbers of large plants in Kansas increased 14 percent over this period, compared with 4 percent in the national picture.

In 1963, 8,070 people were employed in the meat packing industry in Kansas, compared with 13,241 in 1947. (Table 20) Salaries paid, however, rose from \$37.5 million to \$54.2 million over the same period. While the increase in salaries per worker roughly parallels that in other West North Central states and the nation as a whole, the 40 percent reduction in numbers employed in Kansas over this period accounts for almost all of the reduction in the West North Central area, and is triple the rate for the nation. By way of contrast, employment in Iowa meat packing firms increased by 4 percent over this period, while employment in Nebraska rose 7.5 percent. Employment in the meat packing industry in Missouri has also fallen, but by only 17 percent, or just slightly more than the national average.

Much of the reduction in numbers of workers employed in the Kansas meat packing industry occurred previous to 1954, however, and may well have resulted from adjustments to post war conditions. Extensive labor saving technological innovation may also have been a factor.<sup>16</sup> Since that time, the rate of reduction in workers employed in the meat packing industry in Kansas has roughly paralleled the national trend. Between 1954 and 1963, numbers

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<sup>16</sup> Ibid.



TABLE 20. — Employee classification at meat packing establishments, selected areas, 1947-63<sup>a</sup>

Area	1947		1954		1958		1963	
	All employees	Production workers	All employees	Production workers	All employees	Production workers	All employees	Production workers
	numbers							
United States	208,369	167,072	220,194	167,815	200,783	150,785	180,873	138,356
West North Central	72,927	59,278	75,481	58,644	71,274	54,859	67,929	52,818
Minnesota	13,646	11,197	15,416	11,808	14,317	10,795	13,496	10,309
Iowa	22,665	18,458	25,533	20,064	24,736	19,058	23,630	18,496
Missouri	9,281	7,458	9,191	7,065	8,230	6,237	7,652	5,807
Nebraska	9,466	7,842	11,126	8,911	10,770	8,627	10,265	8,180
Kansas	13,241	10,661	9,484	7,192	8,122	6,098	8,070	6,191

<sup>a</sup> Source: United States Department of Commerce. Bureau of the Census, "United States Census of Manufactures, Meat Products, Industry Report MC 58(2) -20A, (Superintendent of Documents, United States Government Printing Office, Washington, D.C.) p. 5.

employed in the meat packing industries of all the West North Central states have shown some reduction.

As in Kansas, the reduction in numbers employed over this period in the United States took place almost entirely from the ranks of the production worker. In 1947 in the United States, there were 208,368 people employed in the meat packing industry. Of these, 167,072 were production workers and 41,325 were engaged in other facets of the business. In 1963 there were 180,873 people employed in the meat packing industry, of which 138,356 were production workers and 42,517 were not. Workers in the non-production category had actually increased over the post war period. These trends are true of almost every state. In Kansas in 1947, for example, total employment in the meat packing industry was 13,241, of which 10,661 were production workers, and 2,580 were not. In 1963, only 8,070 workers in total were employed, of which 6191 were production workers. It is apparent that while gains in productivity in the production side of the industry have been extensive, this is not true for the balance.

Value added reflects the amount of value added to total output after the cost of the primary raw material is considered. It reflects the cost of wages and salaries, amortization, transportation, taxes, profits, and other costs of doing business and is thus an indicator of the contribution of the meat packing industry to the economic activity of the state. In Kansas in 1947, value added totalled \$49,170,000. (Table 21) By 1963 this had risen 51.5 percent to \$74,494,000. While this rise was substantial, it was somewhat less than occurred for the United States as a whole, which rose 95.3 percent. Of the West North Central states, Kansas increased its value added the least, in proportion, over the post war period. Two other states, Missouri and Nebraska, were below the national average, with increases of

TABLE 21. — Value added by manufacture and new capital investment in meat packing plants, selected areas, 1947-63<sup>a</sup>

Area	1947		1954		1958		1963	
	Value added	New investment	Value added	New investment	Value added	New investment	Value added	New investment
thousands of dollars								
United States	976,995	67,567	1,394,386	64,976	1,746,603	63,129	1,908,309	80,235
West North Central	335,402	21,102	487,116	15,957	643,747	17,232	718,254	23,911
Minnesota	69,144	3,189	122,233	4,065	142,251	3,995	142,800	4,904
Iowa	92,609	6,436	153,885	5,176	216,782	5,693	266,419	8,095
Missouri	39,908	6,551	49,067	1,812	65,708	1,289	71,578	1,835
Kansas	49,170	2,089	55,396	2,435	62,435	2,630	74,494	1,980
Nebraska	60,589	1,796	67,090	1,697	100,795	2,365	99,917	4,767

<sup>a</sup> Source: United States Department of Commerce, Bureau of the Census, "United States Census of Manufactures, Meat Products, Industry Report MC (58-2) -20A, (Superintendent of Documents, United States Government Printing Office, Washington, D.C.) p. 5.

79 percent and 65 percent respectively. These increases were, however, proportionately much greater than that which occurred in Kansas.

As indicated previously, numbers of meat packing plants dropped sharply in Kansas in the early post war period, coincident with the return to peace time conditions. This, coupled with the relative shift from pork to beef slaughter that occurred may account for at least part of the worsening of Kansas's relative position.

Expenditure on new capital equipment in Kansas, while rising slowly in the 1947-1958 period, tended to fall off in 1963. Expenditure on new capital equipment in most other West North Central states, with the exception of Missouri, have risen over the entire period except for 1958, paralleling the national trend. In 1947, new capital expenditure in Kansas totalled \$2,089,000. It rose to a peak of \$2,660,000 in 1958, but dropped to \$1,985,000 in 1963. In contrast, the meat packing industry of Iowa invested \$6,436,000 in 1947, \$5,693,000 in 1958, and \$8,095,000 in 1963. (Table 21)

### Conclusions

It would appear that the recent trends in the meat packing industry in Kansas can be divided into essentially two stages. The first period might be considered to be the period of immediate adjustment after the Second World War, extending from 1947 to 1954. In this period, numbers of plants dropped sharply in Kansas, apparently as a result of a discontinuation of wartime business advantages, production swings resulting from producer adjustment to the same peace time market, and the rise of the retail food chains with greater emphasis on federal grading. Even yet, medium sized meat packing plants do not deal to any large extent with the large food chains. Workers employed in the production sectors declined sharply, perhaps as a result of extensive

labor saving technological innovation. The fairly high capital investment that occurred during this period also tends to support this conclusion. A relative decline in livestock production from high war time levels also occurred.

The second period might be considered to be one of slowly accelerating growth, extending from 1954 to 1963, and perhaps even to the present. Numbers of plants have increased substantially, perhaps as a result of increased tendencies to decentralization, and a rapid increase in livestock production. A reduced rate of production worker decline also occurred, not so much as a result of a reduced rate of technological innovation, but also as a result of increased demand for labor to handle greater production volumes. Value added to manufacture also increased over this period, but was limited to some extent by the increasingly strong tendency to slaughter cattle compared with hogs and sheep and lambs. The characteristics of this type of meat packing do not allow a great deal of processing and therefore high value added/primary cost ratios.

Over the 1954-1963 period, the Kansas meat packing industry has increased in importance relative to the meat packing industries in the rest of the West North Central States. Consideration of a selected sample of meat packing plants in Kansas does not disclose any major restriction on expansion. The Kansas meat packing industry would appear to be operating at moderately full capacity, hence expansion may require new facilities. Meat packing in Kansas is in a state of transition, with considerable further change expected. It would appear, however, that the trend to increasing decentralization of the meat packing industry may go on for some time, with the result that expansion in the Kansas meat packing industry may well become more rapid as time goes on.

## CHAPTER V

### THE KANSAS LIVESTOCK INDUSTRY

#### Introduction

The major input into the meat packing industry, and hence the main consideration in assessing the possibility of expansion in the meat packing industry in Kansas is the present supply of livestock and the potential supply of livestock in the future. In this context, structural changes in the livestock industry in Kansas, as they can have a major affect on future production patterns, warrant consideration. It seems reasonable to assume that factors affecting livestock production in Kansas in the immediate past should also tend to exert some influence on future developments. Accordingly, this chapter will also be concerned with tracing recent trends in livestock production in Kansas.

In light of the previously mentioned trend to location of packing plants closer to areas of livestock production, structural changes and recent trends in the Kansas livestock industry will be considered on a crop district basis insofar as is possible, in order to indicate in a general way the areas in which new packing plants may tend to locate.

#### Structural Changes in the Kansas Livestock Industry

There has been a marked trend towards increased size of farms and a decline in the number of farms in Kansas over the post war period. As indicated in Table 22, size of farms has increased from an average of 344

TABLE 22. -- Numbers and average size of farms in Kansas, selected years, 1945-1964<sup>a</sup>

Year	Average size of farms  acres	Number of farms
1945	344	141,192
1950	370	131,394
1955	416	120,167
1960	481	104,347
1964 <sup>b</sup>	540	92,479

<sup>a</sup> Source: United States Department of Agriculture, Bureau of the Census, "Kansas Counties, Volume 1," State Table 1, p. 3.

<sup>b</sup> Preliminary

acres in 1945 to an average of 540 acres in 1964. In contrast, numbers of farms have dropped from 141,192 in 1945 to 92,479 in 1964.

Concomittant with the growth in the size of Kansas farms has been a growth in the size of Kansas livestock feeding units. Using sample data drawn from county assessors records, Olson<sup>17</sup> computed some important elements of structural change within the Kansas livestock industry, for Kansas total, and for crop reporting districts.

As indicated in Table 23, the number of farms producing grainfed cattle does not show the steady declining trend as is the general case for all farms in Kansas. The number of farms producing grainfed cattle in 1960 actually totalled more than in 1940, rising from 15,830 farms to 16,500 farms over this period. The number of farms in this category dropped slightly from 1960 to 1963, however. On the other hand, the number of grainfed cattle marketed

<sup>17</sup> Olson, Ross A., "A Study of Structural Changes in the Livestock Economy of Kansas, (Unpublished M.S. Thesis, Department of Economics, Kansas State University, 1967)

TABLE 23. — Number and percent of producing units and grainfed cattle marketed by size of operation, for years 1940, 1950, 1960, and 1963, Kansas<sup>a</sup>

Size category	1940		1950		1960		1963		
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
<b>Grainfed Cattle</b>									
1 - 25	88,452	23.40	98,784	23.52	114,853	13.56	95,734	9.04	
26 - 50	60,707	16.06	79,044	18.82	130,862	15.45	119,561	11.28	
51 - 100	65,772	17.40	82,068	19.54	164,742	19.45	147,942	13.96	
101 - 200	61,349	16.23	73,710	17.55	155,086	18.31	155,461	14.68	
201 - 399	41,202	10.90	27,804	6.62	98,676	11.65	126,762	11.97	
400 or more	60,818	16.01	58,590	13.95	182,783	21.58	413,857	39.07	
Total	378,000		420,000		847,000		1,059,000		
<b>Producing Units<sup>b</sup></b>									
1 - 25	12,281	77.58	9,799	72.05	9,408	57.02	7,920	52.80	
26 - 50	1,991	12.58	2,058	15.13	3,376	20.46	3,234	21.56	
51 - 100	899	5.69	1,093	8.04	2,147	13.01	1,968	13.12	
101 - 200	422	2.67	484	3.56	1,058	6.41	1,086	7.24	
201 - 399	154	.97	110	.81	351	2.13	486	3.24	
400 or more	82	.51	56	.41	160	.97	306	2.04	
Total	15,830		13,600		16,500		15,000		

<sup>a</sup> Source: Olson, Ross A., "A Study of Structural Changes in the Livestock Economy of Kansas," (Unpublished M.S. Thesis, Department of Economics, Kansas State University, 1967).

<sup>b</sup> Total numbers of producing units marketing grainfed cattle were derived from the sample average number of grainfed cattle marketed per producing unit and applied to data released by the Crop and Livestock reporting service, indicating the total number of grainfed cattle marketed. The percentage breakdown among the size categories were obtained from the study and applied to the Crop and Livestock Reporting Service estimates.



increased steadily over the entire period, rising from 378,000 head in 1940 to 1,059,000 head in 1963.

Considering the breakdown of size of farm categories within years, it is apparent that the number of farms marketing 25 head or less, although declining in number, still made up a significant proportion of Kansas farms formally marketing grainfed cattle in 1963. In 1940, numbers of farms in this category totalled 12,281, 77.58 percent of total farms marketing grainfed cattle. By 1963, this had dropped to 7,920 farms, but still making up 52.80 percent of total numbers of farms producing grainfed cattle. On the other hand, farms marketing 400 head or more rose from 82 to 306 over this period, while those marketing 201 to 399 head rose from 154 to 406. Numbers of farms marketing from 101 to 200 head rose from 422 to 1,086 in the 1940 to 1963 period.

The small increase in numbers of large producing farms substantially underestimated the relative importance of these in terms of total grainfed cattle marketed, however. As indicated in Table 23, grainfed cattle marketed by farms in the 400 or more size category rose from 60,518 head in 1940, 16.1 percent of total marketings, to 413,857 head in 1963, or 39.07 percent of total marketings. In 1940, farms marketing over 101 head accounted for 43.14 percent of total marketings of grainfed cattle, and by 1963 this had risen to 65.72 percent. In contrast, farms marketing under 25 head marketed 88,452 head in 1940, 23.40 percent of the total, and although total marketings of grainfed cattle in this category rose to 95,734 head in 1963, this represented only 9.04 percent of total marketings.

Somewhat similar trends in grassfed cattle and hog marketings appear to have occurred. (Tables 24 and 25) However, numbers of units marketing 400 head or more grassfed cattle did not show the increase that occurred with

TABLE 24. — Number and percent of producing units and grassfed cattle marketed by size of operation, for years 1950, 1960, and 1963, Kansas<sup>a</sup>

Size category	1950		1960		1963	
	Number	Percent	Number	Percent	Number	Percent
<b>Grassfed cattle</b>						
1 - 25	475,680	39.64	372,349	26.73	407,611	20.35
26 - 50	212,880	17.74	258,680	18.57	360,540	18.00
51 - 100	165,720	13.81	272,889	19.59	362,543	18.10
101 - 200	139,080	11.59	216,194	15.52	381,171	19.03
201 - 399	78,000	6.50	120,077	8.62	226,539	11.31
400 or more	128,760	10.72	152,812	10.97	264,596	13.21
Total	1,200,000		1,393,000		2,003,000	
<b>Producing units<sup>b</sup></b>						
1 - 25	77,238	85.82	47,769	73.49	39,348	65.58
26 - 50	7,830	8.71	9,354	14.39	10,968	18.28
51 - 100	3,051	3.39	4,979	7.65	5,400	9.00
101 - 200	1,269	1.41	2,028	3.12	2,910	4.84
201 - 399	378	.42	566	.87	936	1.56
400 or more	225	.25	312	.48	444	.74
Total	90,000		65,000		60,000	

<sup>a</sup> Source: Olson, Ross A., "A Study of Structural Changes in the Livestock Economy of Kansas," (Unpublished M.S. Thesis, Department of Economics, Kansas State University, 1967).

<sup>b</sup> The number of producing units marketing grassfed cattle was determined by deducting the estimated number of grainfed cattle farms from Census of Agriculture records, which reported the total number of farms marketing cattle.

TABLE 25. — Number and percent of producing units and hogs produced by size of operation, for years 1940, 1950, 1960, and 1963, Kansas<sup>a</sup>

Size categories	1940		1950		1960		1963	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Hogs								
1 - 25	695,794	36.64	436,000	20.00	91,863	5.19	51,960	2.29
26 - 50	594,957	31.33	622,810	28.53	221,604	12.52	134,098	5.91
51 - 75	235,096	12.38	380,934	17.45	205,143	11.59	146,351	6.45
76 - 149	239,084	12.59	447,733	20.51	401,259	22.66	313,349	13.81
150 - 299	98,178	5.17	242,750	11.12	582,507	32.91	965,008	42.52
300 or more	35,891	1.89	52,174	2.39	267,801	15.13	658,464	29.02
Total	2,183,000		1,899,000		1,770,000		2,269,000	
Producing units								
1 - 25	59,069	70.32	34,029	53.17	10,319	27.89	6,194	18.78
26 - 50	17,640	21.00	17,536	27.40	9,424	25.47	6,329	19.18
51 - 75	3,998	4.77	6,304	9.85	5,295	14.31	4,099	12.42
76 - 149	2,663	3.17	4,666	7.29	6,316	17.07	5,392	16.34
149 - 299	544	.66	1,344	2.10	4,821	13.03	8,705	26.38
300 or more	67	.08	122	.19	825	2.23	2,277	6.90
Total	84,000		64,000		37,000		33,000	

<sup>a</sup> Source: Olson, Ross A., "A Study of Structural Changes in the Livestock Economy of Kansas," (Unpublished M.S. Thesis, Department of Economics, Kansas State University, 1967).

the larger units of the grainfed cattle producers. In the case of hogs, farms producing 150 to 200 head increased almost as much in proportion as did units marketing over 300 head. Number of farms marketing both grassfed cattle and hogs also dropped sharply in number over the 1940 to 1963 period, the drop in farms producing hogs being particularly great. (Table 25)

A definite declining trend has been evident in all districts of Kansas in the percent of grainfed cattle marketed by the under 25 head category in the 1940-1963 period.<sup>18</sup> While a slightly declining trend occurred in the percent of grainfed cattle marketed in the 25 to 50 head category, no definite trend was evident in the 51 to 100 head and the 100 to 200 head size category. In contrast, a marked trend towards increased numbers of farms feeding 201 to 399 head occurred in the northern area of the state, whereas in the balance of the state, trends tended to be erratic. Farms marketing more than 400 head have shown a considerable growth both in number and in percent of marketings accounted for, this change occurring to the largest extent in the southwestern area of the state. The number of farms marketing more than 400 head of cattle still accounted for a relatively small proportion of the total number of farms, however. As numbers of grainfed cattle have increased, there apparently has been a shift in concentration of marketings from the east to the southwest.

As indicated by Olson,<sup>19</sup> large numbers of the small producers of grassfed cattle are located in the northern and eastern regions of the state. On the other hand, the larger producers, those marketing 201 head or more, tended to be concentrated in the southern and western areas. There has been an increasing

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<sup>18</sup> Ibid. Appendix Table 2.

<sup>19</sup> Ibid. Appendix Table 3.

trend towards larger size in all areas.

There has been a relatively small change in concentration of producers of grassfed cattle by size category. However, as size increases, there is a definite pattern of location. As the producing unit gets larger, the area of concentration of production tends to shift southward and westward. The greatest concentration of large grassfed cattle marketing units are located in the southwest, whereas the smaller units are located in the northeastern area of the state.

Data developed by Olson,<sup>20</sup> indicate that the number of hogs marketed by the small size categories, and the number of units in these size categories are becoming relatively less important. Numbers of large scale units of production, and proportion of hogs marketed by the larger units have increased substantially over the 1940-1963 period. This change has been fairly uniform in all crop districts in the state.

While there is no particularly definite change in the concentration of hog production within the size categories, there is a definite pattern of location of farms included in the size categories. Producers marketing from 1 to 25 head were predominant in the southeastern areas. As size of production unit increased, concentration shifted from the southeast to the northeast and northcentral areas. Production is lightest in the western crop districts, with the least concentration occurring in this area. Most of the large scale producing units, and the largest proportion of hogs are located in the northeast and northcentral areas.

#### Trends in Kansas Livestock Population

Number of cattle and calves on Kansas farms declined in the early post

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<sup>20</sup>

Ibid. Appendix Table 6.

war years. (Table 26) The post war downward adjustment was reinforced by unexpected high prices, which encouraged high marketing levels and subsequent high slaughter in relation to inventory numbers. The expanded market for grains in Europe also tended to discourage livestock production, and cattle numbers reached a post war low in 1947 in Kansas, and in 1948 in the United States.

Encouraged by high prices and improved pasture and feed supplies, cattle numbers in the United States began to increase in 1949. Numbers in Kansas rose from 3,326,000 head in 1947 to 4,341,000 head in 1952, an increase of 30.3 percent. In contrast, numbers in the United States rose only 9 percent. However, while national numbers continued to rise during the next 4 years, numbers in Kansas remained fairly steady until 1956, when an intensification of the 4 year dry period contributed to a reduction in numbers. While the earlier year of the dry period were confined primarily to the western and mid-western state, the 1956 drought was not. However, Kansas was affected more severely than most states.

From the 1957 low, cattle numbers in Kansas rose sharply, and have since showed a strong upward trend, increasing 53 percent in the period 1957 to 1964. Over the comparable period, numbers in the United States have increased only 15 percent. In 1947, the number of cattle in Kansas represented 4.1 percent of the national total. By 1955 this had risen to 4.6 percent, and by 1964 to 5.4 percent.

Beef cattle numbers have increased in all districts in Kansas over the post war period. (Table 27) The greatest increase, however, occurred in the western and northern areas of the state. From 1945 to 1964, numbers in the Southwest district increased the most in percentage terms, rising from 331,600 head to 611,500 head over this period, an increase of 84.4 percent.

TABLE 26. — Cattle and calves on farms, Kansas and the United States,  
January 1, 1945-1967<sup>a</sup>

Year	United States <sup>b</sup>		Kansas	
	All cattle and calves	Beef cattle <sup>b</sup> and calves	All cattle and calves	Beef cattle <sup>b</sup> and calves
	thousand head			
1945	85,573	44,724	3,776	3,424
1946	82,235	43,686	3,723	2,997
1947	80,554	42,871	3,335	2,677
1948	77,171	41,002	3,335	2,969
1949	76,830	41,560	3,591	2,969
1950	77,963	42,508	3,627	2,909
1951	83,093	46,685	3,911	3,307
1952	88,072	52,837	4,341	3,767
1953	94,241	58,320	4,341	3,676
1954	95,679	59,518	4,298	3,730
1955	96,592	61,231	4,341	3,806
1956	96,804	62,067	4,211	3,703
1957	92,860	60,232	3,538	3,050
1958	91,176	60,335	3,961	3,497
1959	93,322	62,614	4,476	4,035
1960	96,236	66,055	4,429	4,039
1961	97,139	67,203	4,562	4,176
1962	99,500	69,695	4,973	4,599
1963	103,754	74,907	5,222	4,867
1964	106,743	79,104	5,431	5,104
1965	109,000	83,450	5,159	4,848
1966	108,862	84,864	5,735	5,354
1967	108,491	85,612	5,506	5,149

<sup>a</sup> Source: United States Department of Agriculture, Report of the Agricultural Marketing services, "Livestock and Meat Statistics," 1966.

<sup>b</sup> Includes cows, heifers and calves not for milk, all steers and bulls.

TABLE 27. — Number of beef cattle on Kansas farms, by crop district, Kansas, Jan. 1, 1945-1965<sup>a</sup>

Year	North West	West Central	South West	North Central	Central	South Central	North East	East Central	South East
thousand head									
1945	238.7	256.6	331.6	402.9	448.5	536.9	317.0	429.0	472.0
1946	230.5	231.8	259.4	346.4	391.4	424.4	286.6	376.1	454.4
1947	205.5	215.1	267.6	333.8	366.1	375.4	274.0	387.9	414.6
1948	195.7	206.1	222.2	312.5	343.3	370.5	258.0	363.0	405.7
1949	202.0	213.8	249.8	349.0	395.3	429.3	283.5	402.1	444.2
1950	210.5	233.4	268.1	348.9	373.3	406.3	297.4	416.9	444.2
1951	213.5	246.6	264.1	363.2	393.8	447.6	343.1	489.5	545.6
1952	257.7	307.4	312.4	421.5	450.9	505.2	371.8	523.5	616.7
1953	272.5	262.8	263.8	456.1	472.3	493.0	381.4	536.1	629.1
1954	270.2	256.8	266.4	451.1	489.6	499.7	363.7	504.5	628.0
1955	282.7	268.3	317.6	475.9	471.6	464.2	415.1	526.4	584.2
1956	235.5	242.8	320.1	405.3	448.8	489.9	398.9	572.4	589.6
1957	190.0	158.0	88.1	345.3	330.6	380.9	353.9	528.3	573.9
1958	233.0	231.5	279.0	405.5	409.0	469.0	373.0	550.5	546.5
1959	273.0	261.6	326.1	453.8	488.5	551.9	422.6	629.4	628.1
1960	270.0	295.0	381.0	472.0	473.5	530.5	405.5	586.5	625.0
1961	281.0	311.5	399.5	483.0	489.0	555.5	420.0	602.0	634.5
1962	324.0	354.5	486.0	526.5	544.0	617.0	446.0	624.0	677.0
1963	356.0	386.3	561.4	550.5	566.1	667.2	453.2	637.3	689.0
1964	376.7	387.4	611.5	589.6	594.5	684.0	472.8	656.5	731.0
1965	299.6	320.6	504.6	559.0	555.1	627.0	504.6	697.0	780.5

<sup>a</sup> Source: Kansas State Board of Agriculture, "Annual Reports", 1945-46 to 1965-66.



By way of contrast, numbers in the South Central district increased from 526,900 to 684,000 head, an increase of only 29.8 percent. The Central district has also shown a relatively small increase over the same period, from 448,500 head in 1954 to 594,500 head in 1964, an increase of only 32.5 percent. All other districts have experienced increases substantially over the state average of 44 percent.

While the western districts generally have experienced the largest increase in beef cattle numbers, and have thus shared to a larger extent in the increase in the Kansas total, they have also suffered the largest fluctuation, falling to very low levels in 1957, but experiencing a rapid rate of increase since that time. The central districts, except North Central, have had the least growth in proportion, but have also been subject to fluctuations of a considerable order. The eastern districts, on the other hand, have experienced a comparatively steady rate of growth which has often continued despite reductions in other areas of the state. In general, the greatest expansion has taken place in the districts that had the fewest cattle in the early post war period. Hence there has been a string trend towards a more even distribution of cattle within the state, particularly within the past 10 years.

As with cattle, and for much the same reasons, numbers of hogs on Kansas farms declined in the early post war years, reaching a low of 1,094,000 head in 1948 but increasing sharply to 1,504,000 head in 1951. However, while cattle numbers then remained relatively constant until 1956, hog numbers dropped sharply in 1953 and 1954 and remained at fairly low levels until 1957, when a sharp upward trend, coincident with that in cattle numbers, was initiated. (Table 28)

Approximately the same trends were evident in the United States as in Kansas, with the hog population dropping from 59,373,000 head in 1945 to

TABLE 28. — Hogs, and sheep and lambs on farms, Kansas and the United States, January 1, 1945-65<sup>a</sup>

Year	Hogs		Sheep and lambs	
	Kansas	United States	Kansas	United States
	thousand head			
1945	1,395	59,373	1,395	39,609
1946	1,420	61,306	1,221	35,525
1947	1,176	56,810	1,353	31,805
1948	1,094	54,590	724	29,486
1949	1,182	56,257	662	26,940
1950	1,253	58,937	796	26,182
1951	1,504	62,269	701	27,253
1952	1,489	62,117	646	28,050
1953	968	51,755	577	27,700
1954	774	45,114	653	27,079
1955	815	50,474	634	27,137
1956	929	55,304	594	26,890
1957	808	51,897	606	26,348
1958	840	51,517	704	27,167
1959	1,067	58,045	883	28,108
1960	1,177	59,026	756	28,849
1961	1,142	35,506	814	28,571
1962	1,302	57,000	848	27,065
1963	1,393	58,883	731	25,731
1964	1,365	58,119	665	24,348
1965	1,310	53,052	407	23,341

<sup>a</sup> Source: United States Department of Agriculture, Report of the Agricultural Marketing Services, "Livestock and Meat Statistics, 1966.

54,590,000 in 1948, and then rising to 62,117,000 head in 1952. Numbers then fell sharply in both Kansas and the United States in total, reaching a low of 774,000 in Kansas and 45,114,000 head in the United States in 1954.

Prior to 1954, Kansas experienced much greater fluctuation in hog numbers than did the United States as a whole. Since 1954, however, the opposite has been the case. Numbers of hogs on Kansas farms were relatively steady from 1954 to 1957, and have since moved upwards at a fairly steady rate, rising from 774,000 head in 1954 to 1,393,000 head in 1963. Numbers of hogs on Kansas farms dropped slightly in 1964 and 1965, however, perhaps as a result of lower livestock prices and higher feed costs occasioned by increased competition from cattle and poultry production, and an increased export market for domestic feed grains.

When the entire post war period is considered, numbers of hogs on farms in both Kansas and the United States have tended to decline. Except for the period 1951-1952 and 1960, hog numbers have not regained their early post war levels. Kansas has, however, increased its share of total hog numbers, rising from 2.3 percent of the national total in 1945 to 2.5 percent of the national total in 1965.

Hog numbers on Kansas farms over the 1954-64 period have shown a relatively slight decline, with increases in the North Central, Central, and South East districts not quite offsetting declines in the South Central and North East districts. (Table 29) Hog numbers in all other crop districts were almost exactly the same in 1964 as in 1945. Numbers in the North Central district increased 23 percent over this period, rising from 202,000 head in 1945 to 248,000 head in 1964. Numbers in the Central district increased 9 percent from 105,000 in 1945 to 115,000 in 1964. By way of contrast, numbers in the South Central district dropped 19 percent from 139,000 in 1945 to 117,000 in

1964. In the North East district, numbers dropped slightly under 5 percent.

Numbers of hogs on farms in Kansas have shown more frequent and more violent fluctuations than cattle, as might be expected from the differences in the production characteristics of the two types of livestock. The fluctuation has been roughly of the same amplitude in all districts except for the eastern ones, which have shown much the same stability in hog production as in the production of cattle.

Numbers of stock sheep on farms in the United States in the post war period have tended to decline. The decline, however, has not been a steady one. Much the same trends also occurred in Kansas. Stock sheep numbers dropped sharply in the early post war years in both Kansas and in the United States in total, but by 1950 had stabilized. (Table 29) The extent of the drop was quite large, numbers in the United States falling from 39,600,000 head in 1945 to 26,500,000 head in 1950. In Kansas, numbers of stock sheep on farms dropped from 1,395,000 to 662,000 head over the same period.

Following 1950, numbers in the United States and in Kansas remained relatively stable, showing no marked trend upwards or downwards until 1960 for the United States and 1962 for Kansas, when the slight upward trend that manifested itself in the late 1950's was arrested and a strong downward trend appeared to resume. In the United States, numbers of stock sheep reached their highest level in 12 years in 1960, 28,800,000 head, but subsequently declined to 23,300,000 head in 1965. In Kansas, a high of 883,000 head was reached in 1959, and except for 1962 when 'imports' of lambs seemed exceptionally heavy, numbers of stock sheep on Kansas farms dropped steadily to 407,000 in 1965.

The reasons for this general decline are several, and in most cases are

TABLE 29. -- Number of hogs on farms by crop district, Kansas, January 1, 1945-1965<sup>a</sup>

Year	North East	West Central	South West	North Central	Central	South Central	North East	East Central	South East
thousand head									
1945	72.0	25.0	34.0	202.0	105.0	139.2	319.2	250.4	189.2
1946	87.9	31.8	36.4	252.0	106.0	134.8	360.0	256.0	194.1
1947	67.0	20.3	27.1	202.8	78.5	94.4	326.2	217.3	142.4
1948	64.0	22.0	29.0	182.0	72.0	95.0	290.0	197.0	143.0
1949	63.0	24.0	30.0	206.0	75.0	103.0	304.0	217.0	160.0
1950	72.5	26.4	31.6	223.1	79.5	98.0	319.6	238.3	165.0
1951	66.4	26.2	24.4	215.5	92.1	124.6	382.2	313.5	259.1
1952	63.3	28.5	27.0	230.3	100.7	134.4	367.3	294.2	243.0
1953	45.8	19.4	15.4	142.6	60.4	90.8	268.1	179.5	145.8
1954	35.7	12.6	9.4	124.6	39.3	64.5	230.6	143.6	113.7
1955	36.0	11.0	13.6	128.0	60.0	59.0	245.0	156.0	106.5
1956	41.5	13.5	17.5	134.5	72.0	67.5	264.5	190.0	128.0
1957	34.0	8.8	13.6	101.0	58.3	59.4	243.0	167.0	122.9
1958	43.0	13.0	15.0	125.0	64.0	63.0	240.0	160.0	118.0
1959	59.0	21.0	24.0	163.0	85.0	94.0	267.0	195.0	160.0
1960	62.0	23.0	26.0	179.0	88.0	105.0	290.0	214.0	190.0
1961	58.0	20.0	26.0	189.0	87.0	102.0	280.0	210.0	170.0
1962	70.0	23.0	29.0	231.0	104.0	116.0	303.0	233.0	193.0
1963	78.0	25.0	32.0	247.0	114.0	122.0	324.0	251.0	200.0
1964	74.0	25.0	33.0	248.0	115.0	117.0	305.0	244.0	204.0
1965	75.0	19.0	30.0	237.0	108.0	105.0	295.0	231.0	183.0

<sup>a</sup> Source: Kansas State Board of Agriculture, "Annual Report," 1945-46 to 1965-66.

related to production factors. High labor requirements, the intensive management necessary, and low prices for lambs and wool as a result of international competition from such areas as Australia and New Zealand have tended to reduce sheep numbers in Kansas and in the United States as a whole. The downward trend in numbers has probably been slowed to some extent as a result of financial assistance made available to farmers under the National Wool Act, and physical limitations involved in shifting to alternative enterprises.<sup>21</sup>

While Kansas has increased its relative position in regard to other states in numbers of cattle and hogs on farms, it has not done so in regard to stock sheep and lambs. In 1945, numbers in Kansas made up 3.5 percent of the national total. By 1955 this had dropped to 2.3 percent, and by 1965 to 1.8 percent. Sheep production in Kansas and in the United States appears to have been generally supplanted by increased emphasis on the production of cattle.

Sheep numbers on Kansas farms declined in all districts over the entire 1945 to 1965 period, the greatest declines occurring in the areas in which numbers of beef cattle have shown the greatest increase. (Table 30) In the western districts, numbers of stock sheep on farms in 1965 ranged from one-quarter to one-sixth of the 1945 total. The central districts experienced the least decline in numbers of stock sheep on farms in the state, with the smallest decline in the Central district, dropping 12.5 percent over the period.

As with cattle and hogs, the western districts have experienced the greatest fluctuation, but in contrast with fluctuations in hog numbers, the fluctuation in the number of stock sheep on farms appears closely related

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<sup>21</sup> Taylor, M.H., "The Feasibility of Expanding Livestock Feeding and Meat Packing in Utah, Part I," (Utah State University, Logan, Utah, July, 1965) p. 14. This study is one of 4 dealing with the above subject, and contains a good description and analysis of the decline in sheep numbers in the United States over much of the past half-century.

TABLE 30. — Numbers of sheep and lambs on farms, by crop district, Kansas, January 1, 1945-1965

Year	North West	West Central	South West	North Central	Central	South Central	North East	East Central	South East
thousand head									
1945	118.6	157.9	447.4	75.1	80.5	221.3	93.3	117.6	83.3
1946	160.4	184.6	375.2	53.0	63.4	147.0	74.3	95.8	67.3
1947	107.2	179.3	646.1	55.2	57.7	124.7	55.6	71.7	55.5
1948	41.6	64.4	198.2	32.1	38.9	164.4	61.6	66.6	56.2
1949	59.9	81.0	147.8	31.6	89.6	111.3	65.9	71.4	52.6
1950	101.5	85.7	282.9	32.7	34.2	94.1	46.3	62.5	56.2
1951	66.4	62.3	180.1	41.5	38.3	105.5	78.8	67.6	60.6
1952	50.4	65.7	120.6	47.2	47.4	136.0	43.1	68.1	67.7
1953	50.5	45.4	102.5	40.4	40.1	123.7	40.8	68.4	65.3
1954	59.8	58.8	171.3	39.3	38.6	117.0	47.6	58.7	61.9
1955	61.8	67.8	101.2	47.6	39.1	133.4	55.5	63.9	63.8
1956	36.9	37.4	87.8	40.7	47.3	141.9	54.8	70.3	76.9
1957	28.5	38.7	90.0	43.7	56.1	128.7	57.6	79.7	83.1
1958	44.9	57.1	110.6	45.3	60.1	173.9	56.8	77.8	77.6
1959	118.0	99.4	175.8	51.4	65.7	157.7	65.5	72.0	77.4
1960	81.3	60.7	136.6	53.7	64.5	154.7	51.0	77.1	76.3
1961	54.0	96.0	144.0	68.5	75.5	195.9	43.7	67.7	68.7
1962	79.0	89.0	139.0	65.6	84.1	206.9	46.5	72.1	65.8
1963	69.0	36.0	115.0	60.3	87.7	205.0	46.3	56.0	55.7
1964	68.0	28.5	104.5	62.3	82.3	176.3	38.2	58.0	46.9
1965	28.0	23.0	67.0	56.8	70.3	169.6	42.3	50.0	45.0

<sup>a</sup> Source: Kansas State Board of Agriculture, "Annual Report," 1945-46 to 1965-66.

to wheat pasture conditions. A larger amount of lamb feeding is carried out in the western areas. Variability in import levels are directly reflected in January 1 inventory data from which this analysis is derived.

### Trends in Kansas Livestock Marketings

Marketings of cattle and calves have followed approximately the same trends as numbers of cattle on farms in Kansas, and for approximately the same reasons. Some minor variation in marketing trends has occurred from those in population, however, and these can be traced to essentially two sources: the extended lag occurring in cattle marketings during the upswing in the cattle cycle as farmers and ranchers withhold heifers and cows from the market in order to expand the breeding herd, and the allied extension of the peak in marketings when cattle numbers turn down; and variations in volume of movements of cattle for feeding into Kansas, which are more closely related to grain supplies, both in Kansas and in the areas which compete with Kansas for feeder cattle supplies.

Marketings of cattle in Kansas have expanded at a much more rapid rate than cattle population, rising from 1,77,000 head in 1947 to 3,112,000 head in 1964, an increase of 81.2 percent. (Table 31) Over the same period, numbers of all cattle and calves on farms in Kansas rose only 63.5 percent. While part of this increase can be attributed to 'imports' of feeder cattle, many of these cattle would also be included in the population figures. As marketings of calves over the 1947 to 1964 period dropped from 217,000 head to 46,000 head in Kansas, there is a strong indication that Kansas farmers are feeding an increased proportion of their own feeder calf production, this accounting for much of the increase in marketings of cattle.

The increase in marketings of Kansas cattle is substantially larger



than that for the West North Central states and for the United States as a whole. Marketings of calves have not dropped nearly as much in the West North Central states as in Kansas, and marketings of calves in the United States have dropped only slightly. In-shipments of cattle have risen in approximately the same proportion in the West North Central states as in Kansas, this being somewhat larger than in the United States in total.

As with cattle, marketings of hogs in Kansas have tended to follow trends in population numbers. Because of the much shorter gestation period and growth period for hogs, however, the correspondence has been relatively much closer for hogs than for cattle. Since 1958, while the fluctuations in marketings have tended to match those in hog population, numbers marketed have increased at a much faster rate. Numbers on farms in Kansas in 1964 were little changes from those in the 1845 to 1948 period, yet numbers marketed increased from 1,516,000 head in 1945 to 2,157,000 head in 1964, an increase of 47 percent.

Part of this increase may be traced to increased in-shipment of hogs for feeding and breeding in Kansas, the number of these hogs rising from 22,000 in 1945 to 101,000 in 1964. It is apparent, however, that this accounts for only a small proportion of the difference between the increase in numbers and the increase in marketings. Much of the increase in marketings would thus appear to be due to an increased efficiency of production - higher litter size, less mortality, and the increased tendency to farrow sows two or more times per year.

Much the same trends are evident in the West North Central states and in the nation. In-shipments have increased in greater proportion than in Kansas, but the proportional increase in marketings as compared with hog population has only been about 40 percent in both areas over the post war period,

TABLE 31. — Marketings of livestock and livestock shipped in, Kansas, West North Central States, and United States total, 1945-1964<sup>a</sup>

Year	Marketings of cattle <sup>b</sup>			Marketings of calves <sup>b</sup>			Cattle shipped in		
	Kansas	West North Central	United States	Kansas	West North Central	United States	Kansas	West North Central	United States
thousand head									
1945	1,952	10,712	29,391	270	2,316	13,197	615	3,574	8,254
1946	1,743	9,808	26,188	275	2,170	12,656	710	3,728	8,877
1947	1,717	10,155	29,955	216	2,562	14,117	595	3,484	8,281
1948	1,367	8,122	23,370	160	2,084	12,728	707	3,163	7,620
1949	1,649	8,924	23,281	162	2,162	12,470	699	3,766	8,244
1950	1,471	8,556	22,684	127	1,948	11,975	723	3,735	8,869
1951	1,460	7,993	22,638	94	1,682	11,332	715	3,746	9,174
1952	1,631	8,702	23,821	156	1,851	11,957	521	3,919	9,081
1953	1,842	10,848	28,241	172	2,165	14,309	490	3,311	8,294
1954	1,953	11,379	30,563	174	2,370	15,464	593	4,631	10,065
1955	1,994	11,905	31,407	186	2,381	15,411	607	4,335	10,048
1956	2,228	12,399	33,530	289	2,600	15,807	522	4,349	10,629
1957	1,473	11,647	32,508	93	2,295	15,079	841	5,074	11,092
1958	1,738	11,649	30,385	56	1,938	13,927	1,114	5,807	12,309
1959	2,052	12,609	31,552	49	1,796	12,736	1,053	6,190	13,162
1960	2,226	12,687	34,429	51	1,611	11,979	1,144	5,849	13,313
1961	2,427	12,956	35,177	42	1,602	11,882	1,523	6,726	14,549
1962	2,552	13,519	36,388	49	1,483	12,012	1,644	7,196	16,498
1963	2,840	14,262	37,784	46	1,398	11,824	1,638	7,105	15,795
1964	3,112	15,778	40,532	53	1,378	12,145	1,377	7,249	15,503

<sup>a</sup> Source: United States Department of Agriculture, "Agricultural Statistics," (Superintendent of Documents, United States Government Printing Office, Washington, D.C.), 1945-1966.

<sup>b</sup> Excludes interfarm sales.

TABLE 31. (Continued). -- Marketings of livestock and livestock shipped in, Kansas, West North Central States, and United States total, 1945-1964<sup>a</sup>

Year	Marketings of hogs <sup>b</sup>			Hogs shipped in for feeding and breeding <sup>c</sup>		
	Kansas	West North Central	United States	Kansas	West North Central	United States
	thousand head					
1945	1,516	28,765	60,959	22	128	464
1946	1,666	32,388	64,370	21	136	464
1947	1,482	31,497	63,534	24	180	497
1948	1,094	28,256	56,352	20	181	457
1949	1,463	33,321	69,806	27	256	451
1950	1,535	34,695	71,968	23	273	580
1951	1,916	38,622	79,316	21	406	755
1952	1,778	39,258	81,506	17	404	717
1953	1,202	34,785	71,526	41	588	811
1954	1,094	34,051	69,360	42	815	1,081
1955	1,228	38,052	74,832	47	766	1,079
1956	1,328	37,570	77,840	59	782	1,383
1957	1,175	34,781	74,618	61	827	1,464
1958	1,185	35,280	73,835	68	991	1,907
1959	1,552	41,069	84,397	80	1,283	2,286
1960	1,633	37,882	80,087	78	1,542	2,463
1961	1,766	38,436	80,065	76	1,067	2,231
1962	1,993	39,026	81,660	96	1,089	2,580
1963	2,157	41,500	85,425	101	1,270	2,712
1964	2,191	41,921	86,259	106	1,110	2,560

<sup>a</sup>Source: United States Department of Agriculture, "Agricultural Statistics," (Superintendent of Documents, United States Government Printing Office, Washington, D.C.) 1945-1966.

<sup>b</sup> Excludes interfarm sales

<sup>c</sup> Includes hogs shipped in from other states, but excludes intrastate shipments.

TABLE 31. (Continued). -- Marketings of livestock and livestock shipped in, Kansas, West North Central States, and United States total, 1945-1964<sup>a</sup>

Year	Marketings of sheep <sup>b</sup>			Marketings of lambs <sup>b</sup>			Lambs shipped in <sup>c</sup>		
	Kansas	West North Central	United States	Kansas	West North Central	United States	Kansas	West North Central	United States
	thousand head								
1945	172	1,752	7,257	1,400	7,693	24,986	1,043	3,893	7,005
1946	104	1,113	6,496	1,204	7,413	24,172	1,080	3,822	6,808
1947	141	1,133	5,052	1,307	6,672	21,116	517	2,927	6,000
1948	79	805	4,620	823	5,468	19,262	678	2,638	5,632
1949	73	675	3,432	713	4,891	16,990	637	2,499	5,224
1950	86	463	2,627	1,211	3,086	16,440	864	3,160	5,916
1951	57	459	3,133	753	4,418	15,381	455	2,715	5,816
1952	95	590	3,060	666	5,005	17,319	293	2,610	5,387
1953	70	648	3,133	427	4,997	18,049	261	2,243	4,711
1954	76	509	3,015	672	5,554	18,750	370	2,580	3,095
1955	20	484	2,827	579	5,481	18,804	237	2,285	4,785
1956	32	498	3,234	579	5,489	19,395	279	2,626	5,592
1957	41	497	2,227	498	5,565	18,336	289	2,528	5,028
1958	54	572	2,357	709	5,599	18,260	572	2,682	5,252
1959	61	760	2,689	789	6,101	19,187	359	2,762	5,903
1960	29	627	3,172	639	6,295	19,509	382	2,974	5,475
1961	36	823	3,842	794	6,366	19,985	529	2,790	5,385
1962	72	812	3,192	724	5,903	19,207	350	2,432	5,211
1963	109	771	3,262	677	5,506	18,568	360	2,255	4,946
1964	71	598	2,919	667	5,417	17,341	292	2,223	4,842

<sup>a</sup> Source: United States Department of Agriculture, "Agricultural Statistics," (Superintendent of Documents, United States Government Printing Office, Washington, D.C.) 1945-1966

<sup>b</sup> Excludes interfarm sales.

<sup>c</sup> Includes lambs shipped in from other states and from central markets, but excludes intrastate shipments.

perhaps indicating a greater efficiency of production in Kansas, and perhaps also reflecting the somewhat less extreme weather conditions.

Marketings of sheep and lambs have also tended to follow trends in sheep population in Kansas, dropping sharply in the early post war years to 1950, and showing a significant trend upwards only in the late 1950's and early 1960's, and since then tending to decline. Trends in marketings of sheep and lambs in Kansas have followed those in the West North Central states and the United States very closely, indicating that factors other than purely local ones were responsible for much of the variation that did occur. (Table 31)

Much more significant, however, is the apparent reduction in lamb feeding in Kansas relative to other areas. As indicated in Table 31, in 1945, 1,043,000 head of sheep and lambs were shipped into Kansas, but by 1964 this had dropped to only 292,000 head, a drop of 72 percent. By way of contrast, numbers shipped into the West North Central states dropped only 42.6 percent, and in the United States only 35.3 percent. It is apparent that lamb feeding has been supplanted to a considerable degree by the feeding of cattle and calves.

### Conclusions

Kansas livestock producing units have grown sharply in size during the post war period. While the largest growth in unit size has been in the production of grainfed cattle and hogs, enterprises producing grassfed cattle have also increased moderately in size. Concomittant with increasing concentration, production of livestock in Kansas, as indicated by the growth in livestock population and marketings, has also increased at a high rate, particularly in the latter half of the post war period. Production, as

well as concentration has tended to shift towards the western area of the state. Production has also increased in other areas of the state, but by a smaller proportion.

Provided that the factors influencing the formation of these trend in the past and at present continue in large part unchanged into the future, livestock production in Kansas should continue to increase, particularly in the West.

## CHAPTER VI

### POTENTIAL FOR EXPANSION IN THE KANSAS LIVESTOCK AND MEAT PACKING INDUSTRIES

#### Introduction

Growth of the Kansas livestock and meat packing industries will depend in part on the growth in demand for meat products in markets accessible to Kansas producers. It will also depend upon the ability of Kansas producers to satisfy larger proportions of such market demand in competition with producers in other states. This chapter will be concerned with the potential demand for Kansas meat products to 1975, and an attempt will be made to determine the potential for expansion of the livestock feeding industry. In view of the generally declining trend in the production of sheep and lambs, only cattle and calves and hogs will be considered in regard to their potential for expansion in the future.

#### Potential Demand for Kansas Meat Products

Recent studies carried out by the Department of Economics, Kansas State University, would appear to be relevant to the problem under consideration. This section will primarily consist of a discussion and presentation of these results.

The method used in these studies was that a spatial equilibrium analysis, in which three or more spatially separated markets are assumed to be in equilibrium. Transportation costs tie the system together, independently of volume or direction. The final equilibrium solution yields a set of regional

equilibrium prices that result in :

- 1) All production moving into consumption,
- 2) The establishment of directional patterns of trade for all possible pairs of regions,
- 3) The quantification of regional trade flows, and
- 4) The determination of the total transportation bill for interregional trade.

This type of analysis is useful in determining the distributive efficiency of existing or projected future situations in a competitive economy. It is in the latter use that the results are of interest in this study, particularly as they refer to potential demand for Kansas meat products. These studies do, however, have several limitations.

- (1) Due to lack of adequate area data, a national consumption estimating function was applied to individual areas.
- (2) Freight rates are changed from time to time. Subsequent changes could result in different price relationships from those calculated ...
- (3) Population and income projections are, of course, subject to error.
- (4) Consumer preference for beef (or pork) may change.
- (5) No attempts (were) made to determine the relative costs of producing beef (or pork) in the various surplus producing areas ...
- (6) No consideration was given to imports and exports.<sup>22</sup>

In regard to the demand for pork, it was considered that population growth in the West and Southwest would be a significant development.<sup>23</sup> By 1975, it was estimated that the West and Southwest would have 21.1 million more people than in 1957, the base year of the study. By virtue of closer

<sup>22</sup> Kelley, P.L., McCoy, J.H., and Manuel, M.L., "The Competitive Position of Kansas in Marketing Beef," Technical Bulletin 129, (Kansas Agricultural Experimental Station, Kansas State University, August, 1963).

<sup>23</sup> McCoy, J.H., Goetzinger, J., Kelley, P.L., and Manuel, M.L., "The Competitive Position of Kansas in Marketing Hogs," Technical Bulletin 118, (Kansas Agricultural Experimental Station, Kansas State University, October, 1961).



geographic location, it was considered that Kansas may effectively compete with other areas in supplying at least part of this new demand for pork. Per capita disposable incomes were expected to increase 54.94 percent by 1975 over 1957 levels. A demand equation of the straight least squares type was fitted for the United States, and used to derive parameter values needed for projection.

Given equilibrium prices for pork as determined in the study, current freight rates, projections of population and per capita disposable income for 1975, prevailing prices for beef, it was estimated that total consumption of pork in 1975 would equal 13,649 million pounds, or 30 percent more than in 1957. This estimate is still somewhat higher than the commercial production of pork in 1964, which totalled 12,019 million pounds.<sup>24</sup> Hence, a considerable potential for expansion in pork production would still appear to exist.

The major conclusions of the study are as follows:

Phenomenal increases in population are occurring in the West and Southwestern regions of the United States. By 1975 it is anticipated that 30 percent more pork will be needed than was consumed in 1957 (14 percent more than in 1964) in the United States. A major part of this new demand is expected in the West and Southwest. Kansas hog producers are located strategically to fulfill at least part of the new demand ... Substantial reductions were indicated in transportation costs of dressed pork compared with live hog shipments. This points to possible important implications with respect to location of marketing and slaughtering facilities. These in time carry implications for increased off-farm employment for a declining farm population.<sup>25</sup>

In regard to the demand for beef, population growth in the West and Southwest was also considered a significant development.<sup>26</sup> Compared with

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<sup>24</sup> United States Department of Agriculture, "Livestock and Meat Statistics," Report of the Marketing Services, Sept. 1965, p. 82.

<sup>25</sup> McCoy et al., op. cit., p. 36.

<sup>26</sup> Kelley, et al., op. cit., p. 5.

1959, the base year of this study, population in the United States was expected to rise 40.3 percent to almost 247 million. Again, as a large proportion of this expansion was considered to probably take place in the West and Southwest, Kansas, by virtue of close geographical proximity, could be expected to be relatively competitive in supplying the increasing market. Per capita disposable income was expected to rise 48.7 percent over the 1959-1975 period, and this was considered a much more important factor for beef than for pork because of the substantially different income elasticity of demand. As in the case for pork, an estimating equation of the straight least squares type was fitted for the United States, and used to derive parameter values needed for projection.

Given equilibrium prices for beef as determined in the study, current freight rates, projections of population and per capita income, and estimates of prevailing pork prices, it was forecast that 24,880 million pounds of beef would be consumed in 1975, an increase of 50 percent over the 1959 level. Beef shipments to the West and Southwest were shown to probably increase substantially. In 1964, beef and veal production totalled 19,435 million pounds.<sup>27</sup> Hence, a large potential for the expansion of beef consumption would still appear to exist. The major conclusions of this study were as follows:

Anticipated increases in population and consumer disposable income are expected to create a substantial increase in the demand for beef in future years. By 1975, approximately 50 percent more beef will be consumed in the United States than in 1959 ... Kansas now ships most of its (surplus) beef to the Eastern and Southeastern markets ... By 1975, Kansas will be shipping beef to the West on a regular basis. There is opportunity for Kansas to hold or even to expand its market to the East and at the same time to add a substantial market in the West. Consumption of beef will increase more rapidly than production in that region.<sup>28</sup>

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<sup>27</sup> "Livestock and Meat Statistics," op. cit., p. 81.

<sup>28</sup> Kelley, et al., op. cit., pp. 26-27.

## Potential for the Increased Production of Fed Livestock in Kansas

As indicated previously, feeder livestock and feed are combined in the livestock feeding process to furnish the principle input to the meat packing industry. The supply of feeder livestock depends upon the availability of suitable range land in Kansas and the areas from which Kansas 'imports' feeder livestock, at least in the case of cattle and sheep, and upon the production of forages and feed grain. Considering the relatively large numbers of feeder cattle imported into Kansas for feeding, it would not appear that availability of suitable range land within Kansas is a vitally important factor in the expansion of the livestock feeding industry in Kansas.

In this analysis, the major limiting factors in the expansion of the livestock feeding industry in Kansas are assumed to be the supplies of forage and feed grains. In this regard, feed livestock balances have been computed for the 1954-55 to 1964-65 crop years period for Kansas as a whole, and for the crop year 1963-64 on a crop district basis.

As is indicated in Table 32, Kansas has been a grain surplus producing area for 9 out of the 11 year considered, producing an average surplus of grain over this period of 1,587,000 tons per year. This may well be an underestimate of the actual surplus, as the figure derived represents only the difference between the total amount of feed grain available as feed for livestock in Kansas, and the average available for livestock per grain consuming animal unit in the United States for the whole of each of the crop years from 1954-55 to 1964-65. In any instance, it is a very crude measure of the surplus of grain produced in Kansas, and should be interpreted in this light.

The measure does, however, give some idea of the potential for expansion in the livestock feeding industry of Kansas. In the 1954-55 to 1964-65 period, an average of 3,477,000 grain consuming animal units had an average

TABLE 32. — Grain supplies relative to consumption requirements, Kansas, 1954-55 to 1964-65

Crop year	Feed grain <sup>a</sup>			Total supply	Required <sup>b</sup> per animal unit	Animal <sup>c</sup> units fed	Total grain required	Surplus or deficit
	Production	Farm carryover	Cereal grains fed					
	thousand tons				tons	thousands	thousand tons	
1954-55	3,174	213	62	3,449	.92	3,461	3,184	265
1955-56	2,428	285	44	2,757	.94	3,376	3,173	-416
1956-57	1,934	209	41	2,184	.96	3,050	2,928	-744
1957-58	5,494	129	54	5,677	1.03	3,130	3,224	2,453
1958-59	6,183	387	76	6,646	1.08	3,436	3,711	2,935
1959-60	6,712	308	49	7,069	1.13	3,407	3,850	3,219
1960-61	7,577	418	40	8,035	1.16	3,613	4,191	3,219
1961-62	5,671	589	36	6,296	1.21	3,748	4,535	1,761
1962-63	5,901	451	29	6,381	1.21	3,850	4,658	1,723
1963-64	6,172	488	25	6,675	1.21	3,710	4,489	2,186
1964-65	4,439	422	63	4,924	1.23	3,654	4,494	430

<sup>a</sup> Obtained from "Annual Report", Kansas State Board of Agriculture, 1954-55 to 1964-65. Includes sorghum grain, corn, barley, oats, rye, and feed wheat.

<sup>b</sup> Feed requirements per animal unit are obtained from "Livestock- Feed Relationships, 1909-1965", United States Department of Agriculture. They represent average amounts of grain fed to animals in two periods, 1940-45 and 1955-59, related to total amounts of feed available per animal unit per crop year.

<sup>c</sup> Animal unit factors used in computing grain consuming animal units are those of the Kansas State Board of Agriculture. They are: milk cows and heifers 2 years old and older, 0.9; heifers and heifer calves kept for milk, 0.3; beef cows 2 years old and older, 0.10; cattle on feed, 2.1; all other cattle, 0.10; stock sheep, 0.10; horses and mules, 1.1; hogs fed during year, 0.70; hens and pullets on farms Jan. 1, 0.055; chickens raised during year, 0.02; and turkeys raised during year, 0.07.

grain requirement of 3,858,000 tons per year. With an average surplus of 1,587,000 tons of grain per year, Kansas could have over this period fed an extra 1,438 grain consuming animal units per year. This would have meant an increase in total livestock production, on the basis of available grain, of 41.1 percent. If the total surplus had been fed to fattening cattle, this would have represented an increase in the numbers of cattle fed of almost 195 percent.<sup>29</sup>

As well as having produced a surplus of grain suitable for livestock feed in the 11 year period from 1954-55 to 1964-65, Kansas has also produced a surplus of forage averaging 779,000 tons per year, as indicated in Table 33. As with the grain surplus, however, this is a calculated surplus, and must be interpreted in the same light as that for grains. It is subject to the same limitations, and is probably also an underestimate.

If it is assumed that the actual surplus of forage was as is indicated above, then Kansas could have supported an additional 508,000 forage consuming animal units, or an additional 12 percent in terms of total livestock per year over the 1954-55 to 1964-65 period. If the total surplus had been fed to fattening cattle, it would have allowed an increase in numbers fed of 283 percent.<sup>30</sup> This relatively large proportion results from the fact that cattle on feed are fed heavily on grain rather than forage.

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<sup>29</sup> There were 358,000 head of cattle on feed in Kansas on Jan. 1, 1964, representing 752,000 grain consuming animal units. On this basis, an additional 685,000 head of cattle could have been on feed at this time. In terms of fed cattle marketed, this would have represented an additional 2,050,000 head of fed cattle, or about 23 percent of the total increased consumption needs in the United States to 1975.

<sup>30</sup> The calculated proportional increase possible in carrying capacity of forage consuming animal units is derived in the same way as that for grain consuming animal units. The number is larger in this case because, while 1 steer or heifer on feed is equivalent to 2.1 grain consuming animal units, it is only equal to 0.5 forage consuming animal units.

TABLE 33. — Roughage supplies related to consumption requirements, Kansas, 1954-55 to 1964-65

Crop year	Hay <sup>a</sup>		Sorghum forage	Sorghum and corn silage	Hay equiv. <sup>b</sup> of all roughage	Animal <sup>c</sup> units fed	Req. per <sup>d</sup> animal unit	Total roughage req.	Surplus or deficit
	Production	Farm carryover							
	thousand tons					thousands	tons	thousand tons	
1954-55	3,397	353	1,630	4,704	6,133	4,185	1.27	5,319	818
1955-56	3,449	442	1,570	4,762	6,263	4,025	1.37	5,514	749
1956-57	2,433	345	1,112	4,747	4,916	3,368	1.60	5,389	-473
1957-58	4,310	219	1,883	8,632	8,348	3,739	1.73	6,468	1,880
1958-59	4,552	1,293	1,374	5,977	5,824	4,121	1.63	6,717	1,807
1959-60	3,534	1,229	1,058	5,962	7,279	4,216	1.56	6,577	702
1960-61	4,163	565	1,113	7,181	7,678	4,324	1.52	6,572	1,106
1961-62	4,270	957	946	6,728	7,943	4,706	1.55	7,294	649
1962-63	4,671	683	1,282	7,929	8,638	4,911	1.56	7,661	977
1963-64	3,734	902	1,548	8,551	8,260	5,087	1.55	7,885	375
1964-65	4,288	709	990	5,895	7,457	4,823	1.55	7,476	-19

<sup>a</sup> Kansas State Board of Agriculture, "Annual Report," 1954-55 to 1964-65

<sup>b</sup> Assumes 3 tons of silage or 2 tons of dry forage are equivalent to 1 ton of hay.

<sup>c</sup> Animal unit factors used in computing roughage consuming animal units are those of the Kansas State Board of Agriculture. They are: heifers and heifer calves kept for milk, 0.8; milk cows and heifers 2 years old and older, 1.0; beef cows 2 years old and older, 1.0; cattle on feed, 0.5; all other cattle, 0.9; horses and mules, 0.9; stock sheep, 0.2; sheep and lambs on feed, 0.58; chickens on farms Jan. 1, 0.0012; and turkeys raised during the year, 0.0024.

<sup>d</sup> United States Department of Agriculture, "Livestock- Feed Relationships, 1909-1965," p.32.

It is not likely that Kansas livestock production could actually be increased by the above calculated amounts. These estimates represent the total potential production if all forage and grain were fed. However, in order to minimize instability in livestock production that could result from fluctuations in crop yield, the Kansas livestock industry would probably operate at some lower level. However, the point is clear. A considerable expansion in the Kansas livestock industry would be possible on the basis of average 1954-55 to 1964-65 feed supply.

In order to indicate the areas of the state in which expansion of livestock production is possible, a feed-livestock balance was calculated on a crop district basis for the crop year 1963-64. This is the most recent year with a calculated surplus of grain and forage approximating the 1954-55 to 1964-65 average. The grain surplus in this year was 2,186,000 tons, slightly more than the 11 year average of 1,587,000 tons. Forage surplus in this year, however, was just 375,000 tons, somewhat less than the 11 year average of 775,000 tons. As with the feed livestock balance for Kansas in total, these figures must be interpreted as an indicated magnitude, as extensive simplifying assumptions were required in computation.

Livestock categories included were as follows: milk cows, beef cows, heifers and heifer calves kept for milk, total cattle on feed, total other cattle, stock sheep, hogs fed during the year, total numbers of chickens on farms, chickens raised during the year, and turkeys raised during the year. The categories heifers and heifer calves kept for milk, and total cattle on feed were derived from census data, on the assumption that the proportional breakdown of numbers in the various livestock classes on a district basis approximates that for the state as a whole. Total other cattle were obtained as a residual. No recent population gains or totals were available regarding

number of horses or mules by district. The difference that resulted between the total number of animal units calculated on a district basis and the state total were allocated to the various crop districts in proportion to the total number of animal units in each district.

As indicated in Table 34, the areas with the largest surplus of grain appear to be in the north and west. The Southwest and the North Central districts had by far the greatest surplus, followed by the Northeast, the Northwest, and the South Central districts in that order of importance. The Central district had a relatively small surplus, while the East Central and the Southeast districts had a small deficit.

The situation is slightly different in regard to surpluses of forage, as shown in Table 35. The South Central, North Central, and the Central districts had fairly large surpluses of forage, the Northeast had a moderate surplus, and the North West, and East Central districts had a small surplus. The West Central, South West, and the South East districts had mild to moderate deficits.

In order to determine the areas with the greatest potential for livestock expansion as measured by the availability of feed, the surplus of grains and forages must be considered together, as one could replace the other to some extent as the need arose. On this basis, the largest potential for the expansion of livestock production in Kansas would appear to be in the western and northern districts. Some small potential would appear to exist in the South Central and Central districts, while expansion in the East Central and South East districts would appear to be limited on the basis of locally produced feed supplies. It should be noted, however, that this conclusion is based on 1963-64 crop data, and is representative only insofar as this period could be considered a 'normal' year.



TABLE 34. -- Grain supplies relative to consumption requirements, Kansas, by crop districts, 1963-64

Crop district	Grains <sup>a</sup>			Requirements <sup>b</sup> per animal unit	Animal units fed	Total grain required	Surplus or deficit
	Production	Farm carryover	Total supply				
	thousand tons			tons	thousands		thousand tons
North West	385.6	30.7	416.3	1.21	197	238.4	177.9
West Central	405.2	32.7	437.9	1.21	152	184.9	253.0
South West	928.1	74.7	1,002.8	1.21	311	376.3	626.5
North Central	914.8	73.7	988.5	1.21	319	386.0	602.5
Central	492.7	39.5	532.2	1.21	378	457.4	74.8
South Central	630.6	50.8	681.4	1.21	427	516.7	164.7
North East	999.7	80.5	1,080.2	1.21	674	815.5	264.7
East Central	717.4	57.6	775.0	1.21	662	801.0	-26.0
South East	590.8	47.8	638.6	1.21	590	713.9	-75.3
State total	6,064.9	488.0	6,552.9 <sup>c</sup>		3,710	4,490.1	2,062.8

<sup>a</sup> Source: Kansas State Board of Agriculture, "Annual Report," 1964-65.

<sup>b</sup> Assumed to be constant over the state.

<sup>c</sup> Total differs slightly from that in table 33 as rye and food grains fed to livestock are not included. Rye is of minimal importance as a livestock feed, and food grains fed to livestock are not available on a crop district basis.

TABLE 35. — Roughage supplies relative to consumption requirements, Kansas, by crop district, 1963-64

Crop district	Hay		Sorghum for silage	Corn for silage	Sorghum for forage	Hay equiv. of all roughage <sup>b</sup>	Animal units fed	Req'd per animal unit <sup>c</sup>	Total roughage req'd <sup>c</sup>	Surplus or deficit
	Prod.	Farm carryover <sup>a</sup>								
	thousand tons						thousands	tons	thousand tons	
North West	160.9	38.8	499.5	178.4	190.2	511.3	311.8	1.55	483.3	28.0
West Central	101.3	24.4	547.4	112.6	344.7	498.1	337.5	1.55	523.1	-25.0
South West	162.7	39.7	404.0	326.9	296.4	594.3	455.0	1.55	705.3	-111.3
N. Central	602.0	145.2	728.7	220.0	162.8	1,144.8	590.5	1.55	915.3	229.5
Central	485.2	117.3	907.2	280.3	225.5	1,111.0	617.5	1.55	957.3	153.7
S. Central	495.5	120.0	1,199.2	231.9	236.2	1,210.6	628.4	1.55	974.0	236.6
North East	477.3	139.8	265.1	407.8	4.8	943.8	551.5	1.55	854.8	89.0
East Central	602.0	145.2	558.6	788.3	31.2	1,214.8	765.9	1.55	1,187.1	27.7
South East	547.1	131.6	333.3	417.9	20.2	939.3	828.9	1.55	1,284.8	-345.5
State total	3,734.0	902.0	5,443.0	1,512.0	2,964.0	8,168.0 <sup>d</sup>	5,087.0		7,885.0	282.7

<sup>a</sup> Total carryover allocated to each district on the basis of total production in that district.

<sup>b</sup> Calculated from data contained in Kansas State Board of Agriculture, "Annual Report," 1964-65.

<sup>c</sup> Assumed to be constant over the state.

<sup>d</sup> Total differs slightly from that in Table 34 as it is calculated from preliminary data, the only form in which it is available.

## CHAPTER VII

### SUMMARY AND CONCLUSIONS

Kansas is an increasingly important contributor to the nation's livestock industry. Over the post war period, livestock production in Kansas has increased not only in absolute terms, but also in relation to its neighboring states and the United States as a whole. As such, it has provided an increasing share of Kansas's farm cash income. This is not true of the Kansas meat packing industry, however. For, while remaining an important element in manufacturing in Kansas, it has declined in relative position over the 1945 to 1964 period. The greatest loss in relative position was in the early years of the period, but only a moderate amount of the lost ground has been regained in recent years.

There are indications that this may not continue to be the case. Technological change in the meat packing, processing and transportation industries, coupled with changes in the freight rate structure making the shipment of meat less costly than the shipment of live animals have tended to shift slaughter to the smaller, more efficient plants close to supply areas. These plants could well locate in Kansas.

A sample survey conducted among medium and large sized meat packing plants in Kansas indicate that the Kansas meat packing industry is operating at moderately full capacity. Hence, major expansion may well only come about with the construction of new facilities. While some of the meat produced by these plants is shipped on a regular basis to the eastern United States, most of the livestock procurement is carried out locally. At the time of this

survey, none of the plants included in the sample shipped meat to the West. In cases where the slaughter volume is large, livestock are purchased in large numbers from terminal markets, some distance away from the slaughter facility in some cases. Much procurement is carried out locally, however. Consideration of information provided by meat packing plants included in the sample survey does not disclose any major factor that would limit expansion.

Kansas livestock producing units have grown sharply in size during the post war period. Production, as well as concentration, has tended to shift to the western portion of the state. Production and size of producing unit have also increased moderately in other portions of the state, but by a smaller proportion. Increases in livestock production appear to be related to increases in the production of feed grains and forages.

Continued growth in the Kansas meat packing industry will depend in large part upon the growth in demand for meat products in markets accessible to Kansas processors of meat, and the ability of Kansas livestock producers to satisfy the larger demand for livestock that will result from the increase in market demand for meat, in competition with producers in other states.

Studies carried out by the Department of Economics, Kansas State University indicate that the demand for pork should increase at least 14 percent over 1964 levels by 1975, and that demand for beef should increase 28 percent over the same period. As much of the increase in demand is expected to occur in the West and Southwest, Kansas is strategically located for supplying this market.

Calculations relating past and present livestock production in Kansas to the supply of feed grains and forages available for feeding to livestock, and on the basis of an average of feed grain surpluses produced in Kansas over the 1954-55 to 1964-65 period, it would appear that Kansas could have increased

total grain consuming livestock production by 41.1 percent. A similar calculation for forages indicates that forage consuming livestock production could have been increased by 12 percent. If all of this surplus could be fed to fattening cattle, numbers fed could have been increased by 195 percent per year in terms of grain, and 283 percent in terms of forage. Thus, on the basis of average feed supplies presently available, and not considering the possibility of expansion of feed production in the future, Kansas could not provide more than 23 percent of the increased consumption needs for beef in the entire United States by 1975.

Areas within Kansas representing the greatest potential for expansion of livestock production are measured by feed supply in 1963-64 would appear to be the North and West. Given the tendency existing at present for meat packing plants to locate close to sources of supply, and an expected strong demand for meat products resulting from expected population and income growth in the western and southwestern United States, it would appear that expansion in the meat packing industry in Kansas may tend to occur most strongly in the western areas of the state. This consideration should be tempered by the understanding that many factors vital to the location of meat packing plants have not been considered in this study, and may well limit the potential for expansion in some particular areas.

## BIBLIOGRAPHY

## Books

- American Meat Institute, By-Products of the Meat Industry, (Institute of Meat Packing, University of Chicago, Illinois, 1950)
- Hoover, E.M., The Location of Economic Activity, (McGraw-Hill Publishing Company, New York, 1948)
- Moore, John R., and Walsh, Richard G., Market Structure of the Agricultural Industries. (Iowa State University Press, Ames, Iowa, 1966.)

## Bulletins and Publications

- Allen, George, and Devers, Margaret, "Supplement for 1966 to Livestock-Feed Relationships, 1909-1965," (Economics Research Service, United States Department of Agriculture, November, 1966)
- Bender, Lloyd D., "Packer Operations and Their Influence of the State's Beef Industry," (Agricultural Experimental Station, Division of Agriculture, University of Arkansas, Fayetteville, Bulletin 645, May, 1961.)
- Cox, Rex W., and Taylor, Fred R., "Feasibility of Co-operatively Owned Slaughtering Plants," (Department of Agricultural Economics, Agricultural Experimental Station, North Dakota State University, January, 1965)
- Erickson, Don B., "Economic Considerations for Beef Processing for South Central South Dakota," (Co-operative Extension Service, South Dakota State University, Ext. Mimeo. Circ. No. 545, October, 1965)
- Kelley, P.L., McCoy, John H., and Manuel, Milton, "The Competitive Position of Kansas in Marketing Hogs," (Agricultural Experimental Station, Kansas State University, Technical Bulletin 118, October, 1961)
- Lord, Bruce P., "The Potential for Meat Packing in Northeastern Oregon," (Oregon Department of Planning and Development, October, 1961)
- McCoy, John H., Goetzinger, James, Kelley, P.L., and Manuel, Milton, "The Competitive Position of Kansas in Marketing Beef," (Kansas Agricultural Experimental Station, Kansas State University, Technical Bulletin 129, August, 1963.)
- National Commission on Food Marketing, "Organization and Competition in the Livestock Industry," Technical Bulletin No. 1, (Superintendent of Documents, United States Government Printing Office, Washington, D.C., June, 1966)
- Olson, Ross A., "A study of Structural Changes in the Livestock Economy of Kansas," (Unpublished M.S. Thesis, Department of Economics, Kansas State University, 1967)

BIBLIOGRAPHY  
CONTINUED

- Rust, Charles H., and Harston, Clive R., "The Survival and Growth Potential of Small Meatpacking Businesses in Montana," (Montana Agricultural Experimental Station, Montana State College, July, 1963)
- Taylor, Morris H., "Feasibility of Expanding Livestock Feeding and Meat Packing in Utah," (Co-operative Extension Service, Utah State University, UES-Economics-1, July, 1965)
- United States Department of Agriculture, "Livestock and Meat Statistics," (Report of the Agricultural Marketing Services, 1965 Supplement)
- United States Department of Agriculture, "Number of Meat Packing Establishments," (Agricultural Marketing Service, 1965)
- United States Department of Agriculture, "Agricultural Statistics," (Superintendent of Documents, United States Government Printing Office, Washington, D.C., 1945-1966)
- United States Department of Commerce, Bureau of the Census, "United States Census of Manufactures, Meat Products, Industry Report MC 58(2) -20A, 1947-1963, (Superintendent of Documents, United States Government Printing Office, Washington, D.C.)
- Wilson, C.P., and Riley, H.M., "Recent Trends in the Livestock and Meat Industry in Kansas," (Kansas Experimental Station, Kansas State University, 1953)

Periodicals

- Williams, Willard F., "Structural Changes in the Meat Wholesaling Industry," (Journal of Farm Economics, May, 1958) pp.315-329.

## **APPEND IX**



APPENDIX I

MEAT PACKING PLANT STUDY QUESTIONNAIRE

- (1) Slaughter capacity (no. head) 1964: cattle \_\_\_\_\_  
 calves \_\_\_\_\_ sheep and lambs \_\_\_\_\_ hogs \_\_\_\_\_
- (2) What percent of capacity does the slaughter plant operate normally? For  
 cattle \_\_\_\_\_ hogs \_\_\_\_\_ sheep and lambs \_\_\_\_\_
- (3) What is the cooler capacity for: beef \_\_\_\_\_ pork \_\_\_\_\_
- (4) Area from which livestock is obtained:

Type of livestock	Percent obtained within indicated distances				
	Less than 25 miles	25-49 miles	50-99 miles	100-149 miles	150-199 miles

Cattle

Calves

Sheep and Lambs

Hogs

- (5) What proportion of cattle and calves procurements are: cows? \_\_\_\_\_  
 steers and heifers? \_\_\_\_\_ bulls? \_\_\_\_\_ calves? \_\_\_\_\_
- (6) Data on plant operation:
- (a) Number of employees? \_\_\_\_\_
- How many of these are administrative? \_\_\_\_\_
- How many of these are production workers? \_\_\_\_\_
- Number of salesmen? \_\_\_\_\_
- Number of buyers? \_\_\_\_\_
- Total annual payroll? \_\_\_\_\_

(b) Annual costs for: (approximate)

Electricity \_\_\_\_\_  
 Water \_\_\_\_\_  
 Gas \_\_\_\_\_  
 Sewage(disposal) \_\_\_\_\_  
 Supplies (not including livestock) \_\_\_\_\_  
 Taxes on property \_\_\_\_\_

(c) How is sewage disposed of:

Use of municipal plant \_\_\_\_\_  
 Privately owned plant \_\_\_\_\_

(7) Distribution of products:

(a) What is sales set-up and outlet used for sale of:

Hides \_\_\_\_\_

Tallow \_\_\_\_\_

Inedible grease \_\_\_\_\_

Lard \_\_\_\_\_

Meat \_\_\_\_\_

What proportion of the meat is sold to chain stores \_\_\_\_\_

(b) Destination of shipments of products by state of destination, percent.

Hides \_\_\_\_\_ Tallow \_\_\_\_\_ Inedible grease \_\_\_\_\_

Lard \_\_\_\_\_ Meat \_\_\_\_\_

(8) Plant investment:

(a) Approximate total investment \$ \_\_\_\_\_

(b) Approximate total replacement cost \$ \_\_\_\_\_

(9) Has the plant ever been studied from work efficiency standpoint? \_\_\_\_\_

(10) What are the factors to be considered in selecting the place for  
 location of a packing plant? \_\_\_\_\_  
 \_\_\_\_\_

(11) Are labor unions a problem? If so, in what way? \_\_\_\_\_  
 \_\_\_\_\_

- (12) Do you have a sausage department? \_\_\_\_\_
- (13) Are your earnings calculated by department? \_\_\_\_\_ If so, list departments in order of profitability \_\_\_\_\_
- 
- (14) What proportion of cattle slaughtered are "Grain fed"? \_\_\_\_\_%
- (15) What proportion of cattle slaughtered are "non grain fed"? \_\_\_\_\_%
- (16) Meat sales
- (a) Radius of sales? \_\_\_\_\_ miles.
- (b) Percent of each type of meat going to:
- Retail groceries \_\_\_\_\_
- Restaurants \_\_\_\_\_
- Wholesalers \_\_\_\_\_
- (17) Proportion of meat sold as:
- (a) Carcass. Beef \_\_\_\_\_ Pork \_\_\_\_\_ Lamb \_\_\_\_\_
- (b) Primal cuts. Beef \_\_\_\_\_ Pork \_\_\_\_\_ Lamb \_\_\_\_\_
- (c) Retail cuts. Beef \_\_\_\_\_ Pork \_\_\_\_\_ Lamb \_\_\_\_\_
- (18) Procurement by type of market:

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Type of livestock

Terminal

Auction

Direct from farmers	
Solicited	Not solicited

percent of total

Cattle

Hogs

Sheep and lambs

## APPENDIX II

Economic Considerations for Beef Processing for  
South Central South Dakota

Donald B. Erickson\*

## SUMMARY

Number of cattle fed in the area under study was estimated to be about 60,000 in 1963 and 70,000 in 1964. This number of cattle fed in the area is sufficient to support a slaughter plant. Whether or not the animals are sold to the plant would depend on policies of the plant and manager.

There is always concern as to availability of feed to support this number of animals. In 1963 the amount of corn produced could have fed out about 415,000 head from 600 pounds to 1,000 pounds. The lowest production for the area since 1940 was in 1959. The 1959 production would have supported about 140,000 head. This is more cattle than the survey indicated were being fed in the area.

The type of plant that this area could support would slaughter from 15 to 20 head per hour with possible expansion potential. This would necessitate a local supply of 25,000 to 35,000 head annually. Some plants are designed for expansion with only additional labor, without additional equipment. The extent of expansion is limited to the cooler capacity.

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\*Assistant Professor of Economics, South Dakota State University. The author is indebted to the late Wayne Schulte, Extension Marketing Specialist, who helped initiate this study.

The capital needed for the investment in a plant to meet these local conditions is between \$300,000 and \$350,000, depending on the "extras" desired. These "extras" include type and adequacy of water and sewerage, access roads for trucks, type of building (whether or not offal will go to the basement), and any number of other factors. In addition, operating capital should be available to finance the current expenses and carcasses until they are sold. Approximately \$300,000 is needed, depending on the method of selling and length of time between purchase of live animals and sale of carcasses.

The success of any new plant depends on the management. In order to attract top management, the salary and opportunity must be commensurate with the responsibility of the position. The manager of this size of plant will have several areas of responsibility. He must supervise buyers, the kill floor and the coolers, and merchandise the product. This type of individual can be attracted if he is convinced that his economic and professional growth will reflect his level of management.

Any plant of this nature faces the problem of merchandising the product. However, there are several alternative channels that can be selected for a plant. There are meat brokers that handle accounts for small packers. The plant may want to produce for certain quality specifications of a chain store. The carcasses can be broken and primal cuts moved into the trade to institutions. A new trend is frozen primal cuts and ground meat in controlled portions. The final decision as to the best method of selling the product of the plant should be left to the manager.

## PHYSICAL PLANT REQUIREMENTS

Although the trend has been away from larger centralized plants to smaller plants operating near production areas, the plant size must be sufficient to assure an adequate volume of live animals in order to compete with other slaughter plants. Generally, large slaughtering plants are more efficient than small plants and are able to compete more effectively in selling the processed product. This should be kept in mind, especially when designing and equipping a new facility. Due to new technologies in plant layout and equipment, smaller plants in the 20-24 head per hour rate of kill can be increased by 50% without any increase in the size of killing floor. This is accomplished by use of powered on-the-rail systems, rearranging major work areas, increasing the labor force, and redistributing elements of operation among the workers.

By increasing the volume of slaughter per hour, average costs per unit decrease. Economies of size exist for a number of reasons. Labor is usually more efficient since new technologies can be employed -- such as powered on-the-rail systems, hide pullers and air skinning knives. Another reason is that fixed costs associated with the building and equipment are allocated to a larger number of units processed.

While it is seldom a problem in most areas considering new slaughtering facilities, it is possible that a plant may be built so large as to increase per unit costs. Management becomes unable to handle its phase of the operation by lack of coordination and control, thereby decreasing efficiency. Assembly and sales costs, too, may rise as new unusual markets must be entered to supply and move the increased volume of variable products associated with this volume

When the optimum size of the plant has been determined by the potential supply of live animals and the demand for the processed products, consideration must also be given to seasonal variations and operation under less than anticipated capacity. Slaughtering plants are designed and staffed to operate under a constant rate. But when the volume of animals processed is reduced because of demand conditions or because of unfavorable supply conditions, annual volume is reduced and fixed costs are spread over fewer units. Consequently, average fixed costs increase. Seasonal fluctuations of marketing cattle, while much more prevalent in some areas than others, have to a large degree leveled out in recent years. A suggested layout of a powered-on-the-rail system for slaughtering 24 cattle per hour is presented. Plants with capacities below 15-17 animals per hour show greatly increased unit costs. This 24-head-per-hour plant could be designed to allow expansion to 35 cattle per hour without any change in the amount of floor space. Rearrangement of work units, addition of more workers and increased stations would have to be provided. Other changes needed for increased kill rates would be additional cooler space, office space and other related facilities.

Cattle are the only species considered for this suggested plant because of the restrictions of selling multi-products interstate from a small plant. One suggested plant considered in this study is for slaughter-only with no provisions for additional processes such as breaking or by-products processing.

Building Costs

Total cost of building and equipment for slaughter-only is estimated to be \$291,970. (See following estimated costs.)<sup>1/</sup> Additional operating capital of approximately \$300,000 would be necessary to operate a slaughter plant of the size suggested. Annual output is estimated to be approximately 30,000 head which is about 15-17 head of cattle slaughtered per hour. Cost per head slaughtered would be \$11.01 at this volume but would increase to \$13.76 per head at 80% capacity at this rate.

The cost of electricity, water and gas was estimated in the following manner:

$$\text{Electricity} = 157184 + 15.448 \text{ (number of head)}.$$

If the number of head is equal to 30,000, this equation will yield a cost of \$15,503.10, given the following rates.

First 500 KWH at 4.5¢ each	\$	22.50
Next 1500 KWH at 3.0¢ each		45.00
Over 2000 KWH at 2.5¢ each		15,465.60
Total		\$15,503.10

The cost of water will vary depending on source but should be from 500-800 gallons per head. An allowable figure would be \$3,500.00. The cost of gas or L.P. gas will also vary. An average requirement for the above example would be 222,600 cubic feet, which for estimating purposes would be \$5,000 annually.

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<sup>1/</sup> Samuel H. Logan and Gordon A. King, "Economies of Scale in Beef Slaughter Plants", Giannini Foundation Research Report No. 260, University of California, December 1962.



Table 8. Estimates Costs for an Average On-the-Rail System Based on 24 Head Per Hour. 1/

	<u>Building Requirements and Costs</u>		
	<u>Building Cost sq. ft.</u>	<u>Floor Area</u>	<u>Total Cost</u>
Kill floor	\$18.00	2520	\$ 45,360
Chill & offal cooler	15.00	1513	22,695
Sales cooler	15.00	2200	33,000
Office	10.00	1150	11,500
Employee Dressing	10.00	450	4,500
Equipment cleaning	10.00	220	2,200
Refrigeration	10.00	240	2,400
Boiler	10.00	200	2,000
Dry storage	10.00	150	1,500
Basement	10.00	600	6,000
Dock	12.00	430	5,160
Dock Apron	3.00	860	2,580
Ramp	3.00	900	2,700
	<b>TOTAL BUILDING COST</b>		<b>\$141,595</b>

**Cost of Corrals and Corral Fencing**

<b>Holding Pens 20' x 10'</b>	<b>Area in Pens</b>	<b>Area in Alleys</b>	<b>Cost of Floors and Fencing</b>
35	7,000	2,300	\$13,300

1/ Logan, Ibid

Table 9. Annual Fixed Costs of Buildings and Equipment 1/

<u>Cost of Equipment</u>	<u>Salvage value <u>a/</u></u>	<u>Balance for Depreciation</u>	<u>Total Depreciation per year <u>b/</u></u>
\$130,000	\$9,100	\$120,900	\$10,075

a/ 7 percent of costb/ 12 year average liveBuilding Costs and Annual Depreciation

<u>Building, Corral and architectural costs</u>	<u>Depreciation per year <u>a/</u></u>
\$161,970	\$8,099

a/ total cost divided by 20 yearsAnnual Interest and Insurance Costs

<u>Investment in Bldg. and Equipment</u>	<u>Interest charges <u>a/</u></u>	<u>Insurance costs <u>b/</u></u>	<u>Total Interest &amp; Insurance</u>
\$291,970	\$8,759.10	\$1,459.85	\$10,218.95

1/ Logan, Ibida/ three percent of column 1b/ \$ .50 per hundred

Table 10. Miscellaneous Costs Associated With Slaughter Process 1/

<u>Repair and Maintenance</u>	<u>Killing Costs <u>a</u>/</u>	<u>Office Costs <u>b</u>/</u>	<u>Taxes and Licenses <u>c</u>/</u>	<u>Telephone Costs</u>
\$10,849	\$10,659	\$5,130	\$11,654	\$9,736

<u>Delivers Costs <u>d</u>/</u>	<u>Feed and Corral Costs</u>	<u>Buying Costs <u>e</u>/</u>	<u>Legal and Auditing</u>	<u>Interest on Oper. Cap. <u>f</u>/</u>	<u>Total</u>
\$14,818	\$3,200	\$1,600	\$1,500	\$21,000	\$90,146

a/ Includes shrouds, shroud pins, ink, towels, etc.

b/ Includes dues, subscriptions, postage, office machine service, etc.

c/ Includes non-personal property taxes as payroll taxes and operating licenses.

d/ Shipping supplies as twine, paper, ink, tags, etc.

e/ Buying costs based on area buying.

f/ Based on 12 day accounts receivable collection at 6%.

Table 11. Estimated Short-Run Costs for Suggested Plant

<u>Annual Output</u>	<u>Annual Fixed cost <u>a</u>/</u>	<u>Annual Labor cost <u>b</u>/</u>	<u>Annual Misc. cost <u>c</u>/</u>	<u>Annual total cost</u>	<u>Cost per head</u>
30,000	\$112,173.65	\$127,905.60	\$90,146.00	\$330,225.25	\$11.01
27,000					12.23
24,000					13.76

1/ Logan, Ibid

a/ Includes depreciation, insurance, taxes, interest, salaried labor and cost of utilities.

b/ Includes production worker labor costs

c/ Includes various miscellaneous costs such as office supplies, telephone charges, killing floor costs, feed for livestock, taxes, licenses, etc.

Table 12. Average Production Labor Costs 1/

	<u>Average Cost Per Man</u>	<u>Total Cost</u>
<b>Kill Floor Workers - (13)</b>		
Floor workers @ \$2.50	\$5040.00	
Vacation pay (1 wk)	100.00	
Sick leave (1 wk)	100.00	
Fringe benefits	<u>454.80</u>	
Total	\$5694.80	
13 workers		\$ 74,032.40
<b>Maintenance Men - (2)</b>		
1 Foreman @ \$3.00	\$6048.00	
Vacation pay	120.00	
Sick leave	120.00	
Fringe benefits	<u>454.80</u>	
	\$6742.80	\$ 6,742.80
1 Operator @ \$2.75	\$5544.00	
Vacation pay	110.00	
Sick leave	110.00	
Fringe benefits	<u>454.80</u>	
	\$6218.80	\$ 6,218.80
<b>Cooler Workers and Dock Men - (5)</b>		
Cooler men @ \$2.75 plus benefits	\$6218.80	
4 Cooler workers		\$ 24,875.20
1 Dock foreman @ \$3.00 and benefits	\$6742.80	\$ 6,743.80
<b>Yardman - (1)</b>		
Yardman @ \$2.00	\$4032.00	
Vacation pay	80.00	
Sick leave	80.00	
Fringe benefits	<u>454.80</u>	
	\$4646.80	\$ 4,646.80
<b>Clean-Up Personnel - (1)</b>		
Clean-up man @ \$2.00 plus fringe benefits	\$4646.80	<u>\$ 4,646.80</u>
<b>TOTAL ANNUAL COST</b>		<b>\$127,905.60</b>

Table 12. (Continued)

## (Salaried Personnel)

Office - (3)		
1 Payroll, accounts payable	@ \$	4,950
1 Phone, billing, posting	@	4,200
1 General Ledger, credit, accts. payable	@	6,800
Total Office clerical		\$ 15,950
Buying and Selling - (3)		
1 Buyer	@ \$	9,600
2 Sellers	@	9,600
Total Buying and Selling		\$ 28,800
Management - (1)		
1 General Manager	@ \$	15,000
		<u>\$ 15,000</u>
TOTAL ANNUAL COST		\$ 59,750

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1/ Logan, Ibid.

Further indication of economies of scale for on-the-rail plants are:<sup>1/</sup>

Kill rate per hour	Average cost/head
20	\$9.74
40	8.96
60	8.45
75	7.75
120	7.28

1/ Logan, Ibid p. 102.

Another type of available plant is the new over-head rail system. Instead of having all the rails and other equipment suspended from the ceiling, a large central support with a large wheel assembly is used to conduct the carcasses through the various operations. The animals (hogs, cattle or sheep) are bled and moved from a conventional straight rail to the large circular rail (rotary dressing system) where the hide is dropped, the viscera removed and carcass

split as the carcass is moved around. The Federal Inspector is able to operate more efficiently because his duties can be performed faster. The viscera are put into a truck and the carcass is split in the same vicinity. The head of the animal is moved to the inspector simultaneously. He can inspect the entire animal with a minimum of movement. The "rotary dressing system" also saves in building costs because the structure need not support the equipment from the ceiling.

Table 13 shows a comparison of the estimated annual costs of operating a rotary system as compared to the on-the-rail system.

Table 13. Estimated Operation Costs of Rotary System With a Typical Plant at the Rate of 35 Head Per Hour.

		Typical Costs <sup>a</sup> 35 hd/hr.		Rotary, Costs <sup>b</sup> 35 hd/hr.
<b>Labor:</b>				
Kill crew	28	\$153,621	20	\$108,000
Cooler & dock	9	45,000	6	30,000
Maintenance	4	20,000	2	10,000
Clean up and yard	4	20,000	2	10,000
Office	4	20,000	4	20,000
Buyers	2	25,000	2	25,000
Sellers	2	24,000	1	12,000
Management	3	45,616	2	36,000
		<u>\$353,237</u>		<u>\$251,000</u>
Including Employment Benefits 8.4%		<u>29,660</u>		<u>19,000</u>
		<u>\$382,897</u>		<u>\$270,000</u>
<b>Investment:</b>				
Interest		\$ 11,574		\$ 18,000
Insurance		1,772		1,772
Taxes		5,532		5,532
Depreciation		<u>19,548</u>		<u>43,000</u>
		<u>\$ 38,426</u>		<u>\$ 68,304</u>
<b>Utilities:</b>				
Electrical		\$ 16,852		\$ 15,000
Water		3,258		3,000
Gas		<u>1,983</u>		<u>2,000</u>
		<u>\$ 22,093</u>		<u>\$ 20,000</u>

Table 13. (Continued)

Miscellaneous:		
Repair	\$ 22,382	\$ 13,000
Killing Supplies	14,537	14,537
Office Supplies	6,797	6,797
Taxes and licenses	21,826	21,826
Telephone	18,887	18,887
Delivery	22,030	22,030
Feed, Corral	6,602	6,602
Buying	<u>3,301</u>	<u>3,301</u>
Cost	\$116,362	\$106,980
Total Cost	\$559,778	\$465,284
Total No. Cattle	66,024	66,024
Cost/head	\$8.48	\$7.05

<sup>a</sup> Logan, Op Cit

<sup>b</sup> Figures obtained with special permission from John Hagger Beef Plant Survey Nemo -- Packing house designers, Northfield, Minnesota

The use of new type air knives and a new type of hide puller allows about 60% to 70% of the hide to be pulled. The skilled use of air knives can be accomplished with minimum training.

The building and equipment cost of the rotary plants is about \$300,000 to \$320,000 as compared to \$379,783 for the typical plant.<sup>1/</sup> The cost of corrals, land and other facilities would remain the same regardless of which type of plant was installed.

The coolers must be large enough to handle any proposed immediate expansion of slaughter. With this type of equipment the coolers should be able to handle from 15 to 35 head per hour. Capacity of the coolers is a major factor limiting expansion of a plant. Extra cooler space at the time of building costs only a fraction of the cost of adding it later.

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<sup>1/</sup> Logan, Op. Cit.

## Portion Control

The process of portion control in the plant is an additional source of income. The more services performed at the local level the greater will be the income to the community. Thus, if the meat from the cows and plates (fat, brisket and ribs of fat animals) is boned and processed into a frozen patty, savings on freight and brokerage will be accrued to the local plant. The capital investment of additional equipment, building space and refrigeration is given in Table 14. The total additional investment would be approximately \$138,100 for a portion control unit of 2000 pounds per hour or approximately 4,000,000 pounds per year.

The return to this type of operation can be illustrated a couple of ways. To obtain one type of a mixture of approximately 85% lean and 15% fat content for one type of patty. One example of figuring costs can be obtained by assuming the meat is purchased in the following proportions:

20 pounds frozen navels  
40 pounds frozen whole cow carcass meat  
40 pounds fresh whole cow carcass meat

Using the "yellow sheet" cost for each (\$21.00, \$41.00 and \$41.00 per hundred respectively) of these types of meat the total cost of the product is \$37.00 per hundred weight.

Another method is to use a 700 lb. cow with a 45% kill yield, then a 72% boning yield. The cut out of salable meat is 227 pounds.



Table 14. Investment requirements of additional equipment for a portion control unit added to a slaughter plant.<sup>a/</sup>

	Price Installed	
<b>Patty operation:</b>		
Building 60 x 100, including freezers	\$50,000	
Refrigeration equipment		
Blast freezer \$1000/ton (depending on dwell time)	\$7,500 - 15,000	
Storage freezer	<u>7,500</u>	
Total		\$ 72,500
<b>Machinery:</b>		
Frozen meat flaker	\$ 6,000	
5 conveyor belts or screws	10,000	
Meat grinder	3,200	
Patty former	1,200	
Continuous freezing belt (blast freezer) (batch pack - alternate system) - \$500	12,000	
Packaging machinery	3,500	
Cartoning machinery	2,800	
Scales	<u>3,000</u>	
Total machinery cost		\$ 41,700
<b>Boning operation:</b>		
Meat rails	\$ 3,500	
Boning tables with stainless steel conveyor	3,500	
Rotary sorting table	4,000	
Saws	2,500	
Bone conveyor	2,000	
Cartoning	1,200	
Work room cooling \$550/ton installed	4,400	
Miscellaneous	3,000	
Building \$7.00 per square ft. 40' x 60'	16,800	
Beef cooler-refrigeration \$550/ton installed	<u>5,500</u>	
Total boning investment		<u>\$ 46,400</u>
Total Investment		\$160,600

<sup>a/</sup> Based on estimates at 2000 pounds per hour output by the Northfield Manufacturing Equipment Company, Northfield, Minnesota.

Thus.	700 lbs. cow @ \$12.00 cwt. <sup>1/</sup>		\$84.00/hd.
	Kill cost		6.40
	Variety meats @ \$1.37/hd.	\$1.37	
	Hide 50 lbs. @ 10¢ \$5.00/hd.	<u>5.00</u>	
	(Rendering shipped out at cost.)		
	Cost of meat (without boning cost)		<u>\$84.03</u>
	227 lbs @ \$84.03 meat cost.		\$37.02/cwt.

Based on a plant of 4,000,000 pounds per year a portion control operation would be:

Cost of meat	\$ .3702
Cost of operation	.1320
Freight @ \$1.50 cwt.	.0150
Brokerage	<u>.0230</u>
Average cost	\$ .5402

<sup>1/</sup> The \$12.00 cwt for cows was during the same time period as the meat prices to be able to compare the two different methods.

Average selling price	\$ .564 <sup>1/</sup>	
Sales 4,000,000 pounds @	.564	= \$2,256,000
Cost 4,000,000 pounds @	.5402	= <u>2,160,800</u>
Profit		\$ 95,200

There are also economies of scale for an operation of this type. In other words, the larger operation has lower costs of operation per pound of meat processed. Table 15 shows a comparison between the costs and profit between various sizes of operation.

<sup>1/</sup> Weighted average price of all types of portion control market prices.

Profit is largely dependent on the yield of the live animal and the meat yield of the carcass. Fixed costs such as the building, equipment, and management will decrease on a per unit basis as the poundage moved through the plant increases.

The direction and type of operation that any plant can take is dependent on the capability of the management. Most plants can survive with the proper management and capital requirements.

Table 15. Comparison of Costs of Various Sizes of Portion Control Operations.

	- - - - Pounds/Year - - - -			
	<u>2,000,000</u>	<u>3,000,000</u>	<u>4,000,000</u>	<u>7,500,000</u>
Wages & Salaries	\$131,500	\$148,000	\$186,000	\$214,000
Utilities	30,000	37,000	49,000	50,000
Cartons & Packages	100,000	150,000	200,000	375,000
Depreciation	40,000	40,000	40,000	40,000
Interest & Insurance	16,000	16,000	16,000	16,000
Repairs	6,600	10,000	14,000	20,000
Management & Sales	<u>20,000</u>	<u>25,000</u>	<u>25,000</u>	<u>50,000</u>
Total Operating Costs	<u>\$344,100</u>	<u>\$426,000</u>	<u>\$530,000</u>	<u>\$765,000</u>
Cost per pound	\$.172	\$.142	\$.132	\$.102
Cost of Meat	.370	.370	.370	.370
Cost of Operation	.172	.142	.132	.102
Freight	.015	.015	.015	.015
Brokerage	<u>.023</u>	<u>.023</u>	<u>.023</u>	<u>.023</u>
	\$.580	\$.550	\$.540	\$.510
Sales - @ .564	\$1,128,000	\$1,692,000	\$2,256,000	\$4,230,000
Cost of sales	<u>1,160,000</u>	<u>1,650,000</u>	<u>2,160,000</u>	<u>3,825,000</u>
Profit	- \$32,000	\$42,000	\$96,000*	\$405,000

\*This is slightly different due to rounding errors.

### Capital Requirements

The amount of capital required for plant and equipment varies with the species of animal, slaughter volume and the amount of processing completed. Minimum capital requirements are needed for slaughtering with additional capital required for processing inedible products, hide curing, and other processes.

Total capital needs vary according to the size of plant but should require about 50% for the facility and 50% for operating capital. Operating capital is based on accounts receivable running approximately two weeks.

Financing a slaughter plant usually requires larger amounts of capital than community banks can lend to a single borrower. Banks are more likely to lend money for plant operations with accounts receivable as collateral.

Funds for fixed capital requirements may be raised locally or it may be advisable to seek outside investment counsel from a professional firm in regard to selling stock to the public. The percentage of total capital requirement to be secured by sale of stock is a management decision.

Another source of financing is through equipment dealers. Companies that provide equipment for slaughter plants are highly specialized and some are willing to consider financing part of the machinery and equipment needs.

Regardless of what type of lending institution is finally accepted, it will require budgeted analysis of operating statements for several years in the future. These budgets should show such things as at what rate of capacity the plant expects to operate, how it expects to pay off its loan, how much it expects to make, and related information.

The problem of shortening the time between beginning construction of the facility and starting actual operations must be considered. The time from start to finish in construction of a slaughter plant may vary from a few to several months. Once construction has been completed, additional consideration must be given to time between start of operation until first sales. Then additional time must be allowed from first sales to first receipts. The approximate number of animals to be purchased between start of operations and when first receipts are obtained can help to determine the amount of operating capital required. If accounts receivable for beef carcasses run longer than two weeks, an increase of approximately 25% to 35% in operating capital should be allowed. If less than two weeks, operating capital needs might be cut by as much as 50%. For other species of animals such as hogs and sheep, less operating capital is generally required, but in all cases the price level of live animals will be a significant factor.

## Operational Requirements

Although the personnel needs of most decentralized slaughtering plants are relatively small, lack of competent, well-trained, experienced employees can often be the weak link that breaks an otherwise strong chain. This is especially true in terms of the management personnel required. When only a few people are at the management level, it often requires that versatility be one of the essential qualities. However, in order to be successful, versatility must be combined with ambition, technical knowledge, keen judgment and analytical skills.

Because of the multiplicity of duties of a manager in a smaller plant, another member of the management staff should be available for second line management duties and to assume full responsibility if necessary. Unless the structure of the organization is a single proprietorship, it is well to have a competent board of directors to determine policy and to contribute to depth of management. An active, well-informed board can take over management decisions in the event of the manager's death or loss and for other reasons.

The beginning firm has the choice between hiring a proven manager or one without previous packing plant experience. When a firm retains the services of a highly qualified manager, it obtains not only the personal abilities of the man, but his contacts with other firms and the industry. Thus the salary should be commensurate with his ability. Proven managers know the "tricks of the trade" with respect to supply requirements, equipment suppliers, market requirements and market outlets. Through the employment of trained and experienced management personnel, many problems which arise from inexperience and lack of technical and managerial knowledge can be avoided. Trained,

experienced, high quality management is one of the least expensive major inputs required for successful operation of a new plant,

As the firm becomes established, management advancement can be facilitated by the use of training programs. The organizational structure of the business should allow individuals with initiative and talent to progress to more responsible jobs. A job description for each employee often aids in preventing unnecessary problems. Poor communication between management and employees can lower morale and reduce workers' effectiveness because of lack of understanding job duties.

In some areas skilled operators may be available. However, in most areas new employees with rural backgrounds can be easily trained. Qualified and experienced individuals, however, should be employed for key positions as a minimum until the plant is functioning smoothly.

The utilization of by-products by a slaughter plant is important in determining its efficiency. The price that a plant can pay for a meat animal is determined by the wholesale value of the dressed carcass, while the combined value of the by-products usually covers the meat packer's processing costs. Slaughter plants that are able to cover their processing costs with returns from by-products are in a stronger position to pay the producer more for the live animal. In some instances, cooperative ventures do the slaughtering for the value of the by-products or on a cost plus basis and return the carcass value to the producer or feeder. This method reduces risk to the slaughter plant due to price changes.

Present and future prospects are that synthetic substitutes for animal by-products will reduce the value of by-products recovered by meat packers.

Therefore, their value may not continue to pay processing expenses. This means that the spread between livestock costs and meat prices may widen. Both meat consumers and livestock producers would be the ultimate losers if this should occur.

### PRODUCT MERCHANDISING

Because of the limited opportunity to sell additional quantities of meat within states that produce meat animals, federal inspection becomes an important consideration. A new plant would depend almost entirely upon out-of-state demand for its meat and by-products. Breaking into a market outlet requires not only meeting federal requirements of slaughtering but often of grading standards as well. Some of the larger packers use their own brand names although this may not be practical for the small slaughter plant. Federal grading provides specifications for quality of the meat and many retail stores rely on this criterion for quality control in purchasing carcass meat.

Cooperation of feeders may be encouraged to produce uniform quality animals. This may require buying live animals on a grade and yield basis. Feeders should take greater interest in the carcass quality rather than rely on just outward appearances. The more uniform the carcasses the easier it is to establish a reputation. Various grades usually have to be marketed in different channels resulting in a greater marketing cost. Thus, the larger number of different grades slaughtered the greater the marketing costs. This ultimately results in lower returns to producers.

The possibility of a new plant selling most of its product to chain stores will depend upon volume it can supply to meet rigid chain store quality specifications. If a plant can produce a product that meets the chain store's requirements in type and quantity, it puts itself in a strong sales position. Meat buyers for chains usually seek the best buy at the most competitive price, negotiating by telephone instead of individual selection. Many retail brokers also negotiate by telephone instead of individual selection with packers and suppliers. With this type of market structure, meat packers with federal-grading have a greater opportunity to compete with firms that are nearer the procurement office.

Another method of merchandising the carcasses is to sell primal cuts and portion control frozen ground beef. Portion control is becoming more popular as a result of the increasing demand of the institutional trade because of the uniformity of the product. Housewives are also beginning to be aware of the uniformity of portion control meat patties. These frozen products by-pass the normal meat channels. Frozen food brokers handle the product, spoilage is minimal, and shelf life is extended to about 6 months. The primal cuts from the carcasses can be sold to the institutional trade. This channel or method of merchandising is increasing and would be successful if a quality program were stressed. The high quality that can be associated with a brand name or contract brand name could develop into a good market outlet. Additional equipment would be necessary for this operation. But it seems to be a profitable venture in view of an expanding market for frozen foods because of less spoilage and increasing emphasis on uniform quality.



Another potential outlet would be to enter into an agreement with another plant which has a portion control operation. This would mean a consistent outlet for the lower grades of carcasses and the trimmings from the primal cuts.

A final factor to consider is the relationship of transportation costs of live animals and dressed meat. Many areas do not have adequate rail facilities to service the frequency of shipments required by a slaughtering plant. The use of trailers-on-flat-cars has possibilities where loading and unloading facilities are not too distant. The use of "piggy-back" facilities have certain advantages such as being able to transport meat to areas not having rail dockage facilities. For direct point-to-point shipments, less time is lost in switching at terminals.

Transportation rates by truck depend upon leasing agreements by independent trucking firms. In areas where there are no plants, a rate structure would need to be established. A great amount of variation could exist until trucking firms established rates based on their ability to compete with one another.

DEVELOPMENTS IN THE KANSAS LIVESTOCK AND MEATPACKING  
INDUSTRIES

by

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B.S.A., (Honors), University of Toronto, 1962

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AN ABSTRACT OF A MASTER'S REPORT

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KANSAS STATE UNIVERSITY  
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## DEVELOPMENTS IN THE KANSAS LIVESTOCK AND MEATPACKING INDUSTRIES

Kansas is an increasingly important contributor to the nation's livestock industry. Over the 1945 to 1964 period, livestock production in Kansas has increased not only in absolute terms, but also in relation to its neighboring states and the United States as a whole. As such, it has provided an increasingly greater share of Kansas farm cash income. This is not as true for the Kansas meat packing industry, however. For, while still remaining an important element in manufacturing in Kansas, it has declined in relative position over the post war period.

There are indications that this may not continue to be the case. Technological changes in meat packing, coupled with changes in the freight rate structure, making the shipment of meat less costly than the shipment of live animals, have tended to shift slaughter volume to more efficient plants closer to supply areas. These plants could well locate in Kansas.

A sample survey conducted among medium and large sized meat packing plants in Kansas indicates that the Kansas meat packing industry is operating at moderately full capacity. While some of the meat processed in these plants is shipped on a regular basis to the eastern United States, most of the livestock procurement is carried out locally. Consideration of the plants included in this sample does not disclose any major factors tending to limit the expansion of these meat packing plants.

Kansas livestock producing units have grown sharply in size during the post war period. Producing, as well as concentration, has tended to shift to the western portion of the state. Production and concentration has also

increased moderately in other portions of the state, but by a smaller amount. Increases in livestock production appear to be related to increases in production of feed grains and forages.

Continued growth in the Kansas meat packing industry will depend in large part on the growth in demand for meat in markets accessible to Kansas meat processors, and on the ability of Kansas livestock producers to increase production in competition with producers in other states.

Studies carried out by the Department of Economics, Kansas State University, indicate that demand for pork should increase by 28 percent over 1964 levels by 1975, and that demand for beef should increase by 28 percent over the same period. As much of the increase in demand is expected to occur in the West and Southwest, Kansas is strategically located for supplying this market.

On the basis of an average of feed grain surpluses produced in Kansas over the 1954-55 to 1964-65 period, it appears that total grain consuming livestock production could have been 41.1 percent higher over this period, and that forage consuming livestock production could have been increased by 12 percent. If all of this surplus had been fed to cattle, numbers fed could have been increased by 195 percent per year in terms of grain, and 283 percent in terms of forage. Thus, just on the basis of past and present feed supplies, Kansas could now provide 23 percent of the increased consumption needs for beef for the entire United States to 1975.

Areas within Kansas representing the greatest potential for expansion in livestock production as measured by feed supply in 1963-64 would appear to be the northern and western portions of the state. It would thus appear that expansion in the meat packing industry in Kansas should tend to occur most strongly in these areas.