A STUDY OF STRUCTURAL CHANGES IN THE LIVESTOCK ECONOMY OF KANSAS

by

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B.S., Kansas State University, 1965

A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Economics

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1967

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ACKNOWLEDGMENTS

The author wishes to express his sincere appreciation to Dr. John H. McCoy, Professor of Agricultural Economics, Kansas State University for the guidance and assistance he gave in the preparation of this thesis and also to Dr. Frank Orazem, Professor of Economics, for his helpful suggestions. Gratitude is likewise expressed to the personnel of the Kansas Crop and Livestock Reporting Service for the valuable time and service, in terms of suggestions and useful information, which they provided the author.

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CHAPTER I

INTRODUCTION

Livestock production constitutes an important facet in the agriculture of Kansas. Figure 1 portrays the importance of livestock and livestock products to Kansas farmers in terms of cash receipts. The structure of the livestock economy in Kansas is changing. Tables 2 and 3 give perspective to the changing position of Kansas, relative to other states, in the feeding of cattle, while Fig. 2 denotes the trend toward increased numbers of cattle in the United States and in Kansas. Accompanying this picture, as is presented in Table 1 and Fig. 3, is the trend toward fewer and larger farms within the state of Kansas.

Table 1. NUMBER AND AVERAGE SIZE OF FARMS IN KANSAS, 1920-1964

Year	Average Size of Farms (acres)	Number of Farms
1920	275	165,286
1925	264	165,879
1930	283	166,042
1935	275	174,589
1940	308	156,327
1945	344	141,192
1950	370	131,394
1955	416	120,167
1960	481	104,347
(a) 1964	540	92,479

Source: Bureau of Census. United States Census of Agriculture: 1959, Kansas Counties, Vol. I, State Table 1, p. 3.

(a) Preliminary

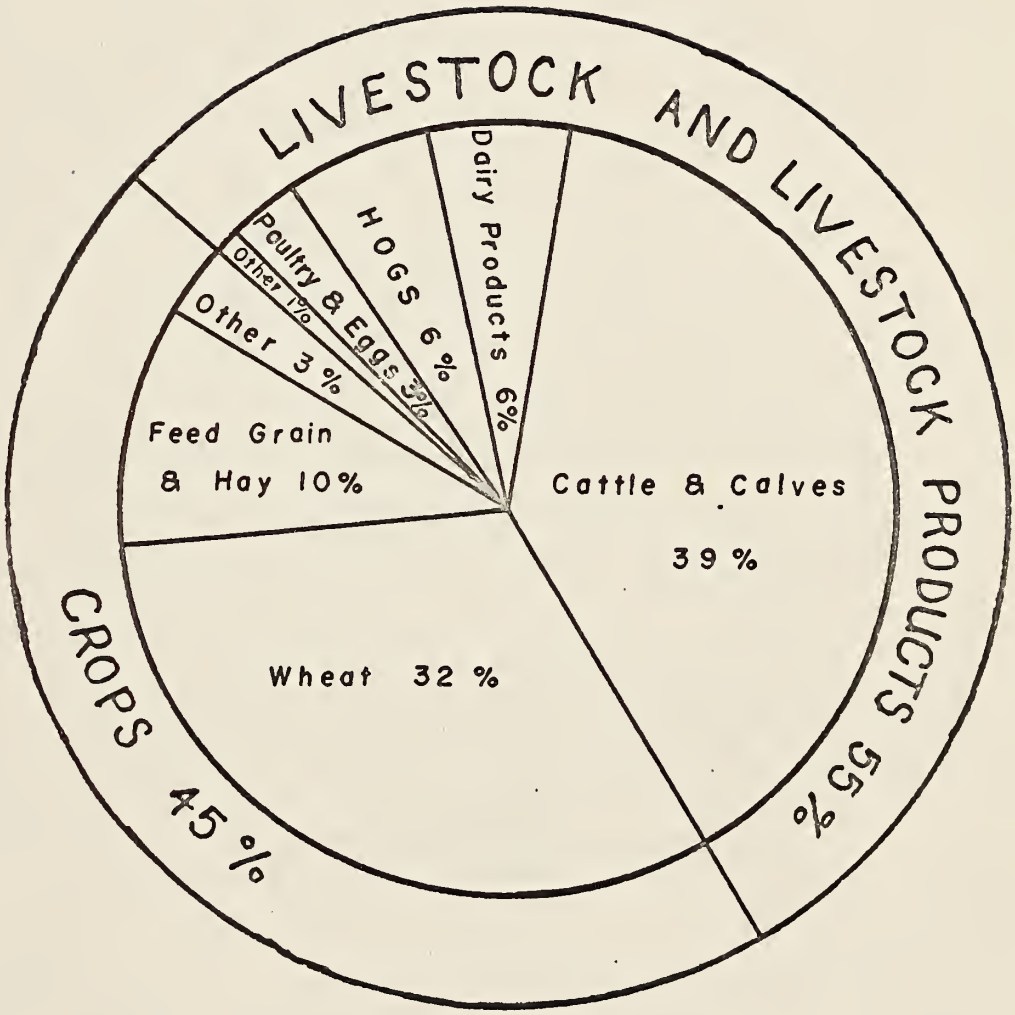


Fig. 1. SOURCES OF CASH RECEIPTS FROM FARM MARKETINGS, KANSAS.

Source: Page 85F Kansas State Board of Agriculture. "Farm Facts 1965*1966".

Table 2. CATTLE AND CALVES: NUMBER (IN THOUSANDS) ON FEED BY TEN LEADING STATES January 1, AVERAGE FOR 1940-49, 1950-59 AND ANNUAL 1960, 1963, 1965 [a]

	Average 1940-49		Average 1950-59		1960		1963		1965 [c]	
	NUMBER	RANK	NUMBER	RANK	NUMBER	RANK	NUMBER	RANK	NUMBER	RANK
Iowa	925	1	1173	1	1510	1	1697	1	1748	1
Nebraska	361	3	568	3	665	3	844	3	1027	2
California	166	8	391	4	665	4	1000	2	915	3
Illinois	482	2	589	2	688	2	787	4	659	4
Colorado	161	9	279	6	404	6	525	5	534	5
Minnesota	280	5	333	5	416	5	497	6	506	6
Texas	147	11	160	12	248	10	450	7	488	7
Kansas	254	6	220	9	275	7	392	8	407	8
South Dakota	148	10	217	10	247	11	332	10	349	9
Arizona	56	19 [b]	146	13	265	9	377	9	348	10

a Estimates include cattle being fattened for market as a more or less distinct agricultural enterprise, and excludes small operations incidental to dairy and general farming. Cattle thus fed are presumed to produce carcassas that will grade good or better.

b For the average 1940-49, Missouri ranked 4th with 289,000 head but dropped to 7th with 244,000 head, and 8th with 270,000 head in the average 1950-59 and the year 1960 respectively. In 1963 and 1965 Missouri fell below the top ten.

For the average 1940-49 Indiana ranked 7th with 170,000 head. In the average 1950-59 it dropped to 8th with 224,000 head and in the years 1960, 1963, 1965 fell below the top ten.

c Preliminary

Source: United States Department of Agriculture, Agriculture Statistics, 1951, Table 421; 1961, Table 462; 1964, Table 455; 1965, Table 458.

Table 3. CATTLE AND CALVES: NUMBER (IN THOUSANDS) ON FEED, KANSAS AND UNITED STATES, January 1, AVERAGE FOR SELECTED PERIODS AND ANNUAL, 1931-66 [a]

Period	Kansas	United States[b]	Kansas As Percent Of United States
1931-35	232	2,818	8.2
1936-40	149	3,247	4.6
1941-45	277	4,224	6.6
1946-50	252	4,257	5.9
1951	252	4,534	5.6
1952	265	4,961	5.3
1953	270	5,762	4.7
1954	216	5,370	4.0
1955	227	5,795	3.9
1956	182	5,880	3.1
1957	153	6,067	2.5
1958	171	5,830	2.9
1959	229	6,627	3.5
1960	275	7,173	3.8
1961	337	7,645	4.4
1962	347	7,929	4.4
1963	392	8,932	4.4
1964	388	9,065	4.3
1965	407	9,125	4.5
1966	456[c]		

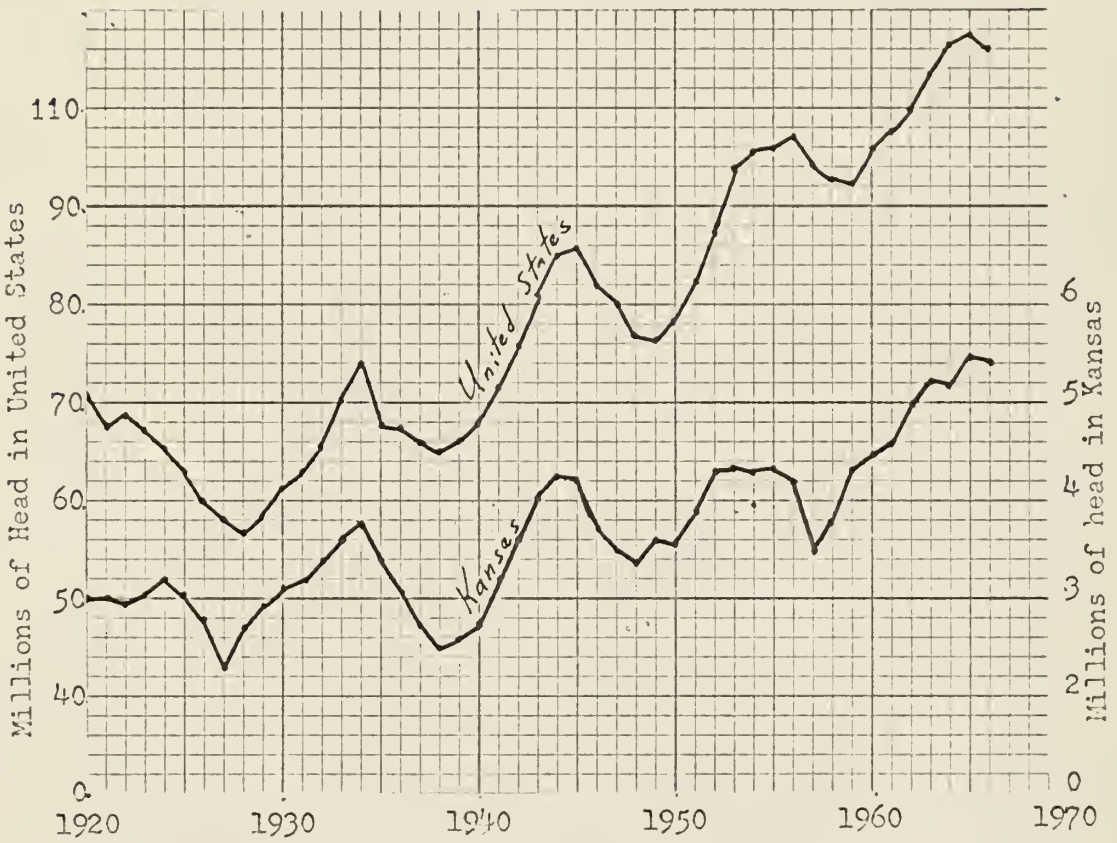
a Estimates include cattle being fattened for market as a more or less distinct agriculture enterprise, and excludes small operations incidental to dairy and general farming. Cattle thus fed are presumed to produce carcasses that will grade good or better.

b Includes only the 26 leading cattle states.

c Preliminary

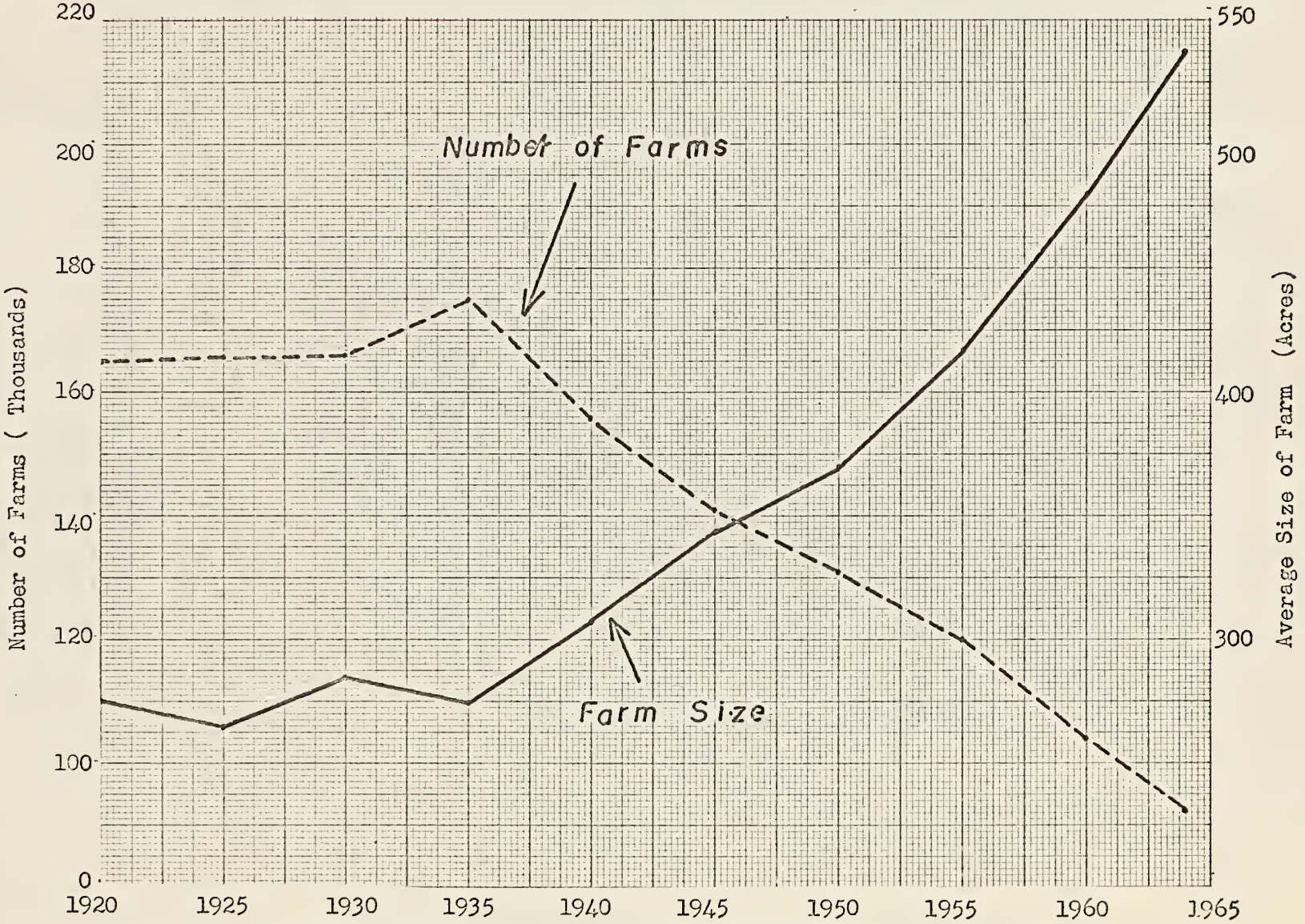
Source: United States Department of Agriculture, "Agricultural Statistics," 1931-1965.

Fig. 2. NUMBERS OF ALL CATTLE AND CALVES ON UNITED STATES AND ON KANSAS FARMS JANUARY 1, 1920-1966.



Source: Kansas State Board of Agriculture, "Kansas Agriculture", 1963-64, p. 139-140. United Stated Department of Agriculture, "Agricultural Statistics",1962, Table 455, 1965, Table 453.

Fig. 3. NUMBER AND AVERAGE SIZE OF FARMS IN KANSAS, 1920-1964.



Source: Bureau of Census, "United States Census of Agriculture" 1959, Kansas Counties. Vol. I, State Table 1, p.3. (a) Preliminary

CHAPTER II

OBJECTIVE OF THE STUDY

The objective of this study[1] was to identify the pattern of change in the structure of livestock production in Kansas. More specifically this study was designed to identify the pattern of change in size, number, and location of livestock producing units in Kansas for three various types of livestock since 1940: grainfed cattle, grassfed cattle, and hogs. In economics terminology this is concerned with measuring changes that have occurred in the degree of concentration in livestock production. To do this it was necessary that the state be divided into subareas. Ideally each subarea would consist of counties that were homogeneous in terms of the type of livestock produced. Meaningful size categories of livestock producing units were to be established and the percent of producing units and volume of each size category was to be obtained for each subarea. This would indicate importance of the size categories. The change in subarea importance in each size category of producing units and volume produced would be determined to indicate directional change in concentration within the state.

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[1] This study was sponsored under Project Number H(707)RRF through the North-Central Regional NCM-36 Project Committee.

A complete analysis of the structural changes[2/] occurring in livestock production would involve a study of those characteristics of organization of the livestock economy related to market structure, conduct and performance. A major structural variable usually measured in such a study is degree of concentration. Other variables include barriers to entry of firms, the extent of vertical integration and product differentiation. Conduct refers to patterns of behavior that firms follow. Some variables measured would include the methods employed by firms in determining level of output, their response to price change, and their policies concerning purchases and sales. Performance refers to the important economic results of structure and conduct patterns. Performance variables measured include the relative efficiency of procurement, plant utilization, scale and distribution, the level of profits, and policy. Policy is here related to important public and private remedial programs, such as antitrust laws relative to mergers, standards and corporations, and price support programs.

2/ Stephen H. Sosnick. "A Critique of Concepts of Workable Competition," Quarterly Journal of Economics (August, 1958), pp. 380-423. Robert L. Clodius and Willard F. Mueller. "Market Structure Analysis as an Orientation for Research in Agricultural Economics." Journal of Farm Economics (August, 1961), pp. 513-53. John R. Moore and Richard G. Walsh. Market Structure of the Agricultural Industries (Iowa State University Press, 1966).

CHAPTER III

SCOPE AND PROCEDURE

Source of Data

Three primary sources were available which provided data that might be useful for achieving the objectives outlined for this study. Several available sources were Farm Management Association records, United States Census of Agriculture, and data collected by county assessors and analyzed by the Kansas Crop and Livestock Reporting Service.

Data collected by county assessors were employed in this study. Census of Agriculture records, published every five years, presented a disadvantage in that the latest data available was for the year 1960. Information for 1965 had not been released when this study was begun. Also the form in which the census data was published would not allow a study of the change in size categories of the producing units, over the past years. Thus data from the Census of Agriculture reports were employed only as a means of checking findings in this study.

Farm management records were also considered as a possible source of data. However, the farms represented by the Farm Management Association typically are not the exceptionally small scale farmers nor the large commercial farms. Therefore it was felt that this bias would not allow the overall picture to be

observed. Also, determination of the subareas was influenced by the decision to use data from the Statistical Reporting Service rather than from the Farm Management records.

County assessor's records and data from the Statistical Reporting Service were utilized for several reasons. The raw data, information on every farm in the state, was available directly from the county assessor's records, which were filed with the Kansas State Historical Society in Topeka, Kansas. Having the opportunity to sample data from all farms allowed partial enumeration of the producing units in the smaller size categories, which contained large numbers of producers, and a complete enumeration of the larger size categories, those which contain relatively few producers. Justification for desiring partial and complete enumeration will be presented later. Also, the Statistical Reporting Service prepared summaries of county data which would facilitate checking the data drawn in the sample for this study. Several other states[3/] will conduct somewhat similar studies. Thus by utilizing similar sources of data, the results from each state will be more comparable. The primary drawback of using county assessor's records is the presence of enumerator's and reporter's bias. After consulting with personnel in the Statistical Reporting Service, it was decided not to attempt to adjust for bias and not to publish the number of livestock produced within each subarea as derived through the

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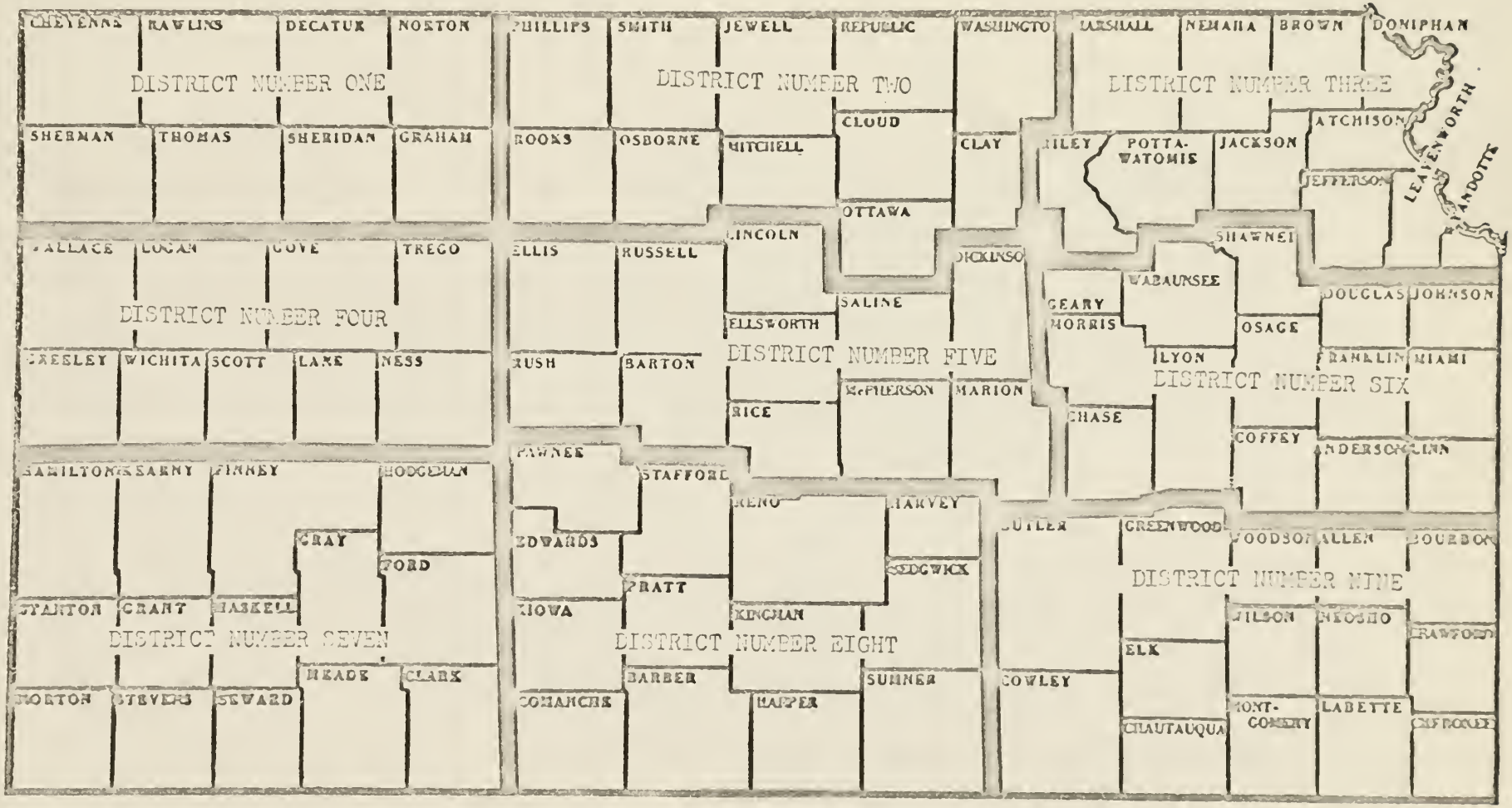
[3/] South Dakota, Indiana, North Dakota, and Ohio.

sample. Instead it was recommended that the percentage findings of this study be applied to state estimates obtained from the Kansas Statistical Reporting Service (See Tables 4, 5, and 6).

Selection of Subareas

Determining the subareas of the state was influenced by the source of the data. The Farm Management Association's districts, determined on the basis of similar agricultural background, have some merit, but summaries available through the Statistical Reporting Service would have to be reworked to adopt them to the Farm Management Association's subareas. With this in mind, it was decided to use crop reporting districts, as outlined by the United States Department of Agriculture, (See Fig. 4). The information released through the Statistical Reporting Service is based on these crop reporting districts.

Fig. 4. OUTLINE OF THE SUBAREAS USED IN THIS STUDY.



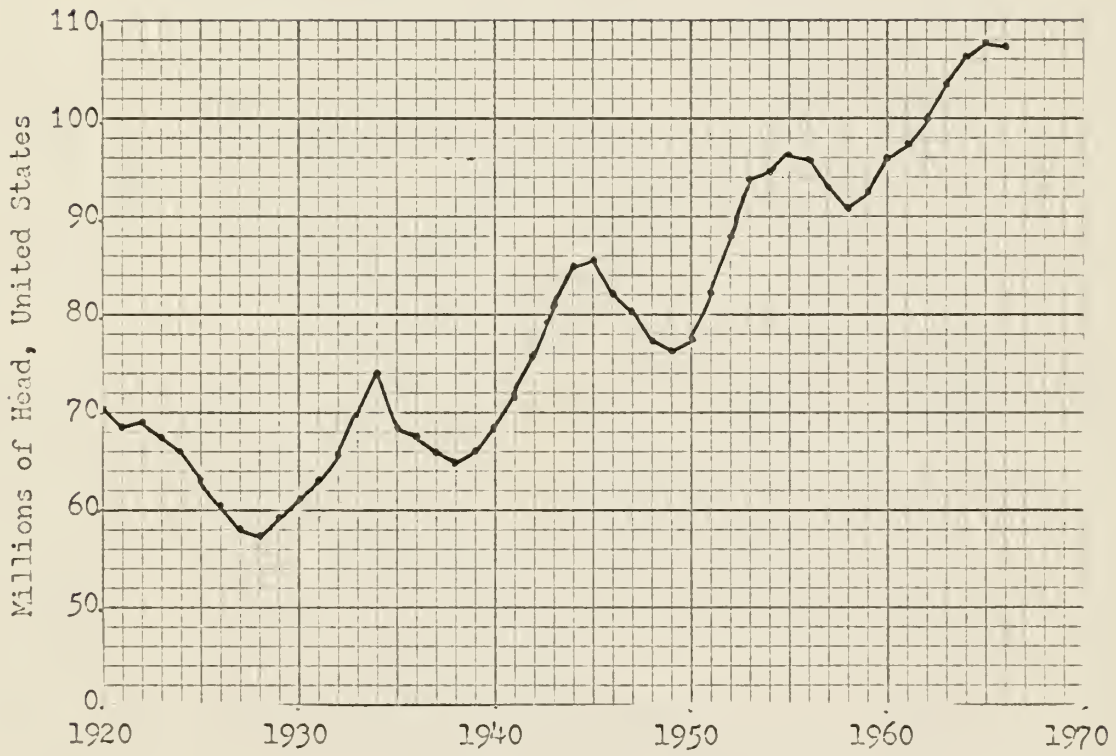
Selection of Years

Upon determining the source of the data and the subarea breakdown, it was then appropriate to select the years from which data would be collected to be analyzed. A complete listing was prepared of every livestock question asked by the county assessors since 1940. Also prepared were graphs of the livestock cycles (See Figures 5 and 6). Observing questions from the county assessor's records allowed selection of years with comparable questions.

Data from the year 1941 contained information on the number of grainfed cattle fattened and sold during the previous year (1940). Between the years 1941 and 1950 no direct questions concerning grainfed cattle marketings were asked, nor were there questions concerning grassfed cattle marketings until 1950. However, since 1950, questions concerning both grainfed and grassfed cattle marketings have been asked. No questions were asked relating to the number of hogs marketed, although a question requesting the number of pigs born and raised to weaning age was asked each year. Onfarm hog slaughter in Kansas is relatively insignificant; therefore it was felt that observing the number of pigs raised to weaning age would give a picture of the change occurring in the hog production picture across the state.[4/]

[4/] Hereafter reference to hog production and to hog producing units will refer to pigs raised to weaning age and to the farms raising pigs to weaning age.

Fig. 5. ALL CATTLE: NUMBER ON FARMS, JANUARY 1, 1920-1966.



Source: United States Department of Agriculture, "Agricultural Statistics", 1962, Table 455, 1965, Table 453.

Fig. 6. HOGS: NUMBER ON FARMS, UNITED STATES, JANUARY 1, 1920-1966.

Source: United States Department of Agriculturae, "Agricultural Statistics", 1962, Table 476, 1965, Table 473.

Figures 5 and 6 provide a picture of the trends which have occurred in the cattle and the hog cycle since 1920. The graphs picture the position of the cattle and hog cycle during the years from which data was selected for this study, i.e., 1940, 1950, 1960, and 1963. Locating these years on graphs of the livestock cycle enables one to determine the position in the livestock cycle of the year under consideration for study. A comparable position on the livestock cycle for each of the years selected was desired. This would allow changes to be reflected from forces other than those characteristic of the position of the livestock cycle itself. To explain, the build-up stage of a cycle is characterized by progressively larger calf crops, relatively low marketings and slaughter, and rising prices. The cut-back stage is featured by large marketings, declining prices, and smaller calf crops. Furthermore, slaughter during the rising trends includes relatively fewer cows and calves but, as inventory numbers decrease, cow and calf slaughter gets larger.[5/] Along with the comparable questions from the county assessor's records and the positions on the livestock cycle, a uniform time interval between years sampled was desired.

After referring to Figures 5 and 6, the available assessor's questions, and trying to maintain a uniform number of years between samples, it was decided to use data from the years 1941,

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5/Page 4. Arnold Nordquist and Howard Ottoson. "The Beef Cycle" E.C. 65-827. University of Nebraska, College of Agriculture and Home Economics and United States Department of Agriculture co-operating, October, 1965.

Determination of Size Categories

As was indicated in the section on objectives, meaningful size categories of livestock producing units were to be established. Few publications were located which contained size category studies that somehwat corresponded with the purposes sought in this study.[6/]

Realizing that in 1940 a considerable number of the producing units marketed very small numbers of livestock, small size category intervals would be necessary to reflect the changing trend in the concentration of livestock production. Also large size categories would be necessary to reflect the picture of today's commercial producers. District averages[7/] of the number of grainfed cattle marketed per farm[8/] indicated a range from 45 to 410 head.

[6/] Richard R. Newberg. "Livestock Marketing in the North Central Region, I. Where Farmers and Ranches Buy and Sell." North Central Regional Publication 104, Research Bulletin 846, Ohio Ag. Exp. Station, Wooster, Ohio. December, 1959.

"The Economics of Cattle Feeding." Special Report No. 1 Cooperative Extension Service, Montana State College, Bozeman, Mont. September, 1961.

Robert M. Finley and Ralph D. Johnson. "Changes in the Cattle Feeding Industry in Nebraska." S.B.-476, Neb. Ag. Exp. Station, Lincoln, March, 1963.

John A. Hopkin and Robert C. Kramer. "Cattle Feeding in California." Bank of America, Economic Research Department. February, 1965.

John H. McCoy. Unpublished data on the number and percent of farm operators and grainfed cattle marketed by size of operation, Kansas, 1954, 1958, and 1962.

[7/] "Kansas Cattle Marketing Statistics 1964." Kansas Crop and Livestock Reporting Service. December, 1965.

[8/] Hereafter referred to as producing units. The term 'farm' is misleading for commercial feed yards are also included in this study.

The state average number of grainfed cattle marketed per producing unit was 75 head. These averages indicated that small size categories are still important in Kansas. Thus the size categories selected for studying the producing units of grainfed cattle and grassfed cattle are as follows:

Size category number 1:	1 to 25 head
Size category number 2:	26 to 50 head
Size category number 3:	51 to 100 head
Size category number 4:	101 to 200 head
Size category number 5:	201 to 399 head
Size category number 6:	400 or more head

The 1959 Census of Agriculture tables[9/] indicated that an average number of 35 hogs were raised per producing unit. Thus it was felt that smaller size categories than those used for cattle would be employed in the study of hog production. Therefore the size categories selected were:

Size category number 1:	1 to 25 head
Size category number 2:	26 to 50 head
Size category number 3:	51 to 75 head
Size category number 4:	76 to 149 head
Size category number 5:	150 to 299 head
Size category number 6:	300 or more head

The exact intervals, set up for both cattle and hogs, were determined on the basis of the above discussion and the investigator's judgment.

9/ P. 188 Table 8 Livestock and Poultry Farms: Census of 1959 and 1954. Census of Agriculture U.S.D.A. 1959.

Method of Sampling

A preliminary sample, three percent (3%) of the population, was drawn from the 1965 assessor's records to obtain information necessary to indicate the size of the sample necessary to be drawn which would yield results with a 90 percent (90%) confidence interval. This is to say that the final results would be within ten percent (10%) of the actual numbers of producing units and of livestock. The standard errors of estimate computed from the final results of this study indicated that the desired confidence interval was obtained. The standard errors of estimate were computed for each type of livestock in every size category over all nine districts for the four years studied.

On the basis of insight gained from the preliminary sample, several alternative approaches to the method of sampling were considered. Taken into consideration was the possibility of attempting to stratify townships and/or counties according to volume of production. However, this presented complications because of the change in concentration which has occurred since 1940. Another possibility considered was to draw a random sample of counties and take a complete enumeration of the counties drawn. However, again the problem of changing importance between counties since 1940 would not become as apparent as was desired. Both of these procedures suffer from the problem that the same townships or counties would necessarily have to be observed for each year studied. In order that a picture of the overall changes in concentration within the state be observed, it was decided to take

a random sample of the producing units within each county in the state.

A decision concerning the size of the random sample was complicated by the unproportional numbers of producing units in each size category. The preliminary sample verified the fact that the higher size categories contained considerably fewer producing units than the smaller size categories. Therefore a more complete enumeration of the higher size categories, than of the lower size categories, would be required to maintain the desired alpha level. Also, there were fewer grainfed cattle producers than grassfed cattle producers. Therefore it was decided to select a sample of one out of every five (20%) grainfed cattle producers and one out of every ten (10%) grassfed cattle and hog producers. The problem of drawing a reliable sample, with non-proportional numbers of producing units, per size category, was eliminated by taking a complete enumeration of all producers of 400 or more head of cattle and of all producing units raising 150 or more hogs per year.

Procedure of Analysis

The Statistical Reporting Service's release "Kansas Cattle Marketing Statistics 1964" indicated that 14,500 farms marketed grainfed cattle in 1964. Drawing a sample of 20 percent of the population would result in data from about 3,000 producing units. This added to the number of producing units of grassfed cattle and hogs for the four years studied would result in a substantial amount of calculating. Therefore the 1410 I.B.M. computer on the Kansas State University campus was employed to calculate the results of this research.

The sample data was taken from the county assessor's records and transferred to Fortran coding sheets. Keypunch operators punched the data on cards. Each card contained information concerning the number of a specific type of livestock marketed from fourteen (14) producing units. Also each card was identified by a coding procedure which indicated the type of livestock information contained on that card, the year from which it was obtained, and the county and district in which the producing unit was located. The cards were assorted according to type of livestock, year of production, and finally according to district.

Three computer programs were prepared to analyze the data. The first program[10/] contained three parts. The first part determined the sample number of producing units, per size category,

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[10/] A copy of the computer program number one is included as Appendix Table Number 1.

and the sample number of livestock produced by these units according to districts and years. The second part of program number one computed the enlarged numbers of producing units and livestock produced according to the indicated size category breakdown. The third part computed the standard errors of estimate, referred to earlier, of the enlarged numbers of producing units and livestock produced.

Program number two[11] computed t-tests on all comparisons of years over each district for each size category to determine significant changes in the number of producing units and in the number of livestock produced. Due to the large numbers involved and the varied changes in concentration occurring since 1940, practically all of the computations denoted significant changes. Program number three[12] computed the percentages of producing units and of livestock produced in each size category per district for each year studied.

It was possible to check the sample data for validity. District and state totals computed from the sample were compared with both published and unpublished data obtained from the Statistical Reporting Service. Also utilized were Census of Agriculture data from the census years 1939, 1949, 1959, and 1964.

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[11] A copy of the computer program number two is included as Appendix Table Number 2.

[12] A copy of the computer program number three is included as Appendix Table Number 3.

CHAPTER IV

ANALYSIS OF DATA

Grainfed Cattle

State Trends

Tables 4, 5, and 6 denote an overall picture of the state trends occurring in the changing importance of the size categories of producing units and of the livestock marketed by these producing units. Table 4 exhibits the state number and percent of grainfed cattle in Kansas according to size categories for the years 1940, 1950, 1960, and 1963.[13/]

Definite decreasing trends, since 1940, in the percent of grainfed cattle marketed were observed in the size category 1 to 25 head. The actual number of cattle marketed by producing units in this size category, however, fluctuates with no definite trend.

13/ The 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 Services estimates. All totals were approved as Kansas Crop and Livestock Reporting Service estimates. The number of producing units marketing grassfed cattle (Table 5) was determined by deducting the estimated number of grainfed cattle farms from the Census of Agriculture records, which reported the total number of farms selling cattle.

Table 4. NUMBER AND PERCENT OF PRODUCING UNITS AND GRAINFED CATTLE MARKETED BY SIZE OF OPERATION FOR YEARS 1940, 1950, 1960, and 1963, KANSAS

	Size Category	1940 Number	1940 Percent	1950 Number	1950 Percent	1960 Number	1960 Percent	1963 Number	1963 Percent
Grainfed Cattle	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	60,518	16.01	58,590	13.95	182,783	21.58	413,857	39.07
	TOTAL	378,000		420,000		847,000		1,059,000	
Producing Units	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	

Table 5. NUMBER AND PERCENT OF PRODUCING UNITS AND GRASSFED CATTLE MARKETED BY SIZE OF OPERATION FOR YEARS 1950, 1960, 1963, KANSAS

	Size Category	1950 Number	1950 Percent	1960 Number	1960 Percent	1963 Number	1963 Percent
Grassfed Cattle	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	
Producing Units	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	

Table 6. NUMBER AND PERCENT OF PRODUCING UNITS AND HOGS PRODUCED BY SIZE OF OPERATION FOR YEARS 1940, 1950, 1960, 1963, KANSAS

	Size Category	1940 Number	1940 Percent	1950 Number	1950 Percent	1960 Number	1960 Percent	1963 Number	1963 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	1,899,000		2,183,000		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
	150 - 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	

shared the remaining percent of cattle. A slight change in this picture occurred in 1960, with the size category 400 or more head reversing positions of importance with the category 1 to 25 head. The 1963 data indicates that the importance of the size category 400 or more head has greatly increased while the category 1 to 25 head continued its reduction.

Very little difference existed between size categories concerning the number and percent of grainfed cattle marketed. The greatest differences were observed in 1963. This is not the picture of the producing units of grainfed cattle. The greatest differences between size categories occurred in 1940, with a trend toward evening out as we progress to 1963. Note that in 1940, 78 percent of the producing units marketed 23 percent of the grainfed cattle in size category 1 to 25 head, while the size category 400 or more head accounted for only .5 percent of the producing units marketing 16 percent of the cattle. In 1963 the size category 1 to 25 head lost importance such that it accounted for only 53 percent of the producers and 9 percent of the cattle, while the size category 400 or more head, containing 2 percent of the producers marketed 39 percent of the grainfed cattle. This data indicates the trend toward larger scale operations.

Similar changes as in the grainfed cattle picture may be observed in Tables 5 and 6 for grassfed cattle and hog production. However, the size category 400 or more head did not increase in importance as much in Table 5 as it did in Table 4. A very sig-

nificant increase in the percents of hogs produced in size categories 150 to 299 and 300 or more head have offset the reduction in the lower three categories in Table 6.

Grainfed Cattle

Analysis of the Producing Units

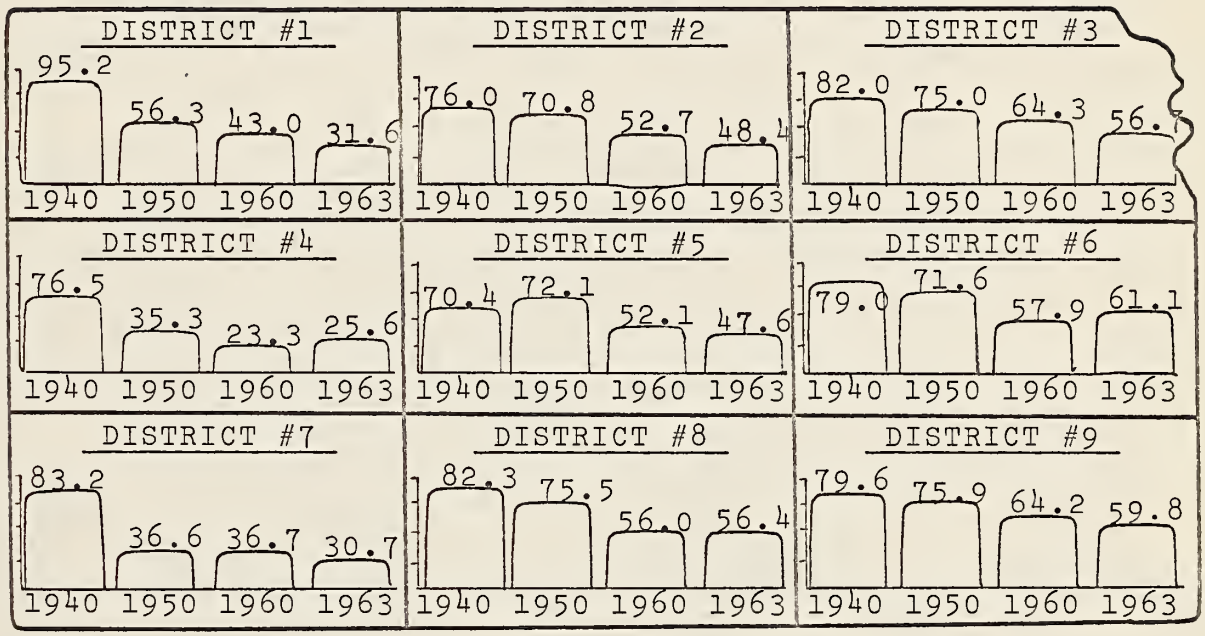

Fig. 7. Y axis scaled 0-100%. District PERCENT OF PRODUCING UNITS in the size category 1 to 25 head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figures 7 through 12 each denote the district percent of producing units, in a designated size category, which marketed grainfed cattle during the years 1940, 1950, 1960, and 1963. Figure 7 exhibits a picture of the change in the percent of producing units, in size category 1 to 25 head, marketing grainfed cattle. For example; in 1940, 95 percent of the producing units in district number one marketed between 1 and 25 head of cattle. In 1963, only 32 percent of the producing units marketed between 1 and 25 head of grainfed cattle.

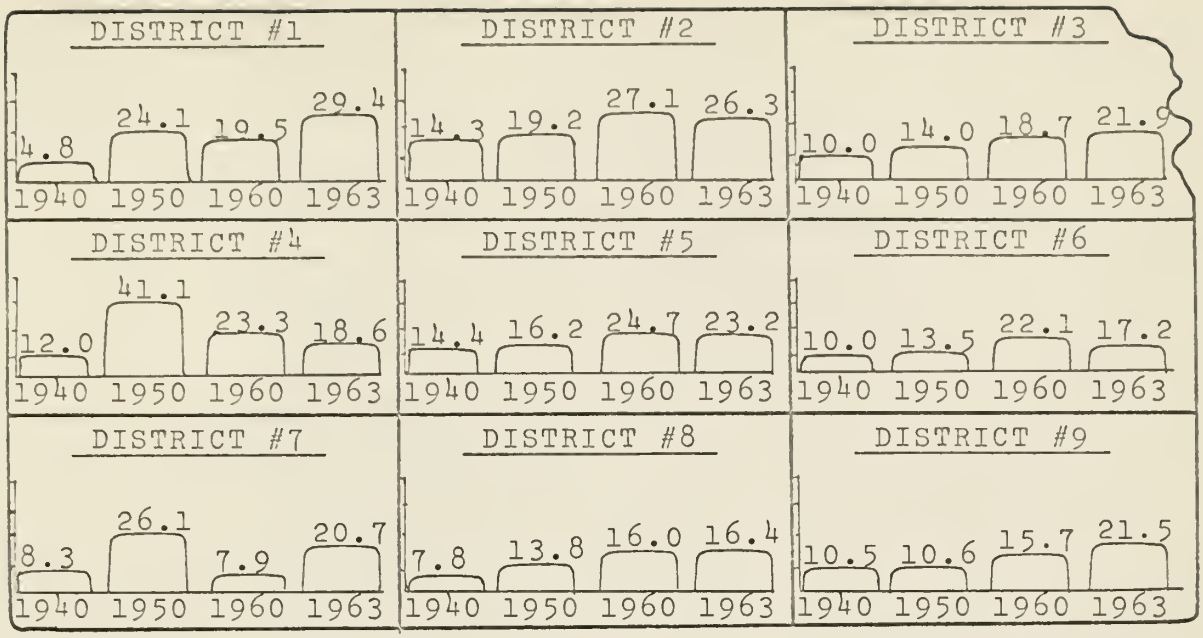

Fig. 8. Y axis scaled 0-50%. District PERCENT OF PRODUCING UNITS in the size category 26 to 50 head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

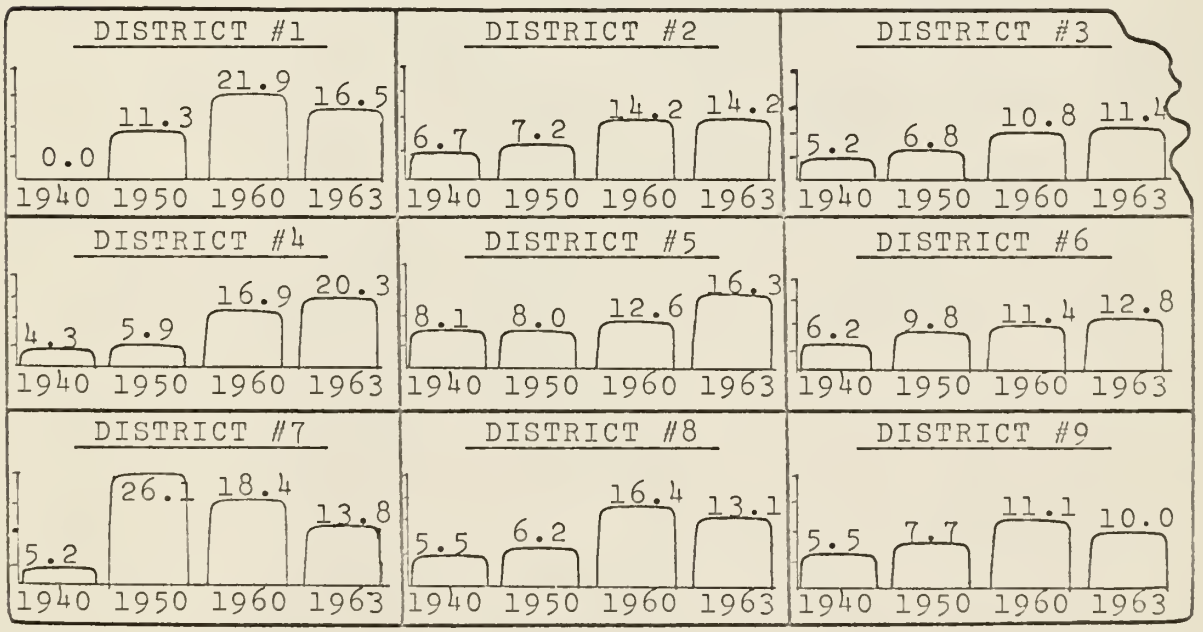

Fig. 9. Y axis scaled 0-25%. District PERCENT OF PRODUCING UNITS in the size category 51 to 100 head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

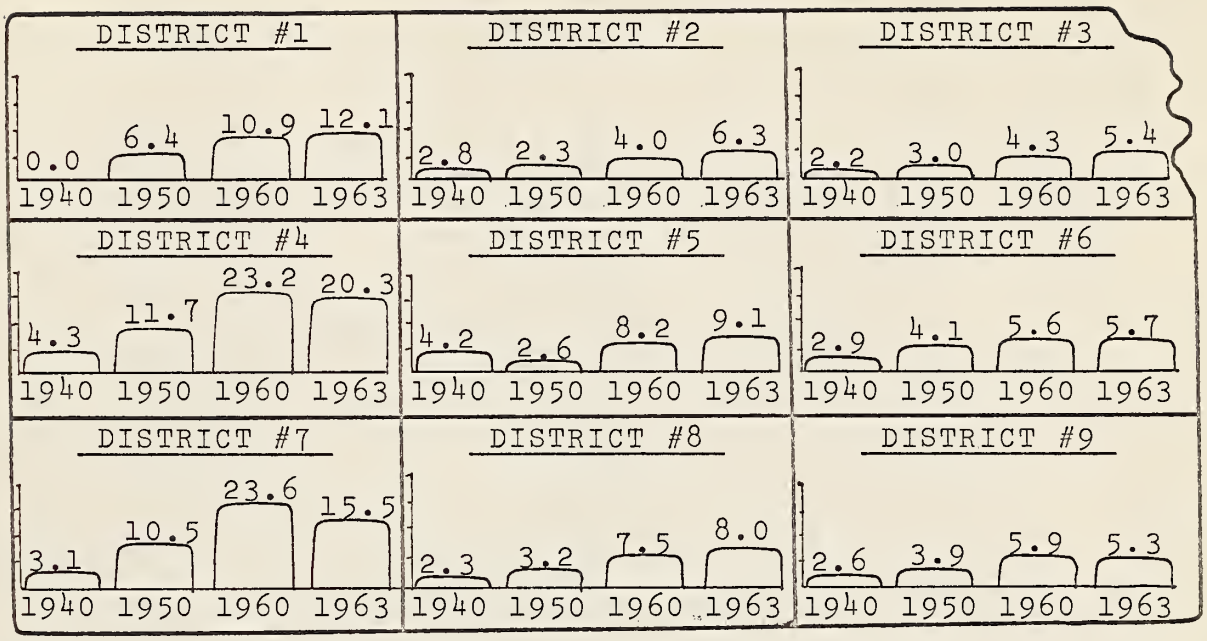

Fig. 10. Y axis scaled 0-25%. District PERCENT OF PRODUCING UNITS in the size category 101 to 200 head, marketing grain-fed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

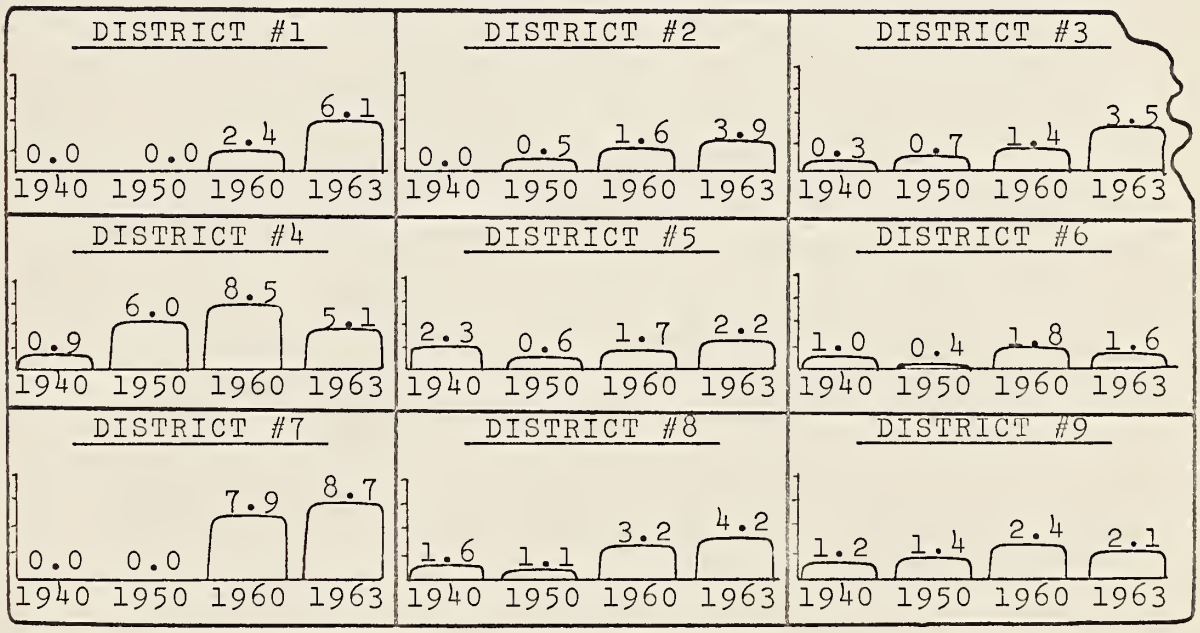

Fig. 11. Y axis scaled 0-10%. District PERCENT OF PRODUCING UNITS in the size category 201 to 399 head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, KANSAS. Source: County assessor's records.

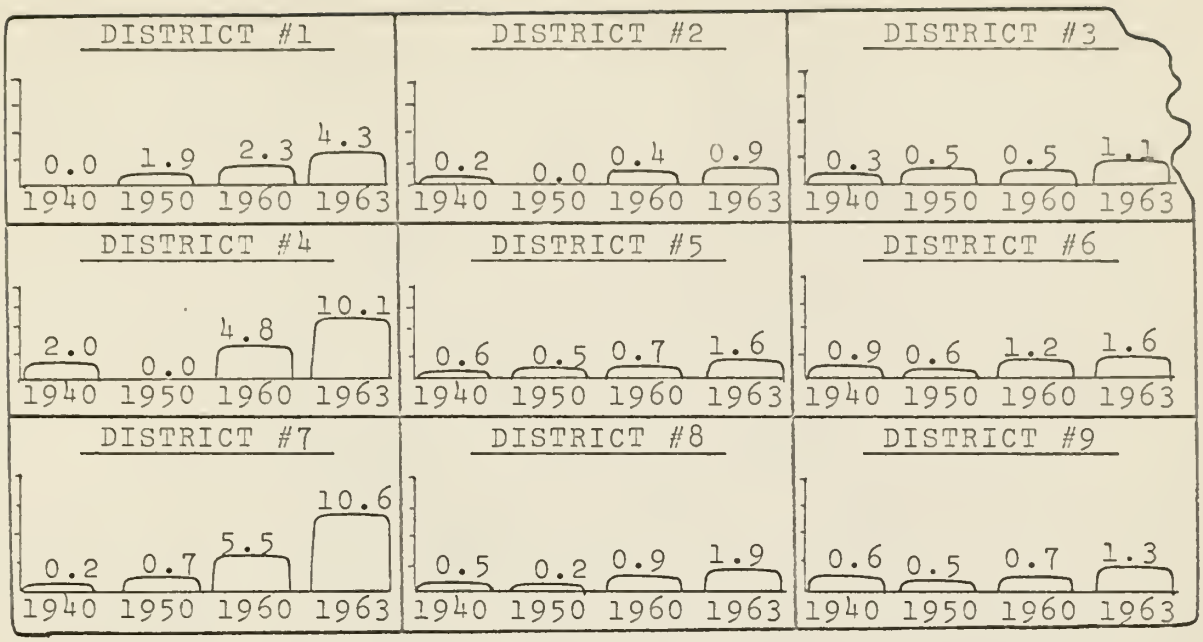

Fig. 12. Y axis scaled 0-15%. District PERCENT OF PRODUCING UNITS in the size category 400 or more head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

As can be seen in Fig. 7, all districts have experienced generally decreasing trends since 1940. However, all districts have not changed proportionally. Greater reductions have occurred in the western one-third of the state than in the eastern one-third. Reasoning for this will be evident later in the paper when attention is called to the number of producing units across the state marketing grainfed cattle.

Figures 8 through 12 all denote increasing trends in the percent of producing units marketing grainfed cattle in the indicated size categories. The only deviation occurs in Fig. 8 which shows erratic changes in percent since 1940 in the western one-third of the state. No definite trend is noticable in this region of the state in the size category 26 to 50 head.

It is significant that in the size categories 26 head and larger, the growth in percent is larger in the western one-third of the state than in the eastern one-third. This indicates that larger scale producing units are becoming relatively more important in the western one-third of the state than in the eastern one-third. Also the growth in percent is larger as one moves to successively larger size categories.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th											
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK

Fig. 13. The ranking procedure of districts, indicating the relative district importance. Ranks range from 1 to 9. Example of interpretation: District number one ranked ninth (9th) in 1940. Thus in 1940, district number one had the smallest number of units being considered.

Figures 14 through 19 indicate changes in concentration among the nine districts in Kansas in terms of the number of producing units, classified according to size categories, marketing grainfed cattle. The procedure used ranks the district with the greatest number of producing units marketing grainfed cattle, in the size category indicated, as first and the district having the least number of producing units that year as ninth. This method of presentation indicates areas of concentration within size categories. Figure 13 is presented to explain the interpretation of Figures 14 through 19.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	7th	7th	7th	6th	4th	4th	4th	3rd	1st	1st	2nd
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	9th	9th	9th	5th	5th	6th	6th	1st	2nd	2nd	1st
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	8th	8th	4th	6th	5th	5th	2nd	3rd	3rd	3rd

Fig. 14. Rank of district according to NUMBER OF PRODUCING UNITS in the size category 1 to 25 head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figure 14, containing district rank in terms of numbers of producing units marketing from 1 to 25 head of grainfed cattle, indicates that very little change has occurred in the state as to where the small producers are located. It was observed in Fig. 7 that the percent of producing units marketing from 1 to 25 head of grainfed cattle has decreased in every district of the state. It is apparent from Fig. 14 that the western one-third of the state has retained the rank positions 7th, 8th, and 9th since 1940, the central one-third of the state has retained the ranks 4th, 5th, and 6th and the eastern one-third, 1st, 2nd, 3rd. Therefore essentially no east-west change has occurred since 1940 in the relative concentration of the producing units marketing from 1 to 25 head of grainfed cattle.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	7th	7th	6.5	5th	3rd	3rd	2nd	3rd	2nd	2nd	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	8th	8th	9th	4th	4th	4th	5th	2nd	1st	1st	3rd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	9th	9th	8th	6th	6th	6th	6.5	1st	5th	5th	4th

Fig. 15. Rank of district according to NUMBER OF PRODUCING UNITS in the size category 26 to 50 head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	7th	7th	7th	5.5	4th	4th	3rd	3rd	2nd	2nd	2nd
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7.5	9th	8th	8th	4th	5th	6th	4th	1st	1st	1st	1st
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7.5	8th	9th	9th	5.5	6th	3rd	6th	2nd	3rd	5th	5th

Fig. 16. Rank of district according to NUMBER OF PRODUCING UNITS in the size category 51 to 100 head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	7th	7th	7th	5.5	4.5	6th	4th	3.5	2nd	3.5	1.5
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	8.5	8th	8th	3.5	6th	2nd	3rd	1st	1st	1st	1.5
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8.5	9th	9th	5.5	4.5	5th	5th	2nd	3rd	3.5	6th

Fig. 17. Rank of district according to NUMBER OF PRODUCING UNITS in the size category 101 to 200 head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8.5	8.5	4th	8th	5.5	5.5	2nd	5th	2nd	4th	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
6th	7th	7th	9th	2.5	5.5	5.5	7.5	2.5	3.5	1.5	5.5
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8.5	8.5	7.5	4th	3.5	1.5	3rd	1st	1st	3rd	5.5

Fig. 18. Rank of district according to NUMBER OF PRODUCING UNITS in the size category 201 to 399 head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	5th	4.5	3rd	7th	8.5	9th	9th	3rd	1st	2nd	4.5
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
6th	8.5	7th	4.5	4th	4th	6th	7th	1st	2nd	1st	2nd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	7th	8th	1st	5th	6th	4.5	8th	2nd	3rd	3rd	6th

Fig. 19. Rank of district according to NUMBER OF PRODUCING UNITS in the size category 400 or more head, marketing grainfed cattle for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figure 15 denotes some change in district concentration of the producing units marketing from 26 to 50 head since 1940. The northern one-third of the state has become more concentrated, increasing in rank from 9th, 5th, and 3rd to a tie for 6th, 2nd, and 1st in the northwest, central, and northeast districts respectively.

Figure 16, concerned with the rank of the number of producing units marketing from 51 to 100 head of cattle, and Fig. 17 denoting rank of producing units marketing from 101 to 200 head, indicate similar changes and will be discussed together. As in Fig. 15, Figures 16 and 17 show that the northern one-third of the state has increased in importance since 1940. However, Figures 16 and 17 also indicate that the southern one-third of the state has decreased in importance, with every district in the southern

one-third of the state losing rank. Again it can be seen that the eastern one-third of the state has maintained its position of predominance in total numbers of producing units marketing grain-fed cattle. However, district number nine, in the southeast corner of the state, has shown a marked decrease in concentration in both Figures 16 and 17.

Figure 18 depicts definite changes in rank among the districts. Concerned with the number of producing units marketing between 201 and 399 head of cattle, Fig. 18, indicates a more scattered change across the state. However, again it is apparent that the northern one-third of the state has become more concentrated, and that District number nine has greatly decreased in importance. Figure 18 shows a new pattern; the central one-third of the state has decreased in concentration in this size category of producers.

Figure 19, containing district rank in terms of numbers of producing units marketing 400 or more head of cattle, indicates some very definite patterns across the state. It is apparent that the western one-third of the state greatly increased in concentration, whereas the central one-third and the eastern one-third of the state has decreased. It is obvious that the central one-third has become the least area of concentration in the numbers of producing units marketing 400 or more head of grainfed cattle.

Analysis of Grainfed Cattle Marketings

Figures 20 through 25 indicate changes, which have occurred since 1940, in the percent of cattle marketed per district each year by producing units classified according to the six size categories. For instance, in district number one, in 1940, 77 percent of the grainfed cattle were marketed by producers in the 1 to 25 head size category. By reading across the years in each district, one can observe the change occurring in the percent of cattle marketed in the indicated size category. Also comparison may be made as to the relative importance of the size category to the different districts. It must be remembered that the total number of cattle influences the rate of change in percent associated with a change in the number of head marketed. Thus a change of 800 head of cattle will have a greater influence on the rate of change in percent if the total number of head is 2,000, than if it is 50,000.

Figure 20 indicates that the percent of livestock marketed by producing units in the 1 to 25 head size category has decreased in all districts of Kansas since 1940. It is also apparent that the decreasing trend has been the greatest in the western one-third of the state. This observation is supported by Fig. 7 which indicated a corresponding reduction in the percent of producing units marketing cattle in the 1 to 25 head size category.

Figure 21 presents a definite pattern of reduction in percents of grainfed cattle marketed per district in the 26 to 50 head size category, however, the reductions are less evident in

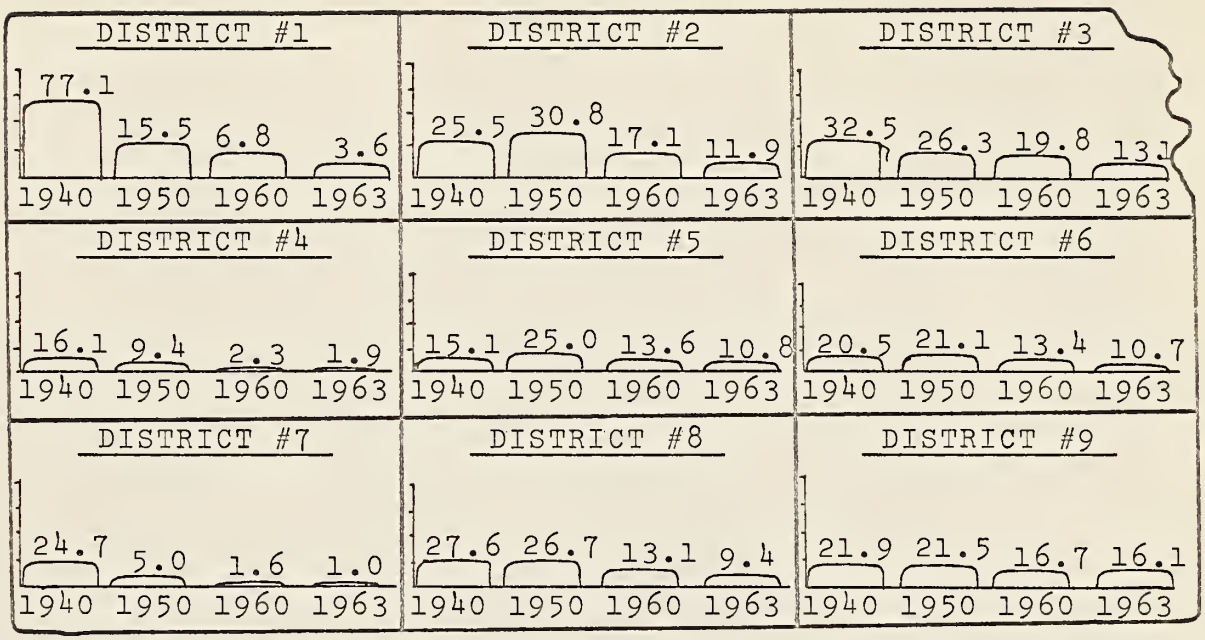

Fig. 20. Y axis scaled 0-100%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category 1 to 25 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

that size category than were the reductions in the 1 to 25 head size category. The only deviation from the generally decreasing trend occurred in District number nine, which indicates a slight upward trend since 1950. The state average (Table 4) denoted a definite decrease in the percent of livestock marketed by producing units in this size category.

Figure 22 shows different trends among the districts. The state average (Table 4) registers a generally decreasing trend in the 51 to 100 head size category. However, districts number one and number five exhibit definite increasing trends while districts number six and number seven suggest decreasing trends. Erratic changes have occurred in the remaining districts, with no definite pattern.

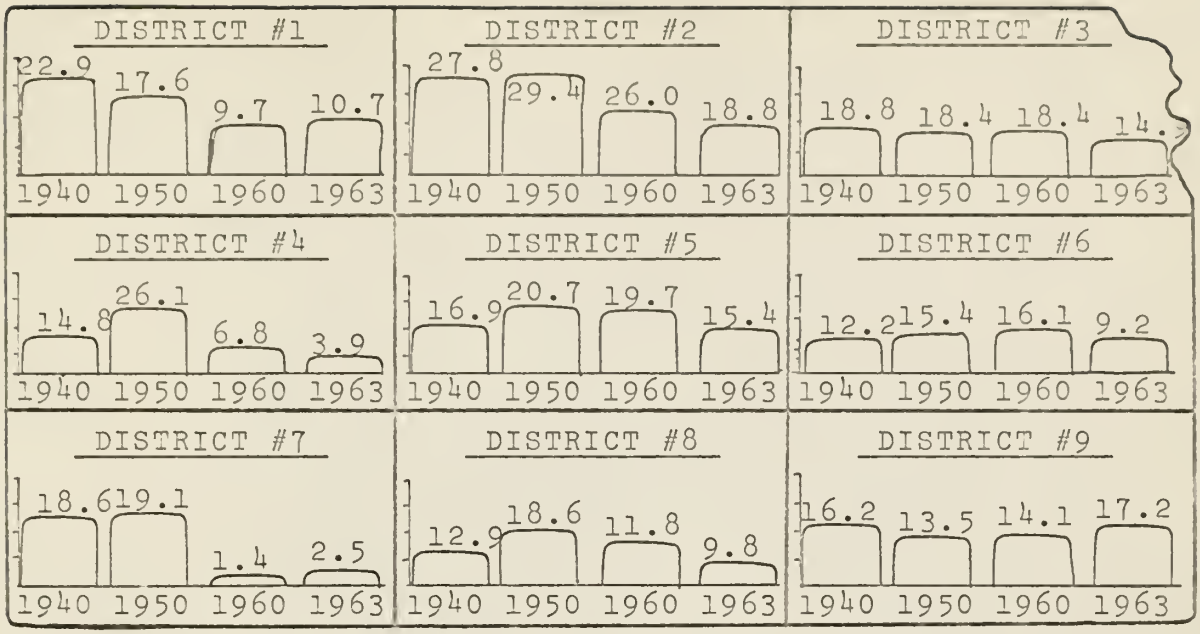

Fig. 21. Y axis scaled 0-30%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category 26 to 50 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

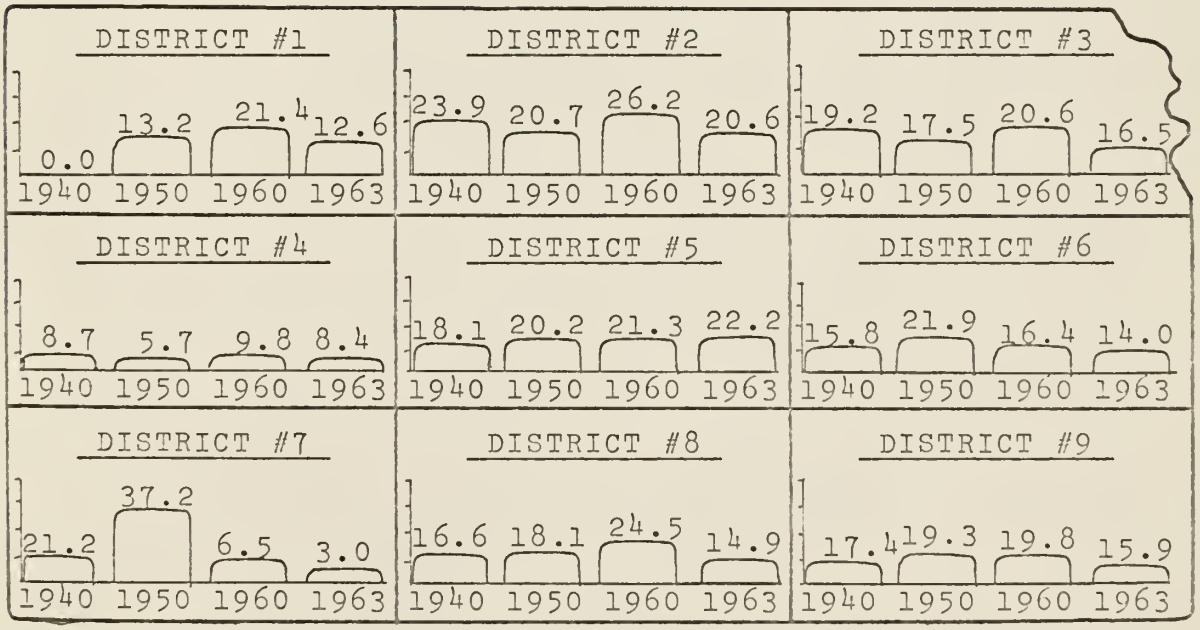

Fig. 22. Y axis scaled 0-50%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category 51 to 100 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

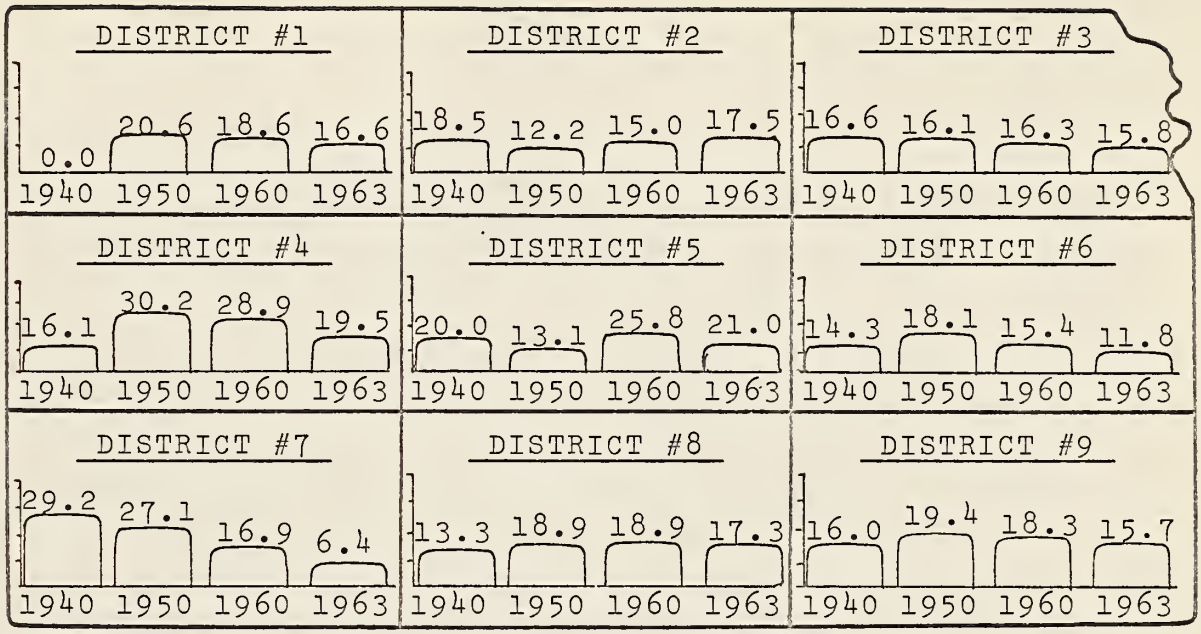

Fig. 23. Y axis scaled 0-50%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category 101 to 200 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

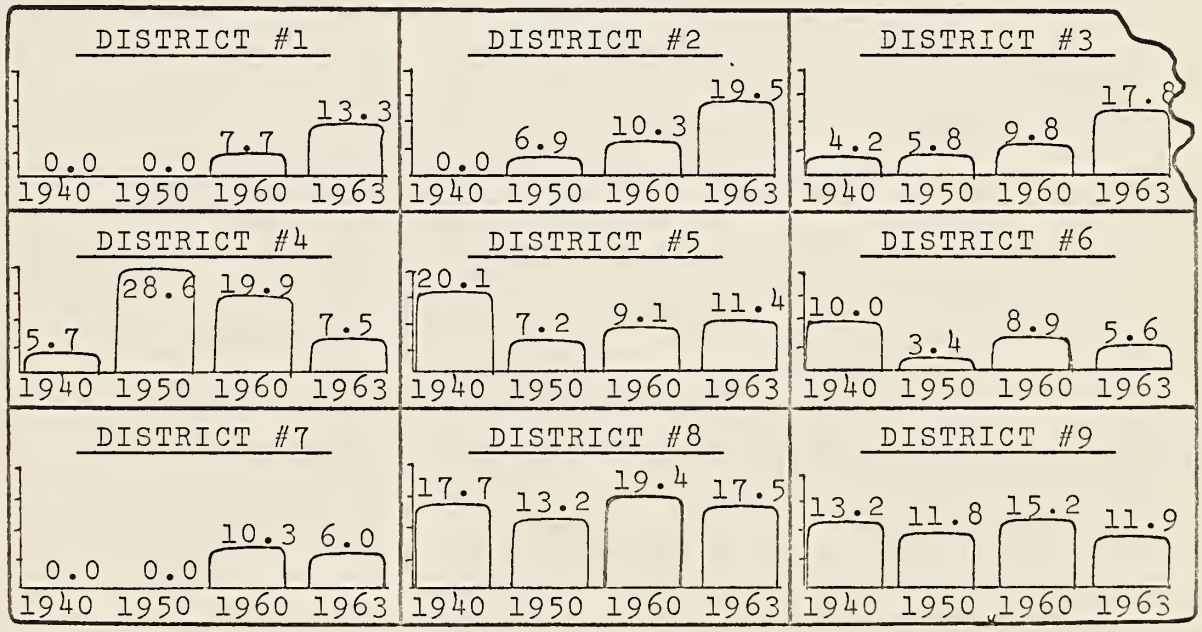

Fig. 24. Y axis scaled 0-25%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category 201 to 399 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

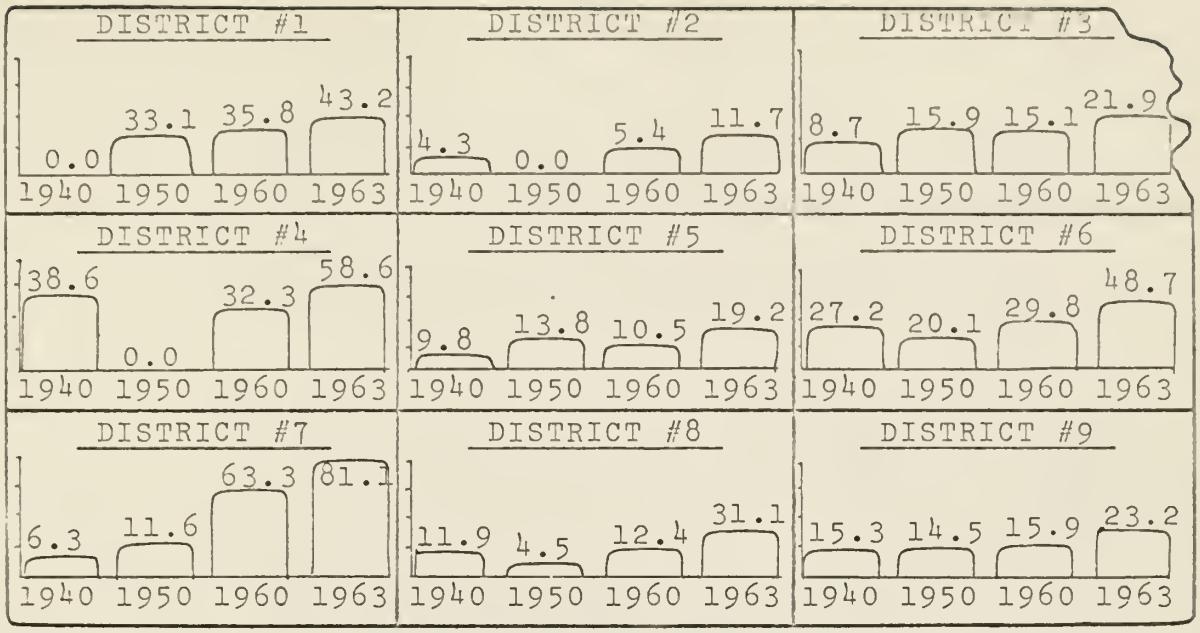

Fig. 25. Y axis scaled 0-100%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category 400 or more head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

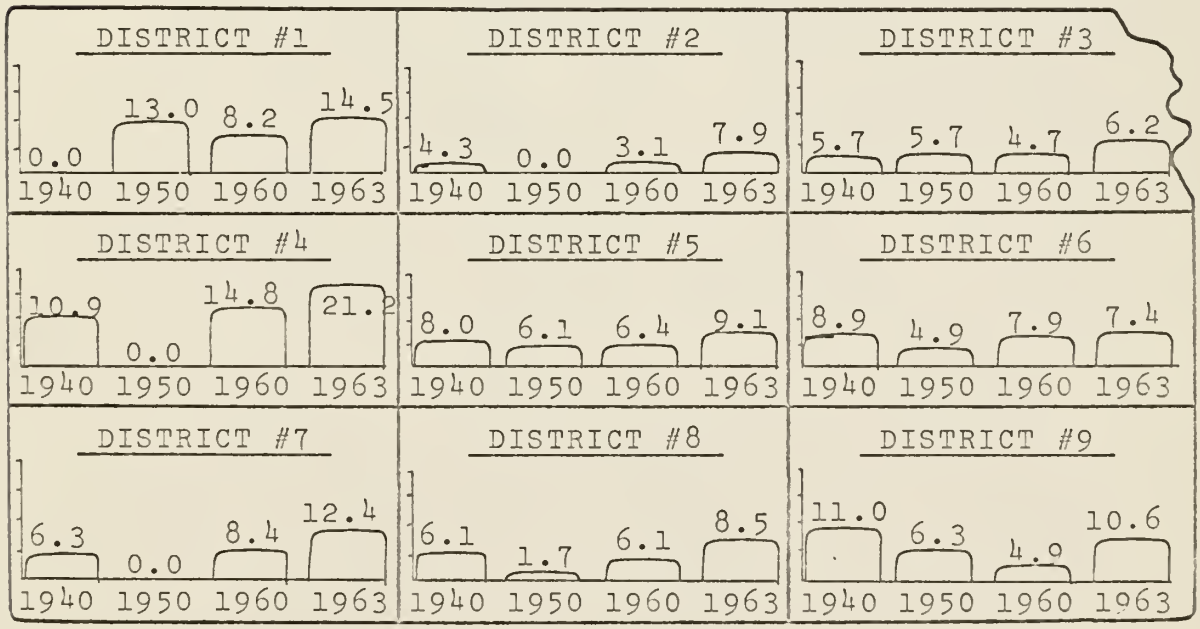

Fig. 26. Y axis scaled 0-25%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category 400 to 750 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

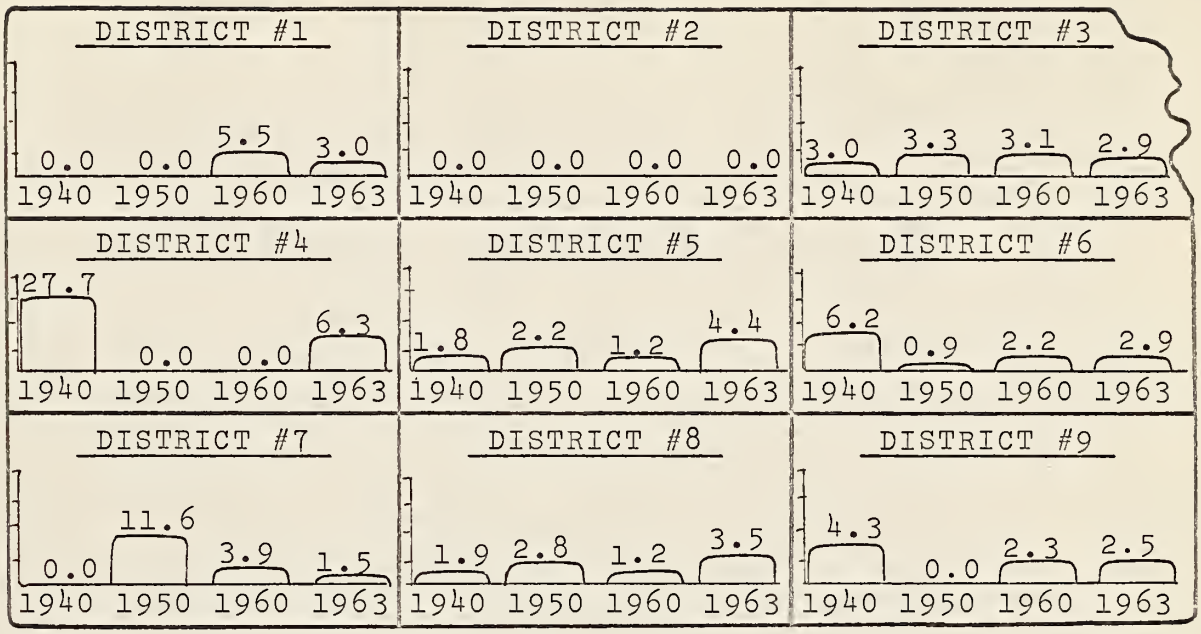

Fig. 27. Y axis scaled 0-30%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category 751 to 1,000 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

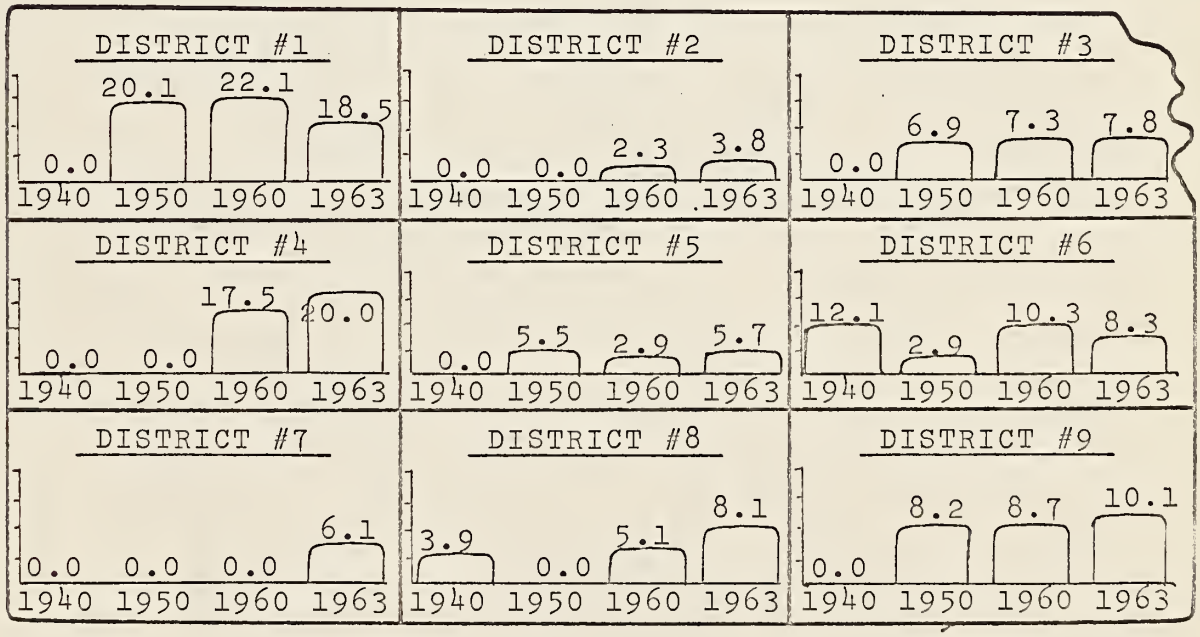

Fig. 28. Y axis scaled 0-25%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category 1,001 to 5,000 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

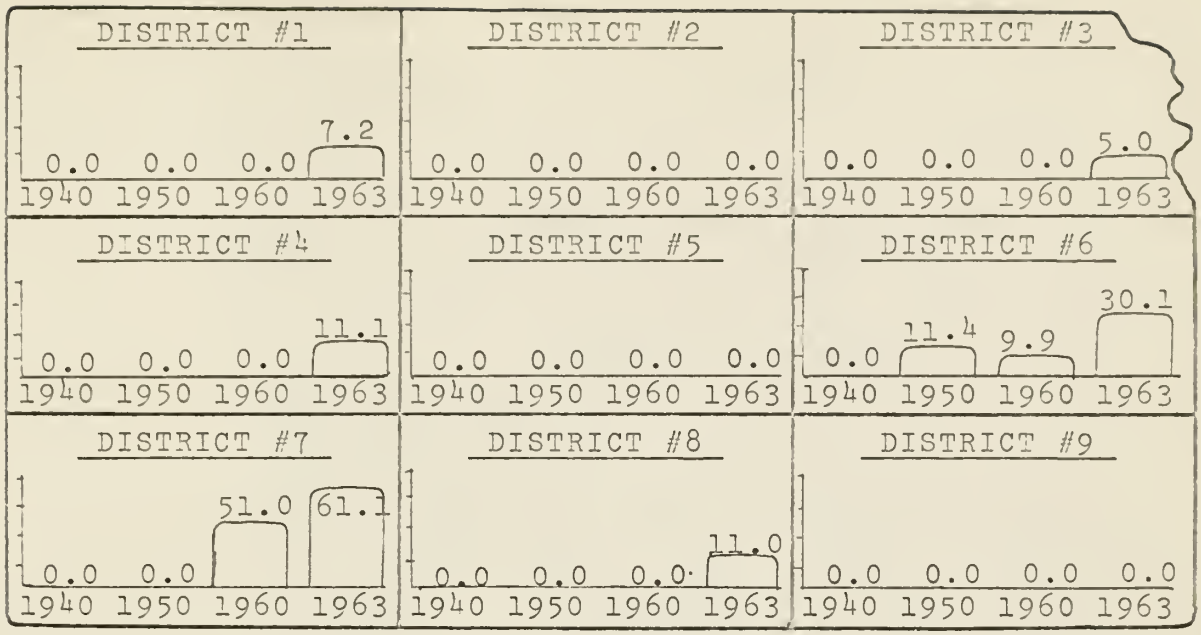

Fig. 29. Y axis scaled 0-65%. District PERCENT OF GRAINFED CATTLE MARKETED BY PRODUCING UNITS in the size category more than 5,000 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

The state's average percent (Table 4) of grainfed cattle marketed by producing units in the 101 to 200 head size category exhibits no definite pattern of change since 1940. Figure 23 does exhibit change in several districts. District number seven shows the greatest consistent reduction since 1940, while districts number two, three, six, eight, and nine manifest virtually no change.

Figure 24 gives evidence of increasing trends in the northern one-third of the state, but erratic trends elsewhere. Thus the percent of grainfed cattle marketed by producing units in the 201 to 399 head size category has become relatively more important in the northern one-third of the state. It may be observed from Fig. 9 however, that in all districts the percent of producing units, in the size category, increased slightly. The erratic

change occurring in Fig. 24 may be explained by offsetting increases in the numbers of cattle marketed in the other size categories.

Figure 25 points out the greatly increasing trend occurring in the percent of cattle marketed by producing units in the 400 head or more category. Marked increases have occurred in the western one-third of the state. A comparison with state averages presented in Table 4 indicates that in 1940, .5 percent of the producing units marketed 400 or more head of cattle and this accounted for 16 percent of the grainfed cattle marketed that year, whereas in 1963, 2 percent of the producing units in that size category marketed 39 percent of the cattle.

Figure 25 does not reflect a complete picture. Observe Figures 26 through 29, which represent a breakdown of Fig. 25 into four size categories; 400 to 740, 751 to 1,000, 1,000 to 5,000, and more than 5,000 head. Figure 29, indicating the percent of grainfed cattle marketed by producing units in the size category or more than 5,000 head, distorts the picture in Fig. 25. Note data on districts number six and seven in Appendix Table number 4. This data indicates that in 1960, 0.1 percent of the producing units in district number six marketed 9.4 percent of the grainfed cattle in that district, in 1963, 0.1 percent of the producing units marketed 30.1 percent of the cattle.

In District number seven, one percent of the producing units marketed 51 percent of the cattle in 1960, and in 1963, one percent of the producing units marketed 61.1 percent of the grainfed

cattle. Figures 26 to 29 point out that important quantities of grainfed cattle are marketed by large scale producing units.

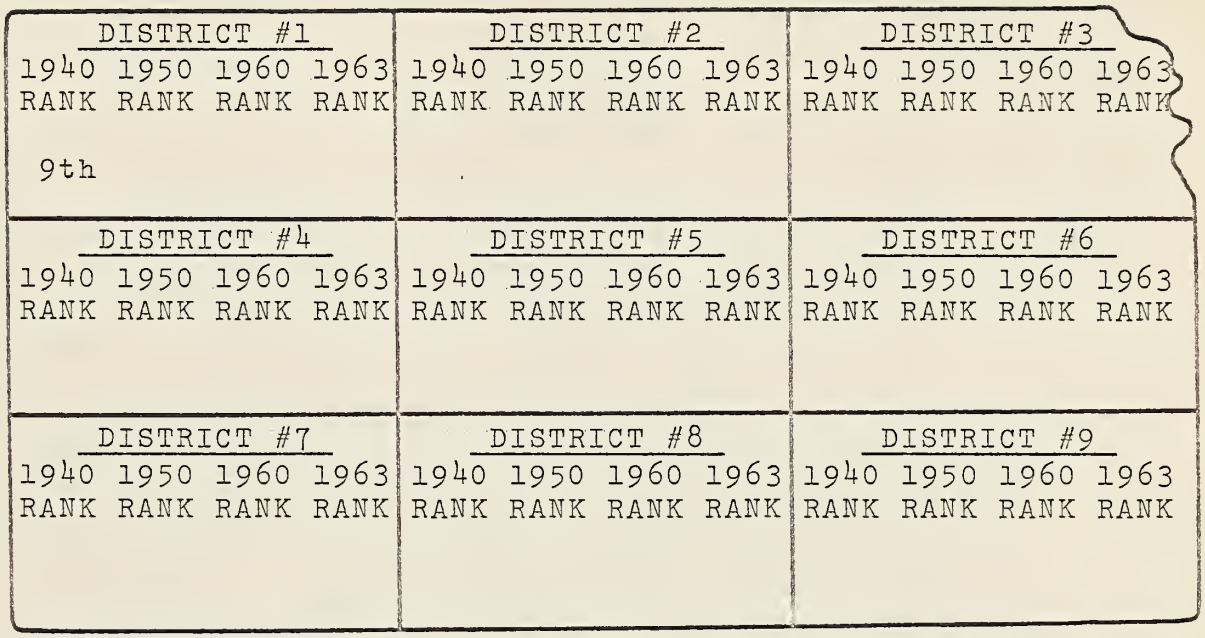

Fig. 30. The ranking procedure of districts, indicating the relative district importance. Ranks range from 1 to 9. Example of interpretation: District number 1 ranked ninth (9th) in 1940. Thus in 1940, district number 1 had the smallest number of units being considered.

Figure 30 is presented to explain the interpretation of Figures 31 through 36. Figures 31 through 36 indicate changes in concentration among the nine districts in Kansas in terms of the numbers of grainfed cattle marketed by producing units classified according to size categories. The procedure used ranks the district which marketed the greatest number of grainfed cattle, by producing units in the indicated size category as 1st and the district with the lowest number of cattle marketed that year as 9th.

The difference between Figures 14 to 19 and 31 to 36 is that the prior figures registered rank change in terms of NUMBERS OF PRODUCING UNITS classified in six size categories marketing grainfed cattle, whereas Figures 31 to 36 indicate rank change in terms

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	7th	7th	7th	6th	3rd	4th	4th	2nd	1st	1st	2nd
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	8th	8th	9th	5th	5th	5th	5th	1st	2nd	2nd	1st
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	9th	9th	8th	4th	6th	6th	6th	3rd	4th	3rd	3rd

Fig. 31. Rank of districts according to the NUMBER OF GRAINFED CATTLE MARKETED by PRODUCING UNITS in the size category 1 to 25 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

of total NUMBERS OF GRAINFED CATTLE MARKETED by producing units in the six different size categories.

Figure 31 shows that very little change in concentration has occurred between districts when measured by the total number of grainfed cattle marketed by producing units classified according to size category 1 to 25 head. Figure 20 indicated that the percent of grainfed cattle marketed in this size category decreased in every district, therefore we must assume that the decrease was proportional among districts, since the rank did not differ greatly from 1940 to 1963. This supports the conclusion reashed in Fig. 14 concerning the number of producing units that marketed cattle in this size category.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	7th	7th	6th	5th	3rd	3rd	2nd	3rd	2nd	2nd	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	8th	8th	9th	4th	4th	4th	5th	2nd	1st	1st	3rd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	9th	9th	8th	6th	6th	6th	7th	1st	5th	5th	4th

Fig. 32. Rank of districts according to the NUMBER OF GRAINFED CATTLE MARKETED by PRODUCING UNITS in the size category 26 to 50 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	7th	7th	7th	5th	4th	4th	4th	3rd	2nd	2nd	2nd
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	9th	8th	8th	4th	5th	5th	3rd	1st	1st	1st	1st
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	8th	9th	9th	6th	6th	3rd	6th	2nd	3rd	6th	5th

Fig. 33. Rank of districts according to the NUMBER OF GRAINFED CATTLE MARKETED by PRODUCING UNITS in the size category 51 to 100 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	7th	7th	7th	5th	6th	6th	4th	3rd	2nd	3rd	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	8th	8th	8th	4th	5th	2nd	3rd	1st	1st	1st	2nd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	9th	9th	9th	6th	4th	5th	5th	2nd	3rd	4th	6th

Fig. 34. Rank of districts according to the NUMBER OF GRAINFED CATTLE MARKETED by PRODUCING UNITS in the size category 101 to 200 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8.5	9th	4th	8th	6th	6th	2nd	5th	2nd	4th	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
6th	7th	7th	9th	3rd	5th	5th	6th	2nd	4th	2nd	7th
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8.5	8th	8th	4th	3rd	1st	3rd	1st	1st	3rd	5th

Fig. 35. Rank of districts according to the NUMBER OF GRAINFED CATTLE MARKETED by PRODUCING UNITS in the size category 201 to 399 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	5th	3rd	3rd	7th	8.5	9th	9th	3rd	2nd	4th	4th
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
6th	8.5	7th	5th	5th	4th	8th	8th	1st	1st	1st	2nd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	7th	2nd	1st	4th	6th	6th	6th	2nd	3rd	5th	7th

Fig. 36. Rank of districts according to the NUMBER OF GRAINFED CATTLE MARKETED by PRODUCING UNITS in the size category 400 or more head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figure 32 denotes changes in the number of cattle marketed by producing units in the 26 to 50 head size category. It is apparent that the northern one-third of the state has increased in rank while the remainder of the state indicates no definite trend. This is also true in Figures 33 and 34, however it is evident that District number nine experienced a reduction in concentration. Figures 16 and 17 hinted at decreasing trends in the number of producing units in the southern one-third of the state. Figures 33 and 34 suggest that this is correct.

Figure 35 also supports the fact that the northern one-third of the state has increased in concentration in the number of cattle marketed. Figure 35 implies that the central one-third of the state has lost rank in the number of head marketed by farms in

the 201 to 399 head size category. The reduction in concentration in District number nine is also evident, while District number three increased from 5th to 1st.

Figure 36 denotes a significant trend in the shift in concentration of producing units marketing 400 or more head of grain-fed cattle. As is apparent, the western one-third of the state has greatly increased in concentration, with District number eight's rank increasing from 8th to 1st and district number one changing from 9th to 3rd. The remainder of the state has experienced a reduction in rank in every district. Again a significant reduction occurred in District number nine. District number six remained the most concentrated district until 1963 at which time District number seven gained 1st place.

Grassfed Cattle

Analysis of the Producing Units

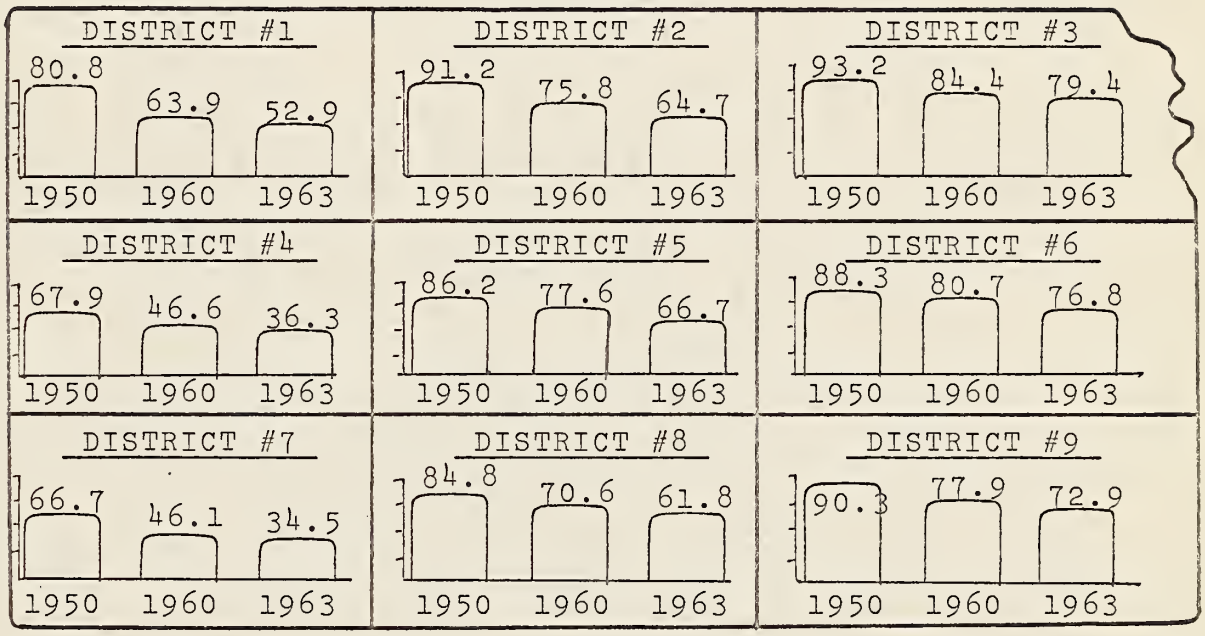

Fig. 37. Y axis scaled 0-100%. District PERCENT OF PRODUCING UNITS in the size category 1 to 25 head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figures 37 through 42 indicate changes within districts, in the percent of producing units that have marketed grassfed cattle according to selected size categories for the three years studied. Thus, in 1950 in District number one, 81 percent of the producing units that marketed grassfed cattle, marketed between 1 and 25 head, 14 percent marketed between 26 and 50 head, and 4 percent of the units marketed between 51 and 100 head.

Figure 37, denotes decreasing percents of producing units marketing from 1 to 25 head of grassfed cattle since 1950 in every district in Kansas.

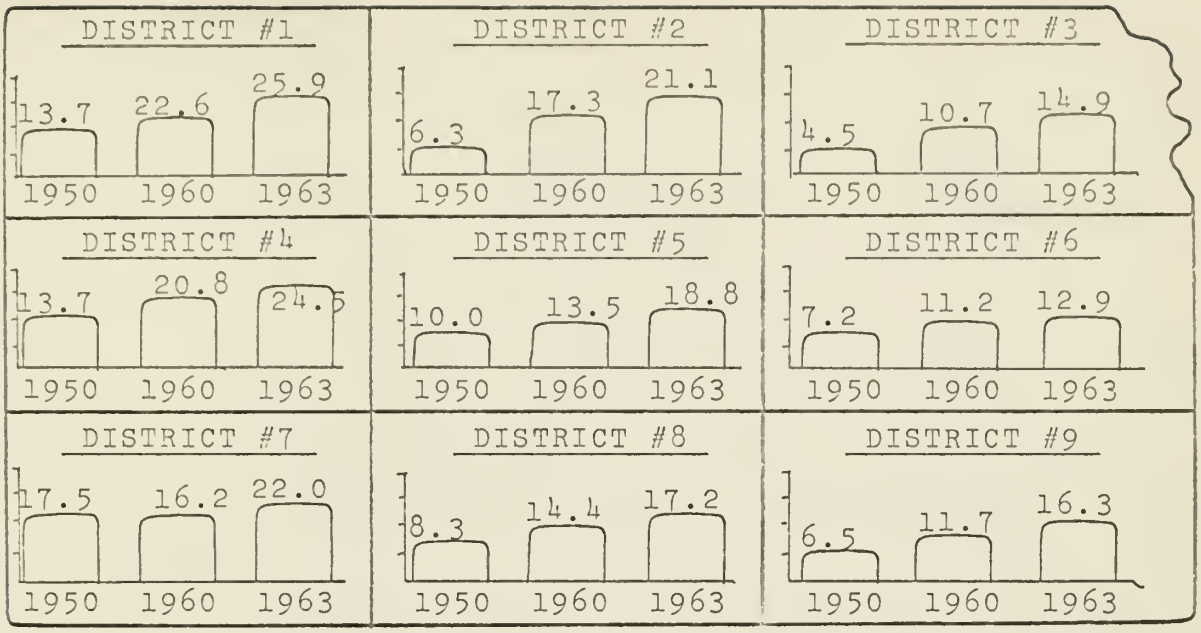

Fig. 38. Y axis scaled 0-30%. District PERCENT OF PRODUCING UNITS in the size category 26 to 50 head, marketing grass-fed cattle for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

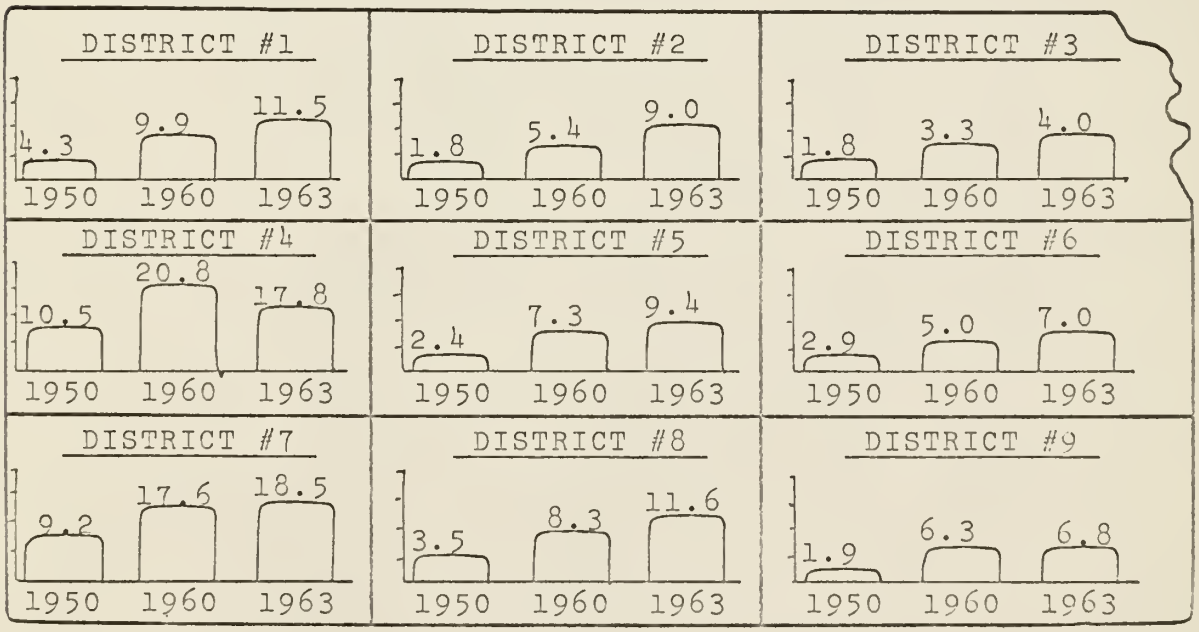

Fig. 39. Y axis scaled 0-25%. District PERCENT OF PRODUCING UNITS in the size category 51 to 100 head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

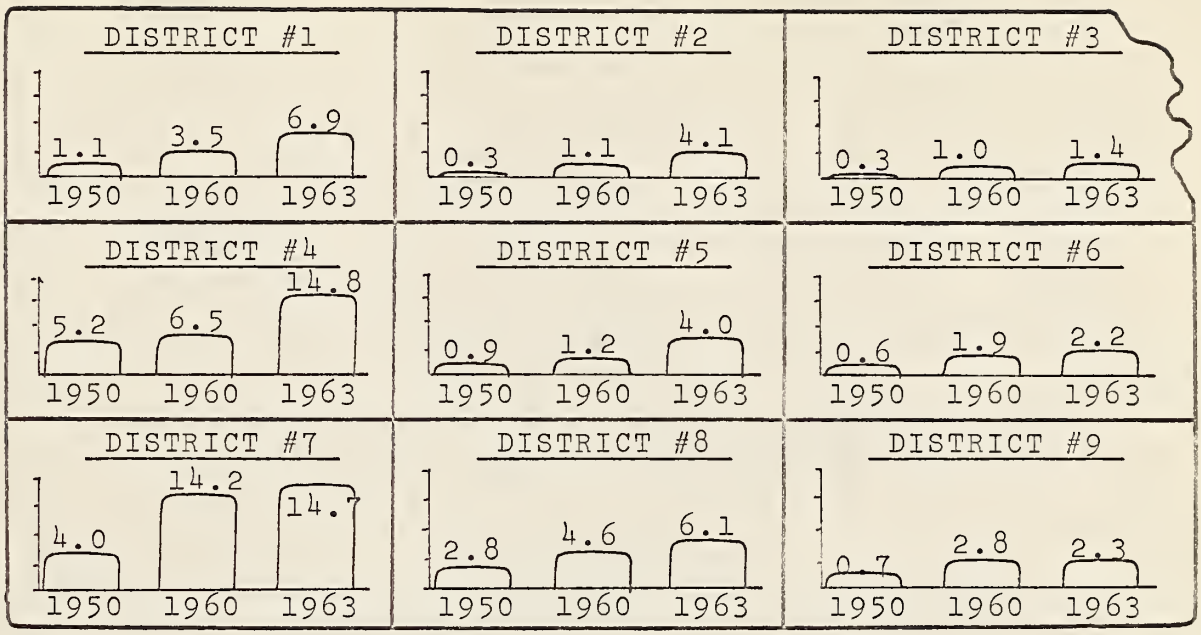

Fig. 40. Y axis scaled 0-15%. District PERCENT OF PRODUCING UNITS in the size category 101 to 200 head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

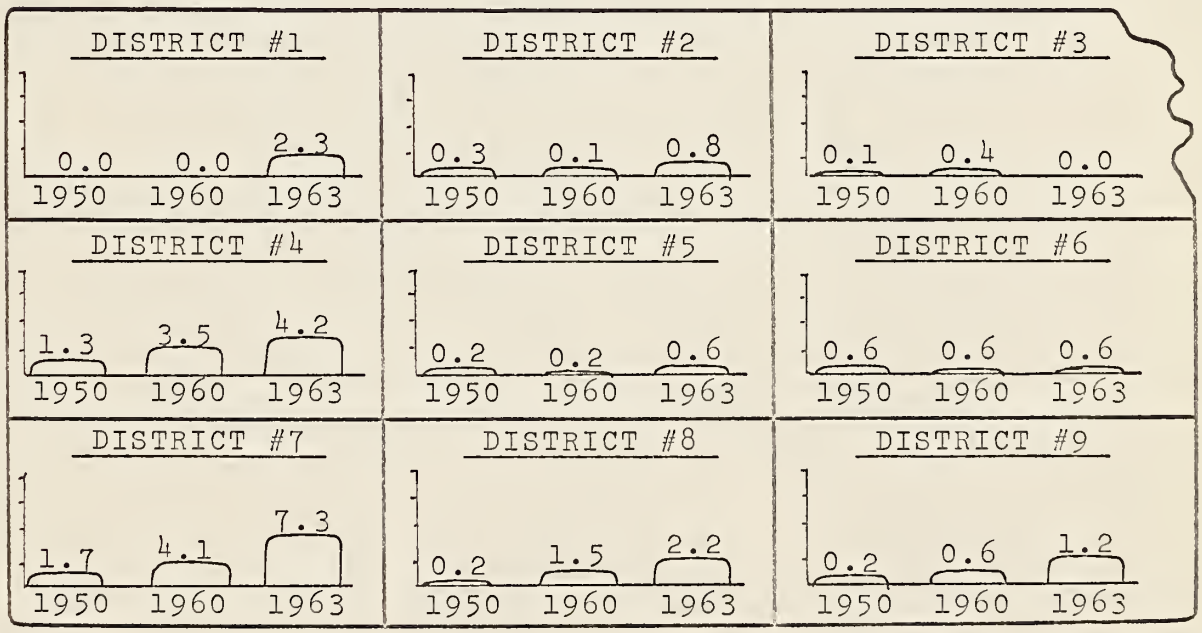

Fig. 41. Y axis scaled 0-10%. District PERCENT OF PRODUCING UNITS in the size category 201 to 399 head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

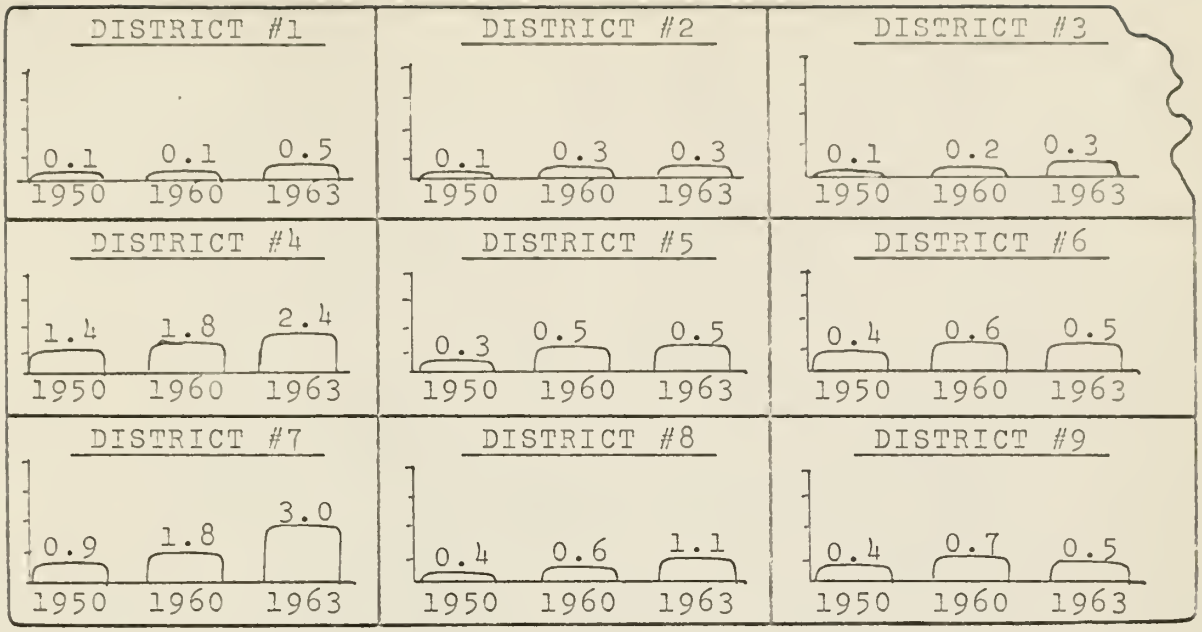

Fig. 42. Y axis scaled 0-5%. District PERCENT OF PRODUCING UNITS in the size category 400 or more head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

The percent of units marketing from 1 to 25 head of cattle has decreased at a faster rate in the western one-third of the state than elsewhere. In comparison with Fig. 7, it is apparent that the percent of producing units marketing from 1 to 25 head of grainfed cattle has decreased at a more rapid rate than the percent of units marketing grassfed cattle in the same size category.

Figure 38 exhibits a definite reverse of the change occurring in the size category 1 to 25 head. Figure 38 shows that the percent of producing units marketing grassfed cattle in the size category 26 to 50 head has increased since 1950 in every district. The rate of increase was comparable across the state averaging twice as high in 1963 as in 1950. It is obvious, however, that the percent of producing units marketing grassfed cattle in the

size category 26 to 50 head was higher in the western one-third of the state than the eastern one-third. The percentage change followed the pattern set by grainfed cattle producers in the size category 26 to 50 head, as can be observed in Fig. 8, however the uniform percentage changes observed in the grassfed picture was not evident in the grainfed cattle producer's picture, particularly in the western one-third of the state.

Figures 39 through 42 all imply increasing trends in the percent of producing units marketing grassfed cattle. State averages, Table 5, suggests that the percent change occurring in the size category 51 to 100 head has tripled since 1950, while the percentage change in producing units in the size category 101 to 200 head increased five fold, from 1 percent in 1950 to 5 percent in 1963. The size categories including 201 or more head likewise display consistant increasing trends.

It is apparent from the preceding discussion that the western one-third of the state is more important in terms of percents of producing units marketing grassfed cattle in the size categories of 26 or more head, whereas the eastern one-third was predominate in the percent of producing units marketing cattle in the size category of 1 to 25 head. The trends which occurred in the grassfed cattle producer's picture in the size categories including 51 or more head were similar to those which occurred in the grainfed cattle producer's picture.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	7th	2nd	2nd	5th	6th	5th	4th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	9th	3rd	3rd	3rd	5th	4th	2nd
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	8th	4th	6th	6th	1st	1st	1st

Fig. 43. Rank of district according to NUMBER OF PRODUCING UNITS in size category 1 to 25 head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figure 43 denotes the change in rank of the number of producing units marketing between 1 and 25 head of grassfed cattle. Refer to Fig. 13 for an explanation of interpreting these figures. It is evident that little change in rank occurred since 1950, and that which did, occurred in the northeastern region of the state. District number nine remained the leading district, for all three years, in the total number of producing units marketing from 1 to 25 head. The western one-third of the state retained ranks 7th, 8th, and 9th. A definite increase in concentration in district numbers three and six is suggested. The areas of concentration of producers in the size category 1 to 25 head lies with districts number two, five, six, and nine.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
6.5	5.5	7th	6.5	1st	1st	9th	7th	6th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	9th	1st	2nd	2.5	4th	5.5	5th
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
5th	9th	8th	2.5	3rd	4th	2.5	4th	2.5

Fig. 44. Rank of districts according to NUMBER OF PRODUCING UNITS in size category 26 to 50 head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas.
Source: County assessor's records.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
7th	8th	8th	8th	6th	3rd	9th	9th	9th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
2nd	3rd	7th	5.5	2nd	2nd	4th	7th	6th
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
2nd	4th	5th	2nd	1st	1st	5.5	5th	4th

Fig. 45. Rank of districts according to NUMBER OF PRODUCING UNITS in size category 51 to 100 head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas.
Source: County assessor's records.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
7th	6th	6th	8th	7.5	4.5	9th	9th	9th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
2nd	4th	3rd	4.5	7.5	4.5	6th	5th	8th
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
3rd	1st	1st	1st	2nd	2nd	4.5	3rd	7th

Fig. 46. Rank of districts according to NUMBER OF PRODUCING UNITS in size category 101 to 200 head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas.
Source: County assessor's records.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	5th	4.5	7.5	6th	8th	6th	9th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
3rd	3rd	3rd	6.5	7.5	7.5	2nd	5th	7.5
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
1st	1st	1st	6.5	2nd	2nd	4.5	4th	4th

Fig. 47. Rank of districts according to NUMBER OF PRODUCING UNITS in size category 201 to 399 head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas.
Source: County assessor's records.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	8th	7th	7th	7th	8th	8th	9th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
1st	2nd	3rd	6th	6th	6th	4th	5th	5th
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
2nd	1st	1st	3rd	3rd	2nd	5th	4th	4th

Fig. 48. Rank of districts according to NUMBER OF PRODUCING UNITS in size category 400 or more head, marketing grassfed cattle for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figure 44 implies that the area of concentration of producers in the size category 26 to 50 head lies in the central one-third of the state, including also district number nine. Less stability of rank over the years, of the districts in Fig. 44, indicates that the changes which occurred in the number of farms producing grassfed cattle in this size category were not proportionally equal among districts. Again district number three's gain in rank reflects increased concentration.

Figure 45 denotes the change in rank of districts concerning the number of producing units, in the size category 51 to 100 head, marketing grassfed cattle. It is evident that the central one-third of the state holds predominance in the number of producing units in the size category 101 to 200 head. Districts

number one, four, six and seven lost rank, while districts number two, five, and eight gained rank. A pattern of change develops as one notes areas of concentration in each size category. As the size categories increase, the area of concentration shifts from a northcentral - eastcentral region down toward the southwest - southcentral area of the state.

Figures 46 and 47 indicate similar patterns. The area of concentration has located itself in the southwest corner of the state, while the northeast area depicts decreasing concentration.

Figure 48 suggests that the southwest area of the state contains the greatest concentration of producing units marketing large numbers (400 or more head) of grassfed cattle. Exhibited also is the fact that the northern one-third of the state represents the area of least concentration of large producers.

Analysis of the Grassfed Cattle Marketings

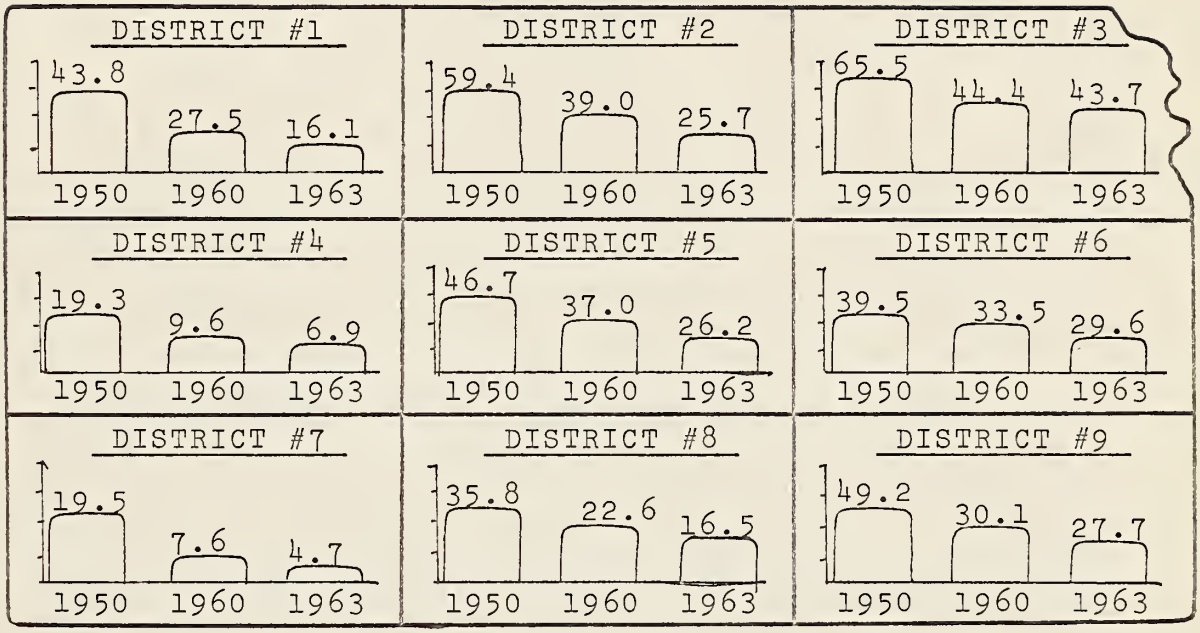

Fig. 49. Y axis scaled 0-75%. District PERCENT OF GRASSFED CATTLE MARKETED by producing units in the size category 1 to 25 head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figures 49 through 54 denote the changes in percent of grassfed cattle marketed by producing units according to size category per district since 1950. Figure 49 points out that in every district the percent of grassfed cattle marketed by producing units in the size category 1 to 25 head per year has decreased since 1950. Apparent also is the fact that the reduction in the percentage of grassfed cattle marketed in the size category 1 to 25 head is higher in the western one-third than the eastern one-third of the state.

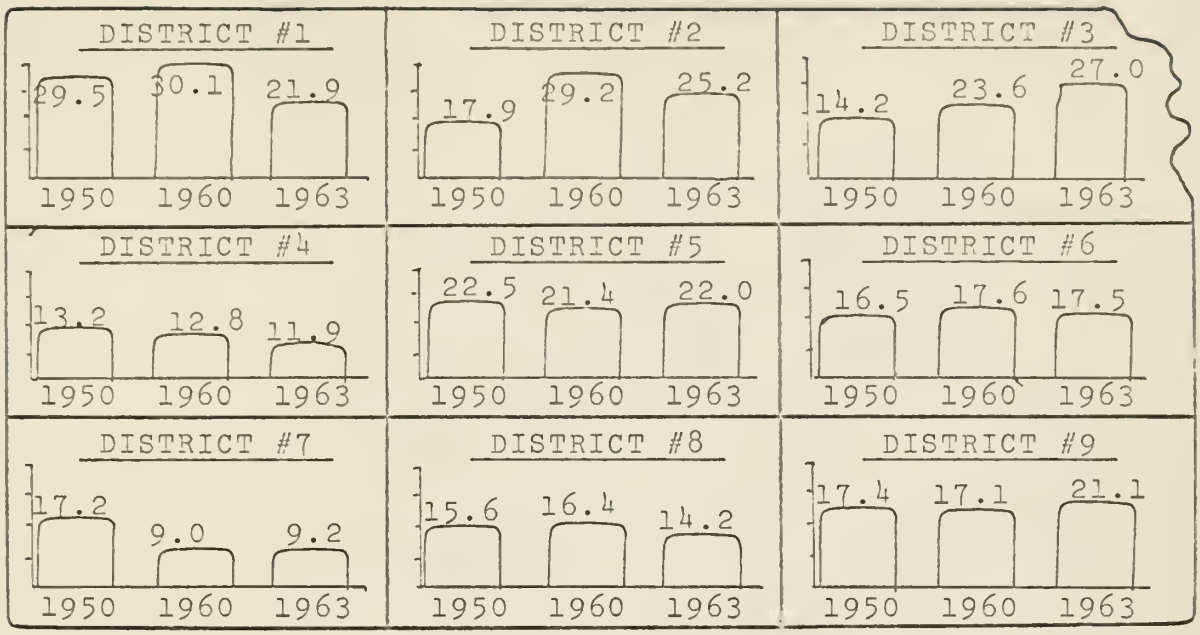

Fig. 50. Y axis scaled 0-30%. District PERCENT OF GRASSFED CATTLE MARKETED by producing units in the size category 26 to 50 head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

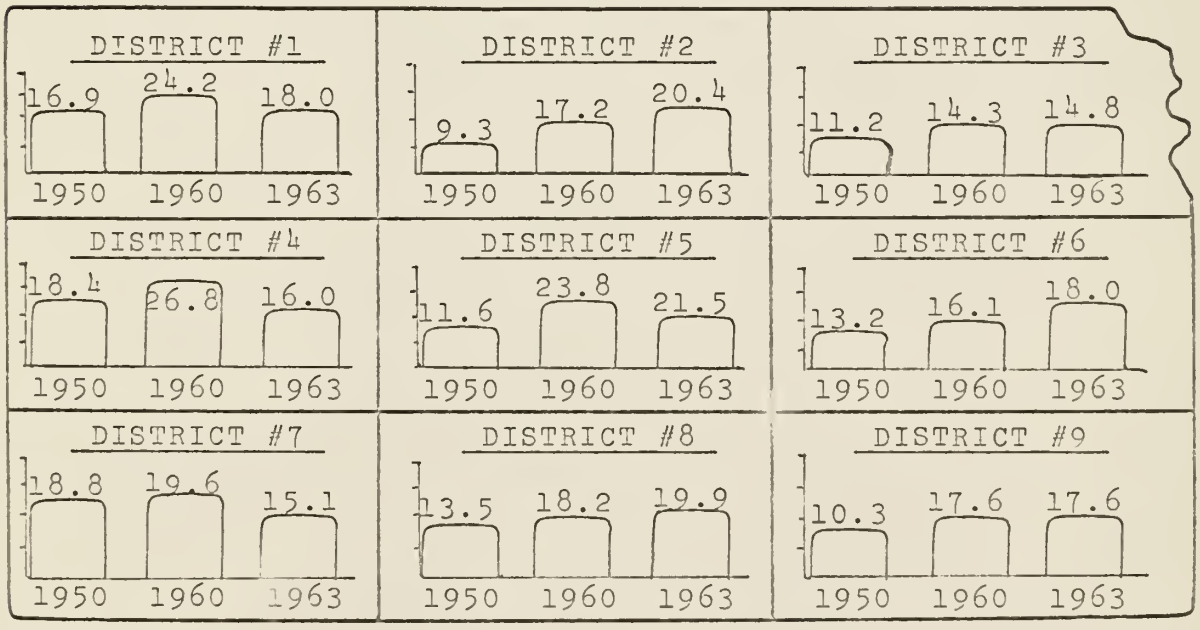

Fig. 51. Y axis scaled 0-30%. District PERCENT OF GRASSFED CATTLE MARKETED by producing units in the size category 51 to 100 head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

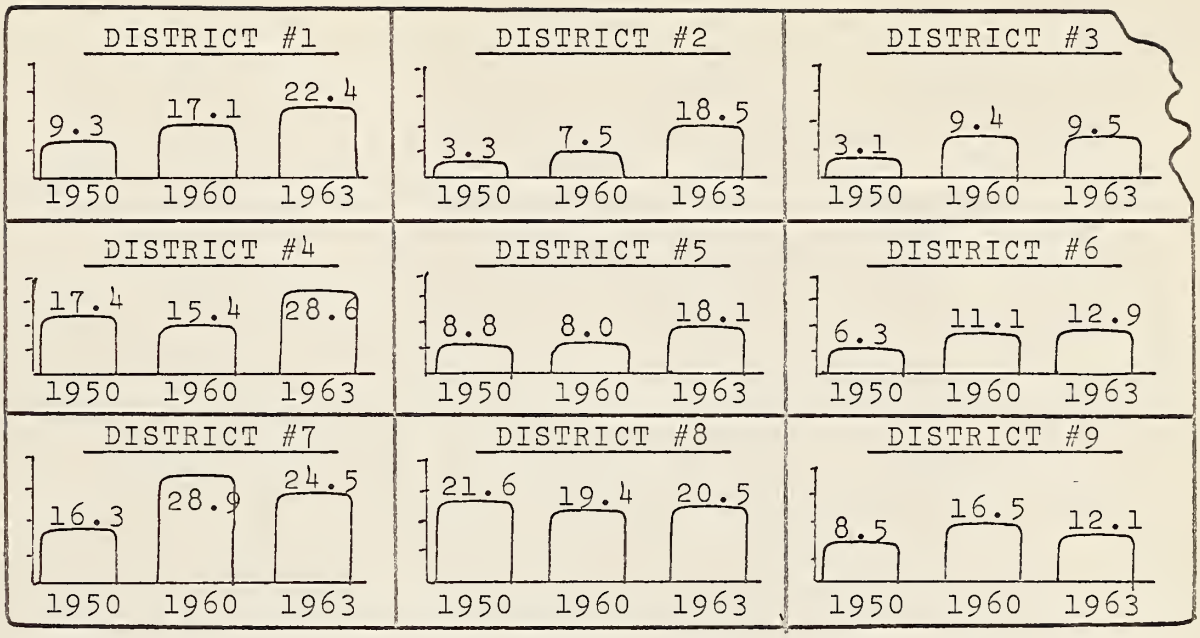

Fig. 52. Y axis scaled 0-30%. District PERCENT OF GRASSFED CATTLE MARKETED by producing units in the size category 101 to 200 head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

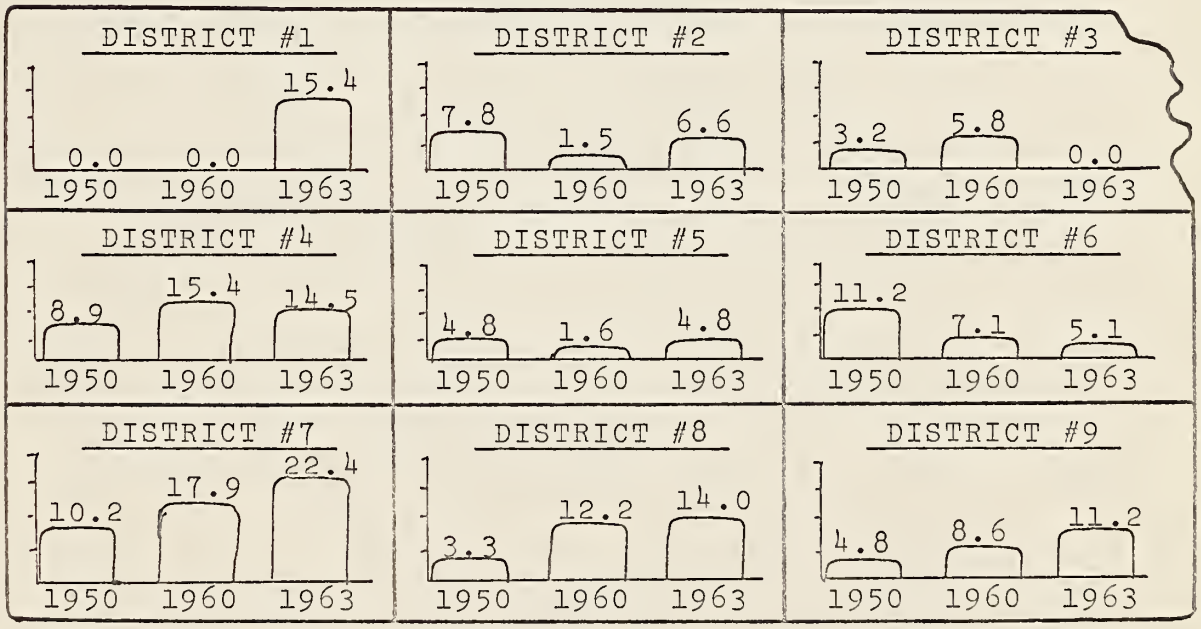

Fig. 53. Y axis scaled 0-25%. District PERCENT OF GRASSFED CATTLE MARKETED by producing units in size category 201 to 399 head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

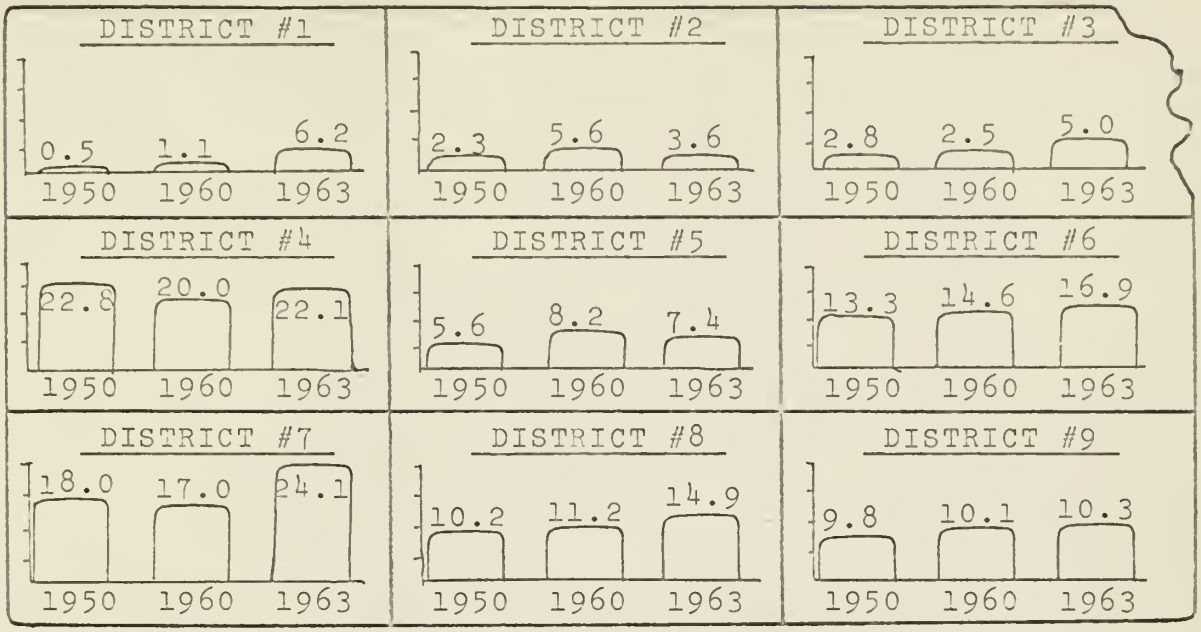

Fig. 54. Y axis scaled 0-25%. District PERCENT OF GRASSFED CATTLE MARKETED by producing units in the size category 400 or more head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

Definitely higher percents of grassfed cattle marketed in this size category occur in the northern one-third of the state than in the southern one-third. This trend carries through Fig. 54.

Figure 50 also gives evidence that the percent of grassfed cattle marketed in the western one-third of the state continues to decrease as we look at the marketings of producing units in the size category 26 to 50 head. However, the eastern one-third of the state records an increasing trend occurring in this size category.

Figures 51 and 52 both denote increasing percents of grassfed cattle marketed across the state by producing units in the size categories 51 to 100 and 101 to 200 head. Figure 51 indicates that the district percentage of grassfed cattle marketed

by producing units in the size category 51 to 100 head are fairly uniform across the state. However, Fig. 52 indicates that higher percents of grassfed cattle were marketed in the size category 101 to 200 head in the western one-third of the state than in the eastern one-third. Also, larger percents are marketed in the southern one-third of the state than the northern one-third. The patterns indicated in this size category were also apparent in the size categories containing 201 or more head, Figures 53 and 54.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	7th	3rd	1st	4th	6th	6th	5th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	8th	2nd	2nd	2nd	5th	4th	3rd
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	9th	4th	5th	6th	1st	3rd	1st

Fig. 55. Rank of districts according to the NUMBER OF GRASSFED CATTLE MARKETED by producing units in the size category 1 to 25 head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figures 55 through 60 indicate rank change in the number of grassfed cattle marketed by producing units in the indicated size categories. Refer to Fig. 30 for an explanation of interpreting these figures.

Figure 55 indicates an area of concentration of producers, in the size category 1 to 25 head of grassfed cattle, extending from northcentral to southeast and eastcentral Kansas. The western one-third of the state registers the lowest ranks (7th, 8th, 9th) while the southeastern region denotes the greatest concentration of producers in this size category.

Figures 56 and 57 indicates that the region of concentration in Fig. 55 has shifted toward the southwest as higher size categories are considered.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
5th	6th	6th	7th	1st	1st	9th	7th	7th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	9th	1st	3rd	2nd	4th	5th	5th
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
6th	9th	8th	2nd	2nd	4th	3rd	4th	3rd

Fig. 56. Rank of districts according to the NUMBER OF GRASSFED CATTLE MARKETED by producing units in the size category 26 to 50 head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
7th	8th	8th	8th	6th	3rd	9th	9th	9th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
3rd	2nd	7th	5th	3rd	2nd	4th	7th	6th
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
1st	4th	5th	2nd	1st	1st	6th	5th	4th

Fig. 57. Rank of districts according to the NUMBER OF GRASSFED CATTLE MARKETED by producing units in the size category 51 to 100 head, for the years, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
7th	6th	6th	8th	8th	5th	9th	9th	9th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
2nd	4th	3rd	5th	7th	4th	6th	5th	8th
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
3rd	1st	1st	1st	2nd	2nd	4th	3rd	7th

Fig. 58. Rank of districts according to the NUMBER OF GRASSFED CATTLE MARKETED by producing units in the size category 101 to 200 head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	5th	4th	8th	6th	8th	6th	9th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
3rd	3rd	3rd	6th	7th	7th	1st	5th	8th
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
2nd	1st	1st	7th	2nd	2nd	5th	4th	4th

Fig. 59. Rank of districts according to the NUMBER OF GRASSFED CATTLE MARKETED by producing units in the size category 201 to 399 head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1			DISTRICT #2			DISTRICT #3		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	7th	7th	7th	8th	8th	8th	9th
DISTRICT #4			**DISTRICT #5**			**DISTRICT #6**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
2nd	2nd	3rd	6th	6th	6th	3rd	4th	4th
DISTRICT #7			**DISTRICT #8**			**DISTRICT #9**		
1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK	1950 RANK	1960 RANK	1963 RANK
1st	1st	1st	4th	3rd	2nd	5th	5th	5th

Fig. 60. Rank of districts according to the NUMBER OF GRASSFED CATTLE MARKETED by producing units in the size category 400 or more head, for the years 1950, 1960, 1963, Kansas. Source: County assessor's records.

District number three ranked 5th in the size category 1 - 25 head, however, in the size categories 51 or more head, it ranks 9th, indicating the area of least concentration of producers in these size categories.

When considering successively higher size categories, the indications are that District number seven increases in concentration, varying from 9th in the size category 1 to 25 head to 1st in the categories of 101 to more head.

The size categories of 101 or more head, denotes the increased concentration of large scale producers, of grassfed cattle in southwest Kansas. This supports the conclusions drawn from Figures 20 to 25. Within distinct rank change over years indicates that the western one-third of the state has increased

in importance in the higher size categories, but has lost rank in the lower three size categories.

Hog Production

Analysis of the Producing Units

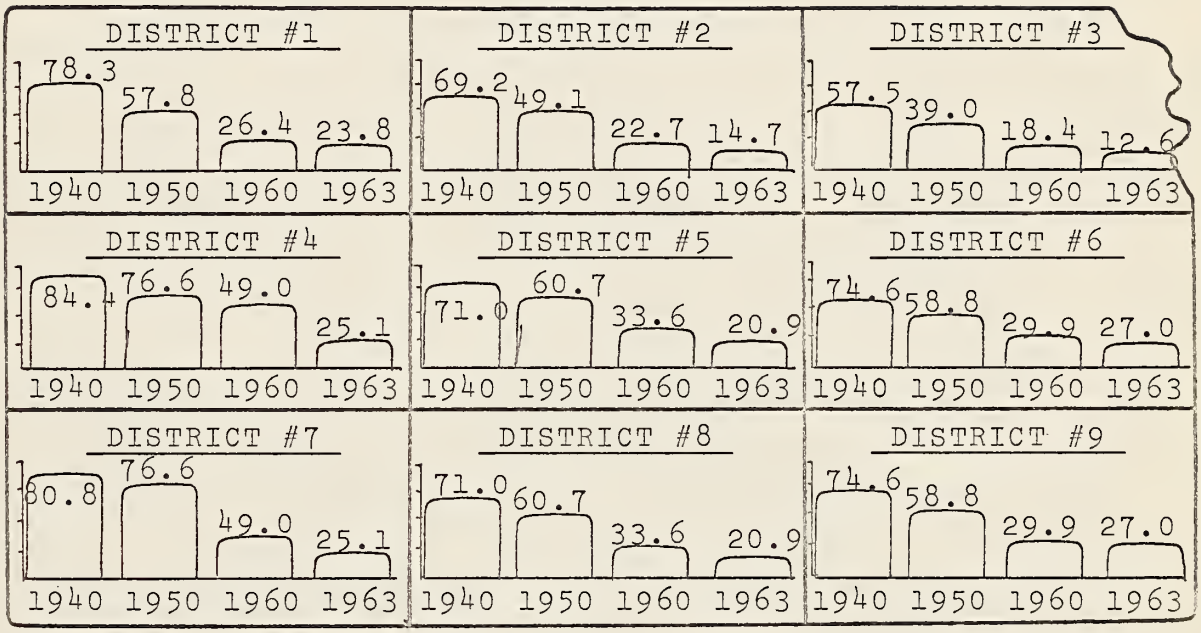

Fig. 61. Y axis scaled 0-100%. District PERCENT OF UNITS producing hogs in the size category 1 to 25 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figures 61 through 66 give evidence of the change that has occurred across the state of Kansas in the percentage of producing units of hogs classified according to six size categories. Figure 61 manifests the picture of the change in the percent of producing units that produced between 1 to 25 hogs. It is evident that the percent of units that produced hogs, in the size category 1 to 25 head, has decreased in all districts of the state since 1940. Figure 61 points out that differences occur across the state in the percentage change.

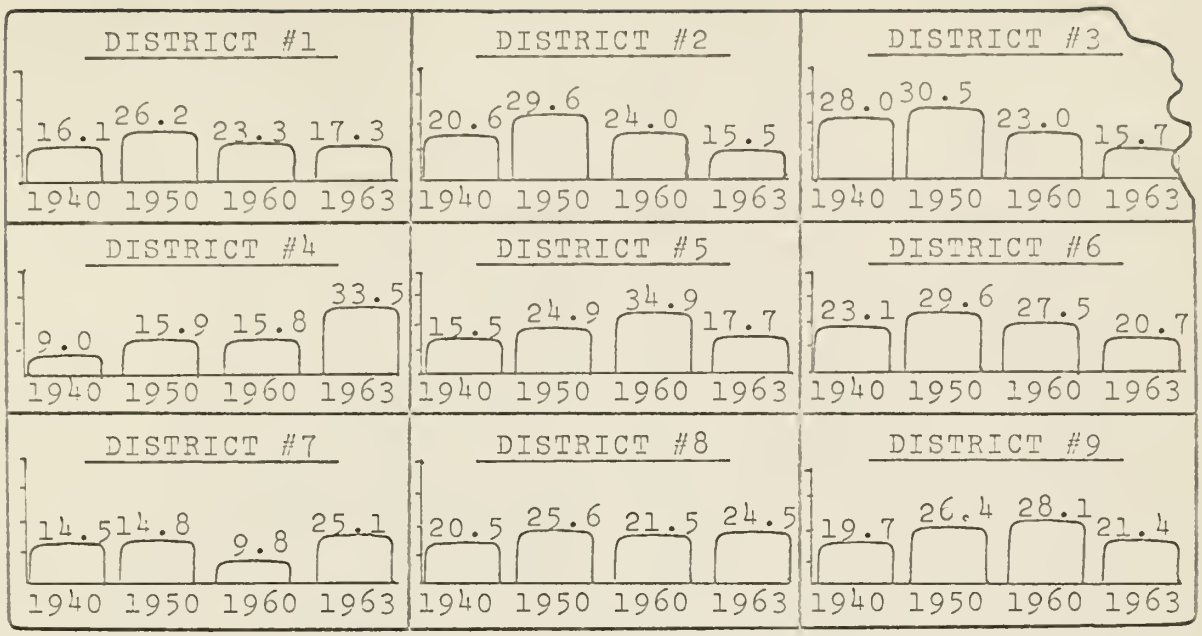

Fig. 62. Y axis scaled 0-50%. District PERCENT OF UNITS producing hogs in the size category 26 to 50 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

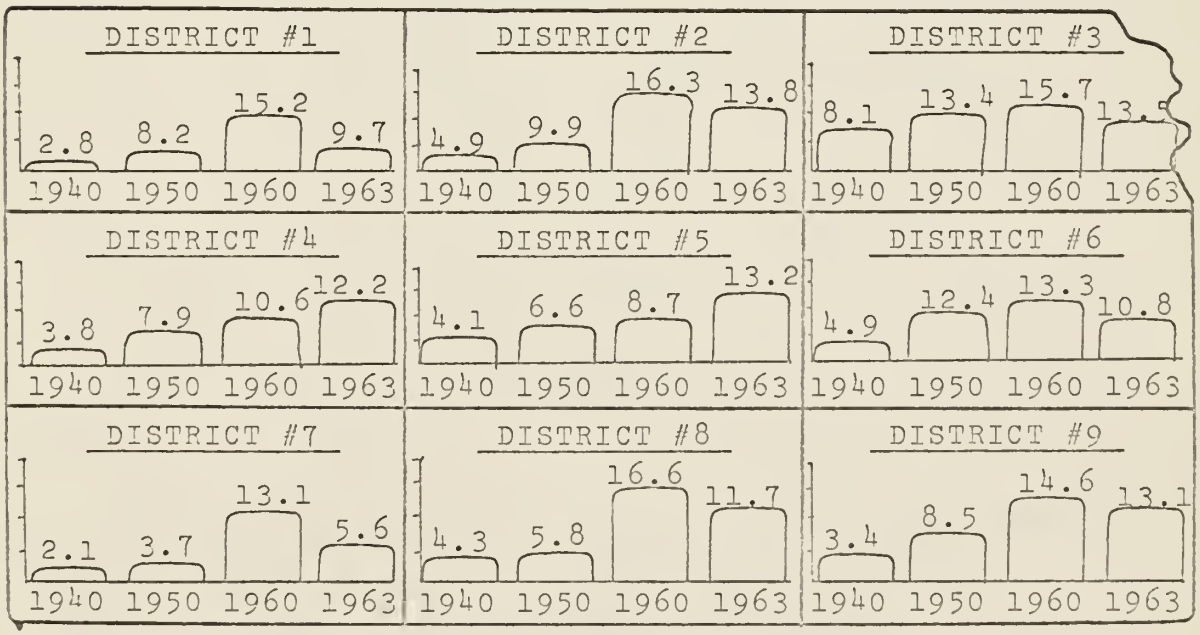

Fig. 63. Y axis scaled 0-20%. District PERCENT OF UNITS producing hogs in the size category 51 to 75 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

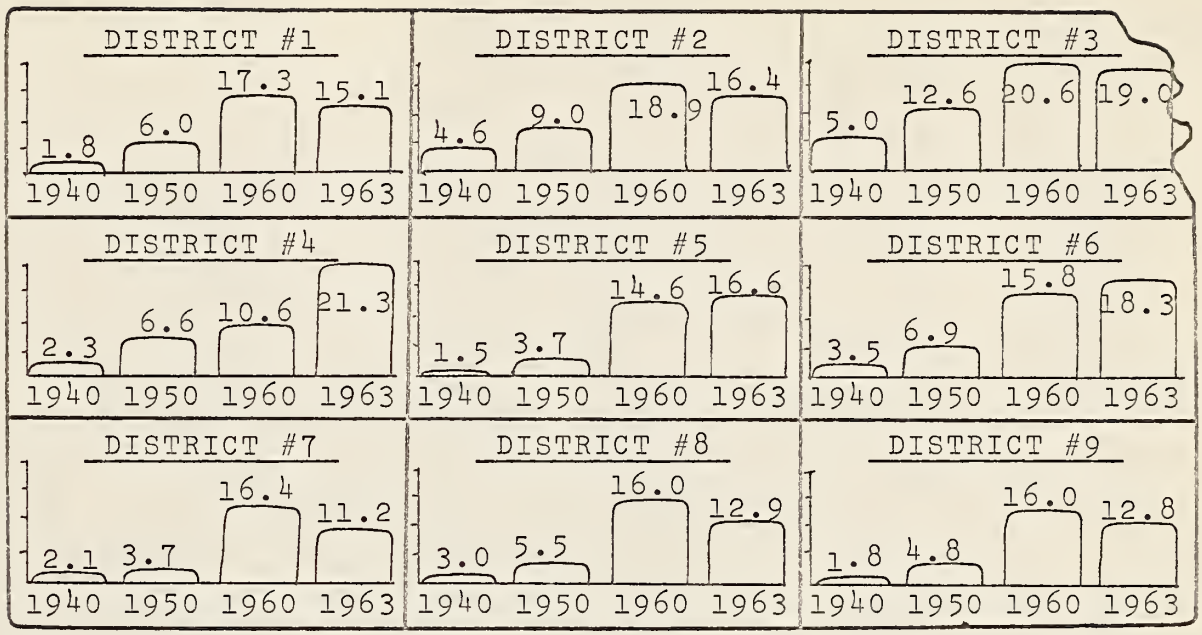

Fig. 64. Y axis scaled 0-20%. District PERCENT OF UNITS producing hogs in the size category 76 to 149 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

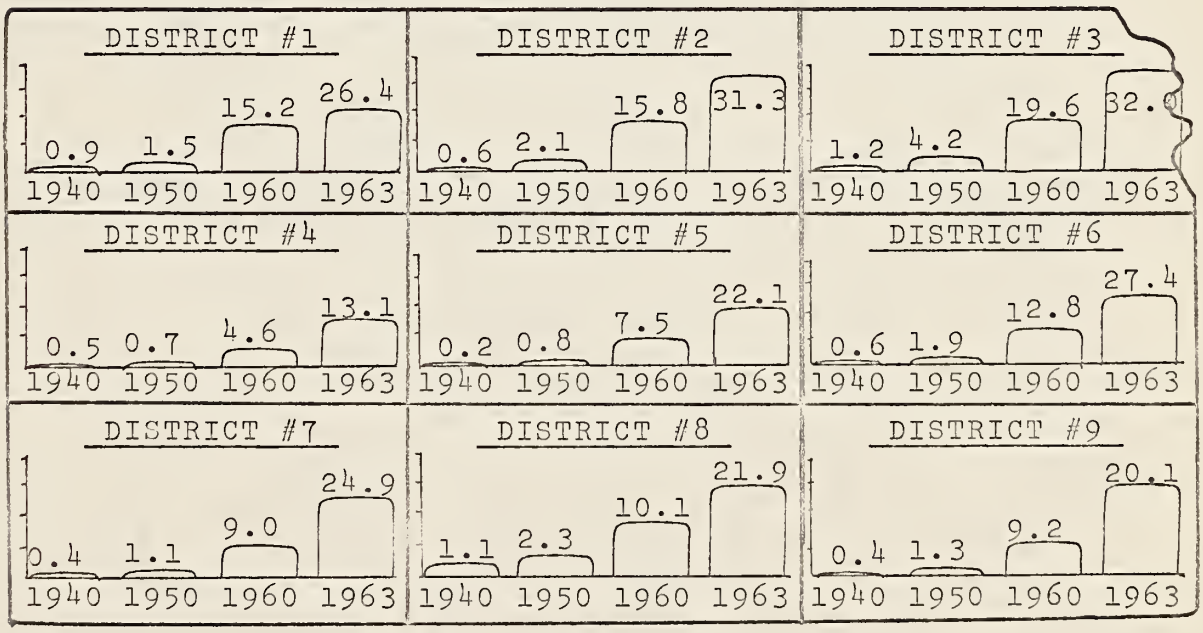

Fig. 65. Y axis scaled 0-35%. District PERCENT OF UNITS producing hogs in the size category 150 to 299 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

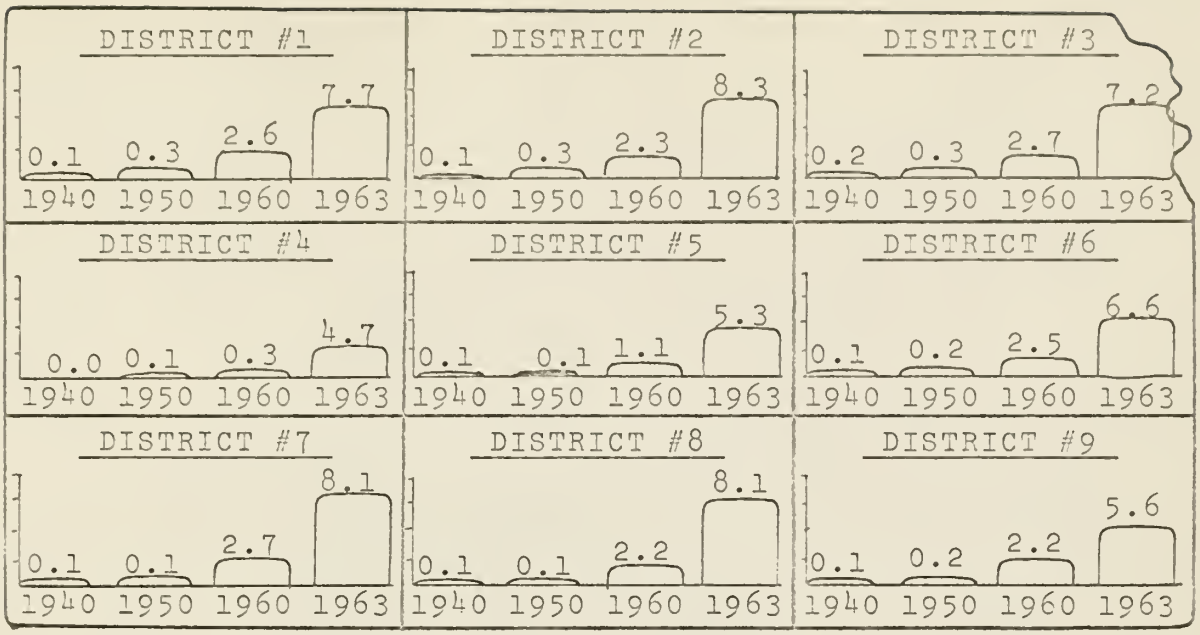

Fig. 66. Y axis scaled 0-10%. District PERCENT OF UNITS producing hogs in the size category 300 or more head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Note the percentage decrease within any one year, as one moves from west to east. In 1940 the western one-third of the state ranged between 78 percent and 84 percent while in the eastern one-third of the state the range was between 57 percent and 75 percent.

Western predominance deminished some each year until in 1963 only the northern one-third of the state denoted western superiority. However, the southern one-third of the state is characterized by the eastern one-third has a higher percent of units producing hogs in the size category 1 to 25 head than the western one-third. This may indicate a change in the picture of future hog production in the state. Figure 61 also suggests that producing units in northeast Kansas have been relatively

unimportant in size category 1 - 25 head.

Figure 62 exhibits considerable change over the years, within districts, in the percent of units producing hogs in the size category 26 to 50 head. A pattern of change occurs from southwest within the state. Note that in district number three (northeast area) the percent of producing units in this size category, since 1940, has decreased each year, while the opposite trend has occurred in districts number four and seven (southwest area). A band of districts from the northwest through the central portion of the state to the southeast area denote increasing and then decreasing trends. An over all view of Fig. 62 would suggest that the importance of the number of producers in this size category is decreasing in the northeastern area of the state, but increasing in the southwestern area. The state average, Table 6, suggests that this size category increased in importance until 1950, but since then has decreased.

Figures 63 and 64 display similar trends. As indicated by the state averages, increasing trends existed in the state until 1960. Since 1960, it is hinted that this trend has begun to reverse so that in 1963 a downward trend occurred. The downward trend is more apparent in Fig. 63 than Fig. 64. No definite differences between percents occur across the state in these two figures.

Figures 65 and 66 will also be discussed together. State averages in Table 6 show that size categories of 150 or more head are increasing in importance. All districts in these two figures

denote increasing trends. The increase in percent of units producing hogs in these size categories has been great. It is apparent that the size category 150 to 299 head has greatly increased in importance since 1940, with the area of greatest importance being in northeastern Kansas.

The size category 300 or more head likewise denotes considerable increase in importance in the percent of units producing large numbers of hogs. As can be seen from the state average in Table 6, a tremendous rate of growth in the percent of producers in this size category has occurred since 1940. Figure 66 presents a uniform increase in percents, among the districts of producing units in the size category of more than 300 head.

Figures 61 through 66 suggest some interesting trends. As was pointed out, the percent of producers in the size category 1 to 25 head has steadly decreased since 1940, indicating decreasing importance of this size category of producers. The size category 26 to 50 head reached its peak importance in 1950 and has decreased since that time. Size categories 51 to 75 and 76 to 149 both reached peaks in 1960, with the size category 51 to 75 head indicated a greater reduction than the size category 76 to 149 head in 1963. Categories 149 to 300 and greater than 300 head both have increased at an increasing rate since 1940. This suggests the trend since 1940 towards an increasing percent of large scale producers of hogs.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	7th	7th	4th	4th	4th	4th	3rd	3rd	3rd	2nd
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	8th	9th	6th	6th	6th	5th	2nd	2nd	1st	3rd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	9th	8th	5th	5th	5th	6th	1st	1st	2nd	1st

Fig. 67. Rank of districts according to NUMBER OF PRODUCING UNITS in the size category 1 to 25 producing hogs for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figures 67 through 72 indicate the change in rank that has occurred since 1940 in terms of the total number of units producing hogs in the size category under observation. Refer to Fig. 13 for an explanation interpreting Figures 67 through 72.

The figures here under study exhibit the fact that in every size category little change in rank has occurred between districts since 1940 concerning the number of units producing hogs. This implies that essentially no change in concentration, between districts of producers within size categories, has occurred. Figures 61 through 66 indicated percentage changes which have occurred within districts between size categories, but gave no evidence of change between districts within size categories.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	7th	7th	4th	4th	4th	4th	1st	1st	1st	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	8.5	8th	8th	6th	6th	5th	6th	2nd	2nd	2nd	2nd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8.5	9th	9th	5th	5th	6th	5th	3rd	3rd	3rd	3rd

Fig. 68. Rank of districts according to NUMBER OF PRODUCING UNITS in the size category 26 to 50 producing hogs for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	7th	7th	4th	3rd	2nd	2nd	1st	1st	1st	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	8.5	8th	6th	5th	6th	5th	2nd	2nd	3rd	3rd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	8.5	9th	5th	6th	5th	6th	3rd	4th	4th	4th

Fig 69. Rank of distirct according to NUMBER OF PRODUCING UNITS in the size category 51 to 75 producing hogs for the years 1940, 1950, 1960, 1963, Kansas. Source County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	7th	7th	3rd	2nd	2nd	3rd	1st	1st	1st	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8.5	8th	9th	8th	6th	6th	6th	5th	2nd	3rd	3rd	2nd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8.5	9th	8th	9th	5th	5th	5th	6th	4th	4th	4th	4th

FIG. 70. Rank of districts according to NUMBER OF PRODUCING UNITS in the size category 76 to 149 producing hogs for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
6th	6th	7th	7th	4th	3rd	2nd	2nd	1st	1st	1st	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8.5	8.5	9th	9th	7th	7th	6th	5th	2nd	2nd	3rd	3rd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8.5	8.5	8th	8th	3rd	5th	5th	6th	5th	4th	4th	4th

Fig. 71. Rank of district according to NUMBER OF PRODUCING UNITS in the size category 150 to 299 producing hogs for the years 1940, 1950, 1960, 1963, Kansas Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
5th	5th	6th	7th	6th	2nd	3.5	2nd	1st	1st	1st	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	8th	9th	9th	7.5	8th	7th	6th	2nd	4th	2nd	3rd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7.5	8th	8th	8th	4th	6th	5th	5th	3rd	3rd	3.5	4th

Fig. 72. Rank of districts according to NUMBER OF PRODUCING UNITS in the size category 300 or more producing hogs for the years 1940, 1950, 1960, 1963, Kansas. Source: Count assessor's records.

Bearing in mind that changes in concentration over the years 1940 to 1963, between districts, has been slight within size categories. Attention will now be called to the importance of areas of state as related to the different size categories of producers.

Figure 67 denotes the fact that the southeast region (District number nine) ranks first in the numbers of units producing hogs in the size category 1 to 25 head. The eastern one-third of the state retains ranks 1st, 2nd, and 3rd, while the western one-third reserves ranks 7th, 8th, and 9th. Figure 68 indicates a reversing of ranks, as compared with Fig. 67, between Districts number three and nine. The western two-thirds of the state remained relatively the same in terms of rank.

Figures 69 and 70 denote district number nine losing rank as compared with Figures 67 and 68 while District number two is increasing rank. This change in rank, as the size category increases, suggests that the importance of the district is likewise changing. Thus it can be said that District number nine decreases in concentration as larger size categories, of producing units are considered, whereas the northcentral and northeastern regions increase in concentration. This trend is continued in the size categories 150 or more head, denoted by figures 71 and 72. Therefore as the size category increases, the area of concentration of producers in each successive size category shifts from the southeast to the north and northcentral. West and southwest Kansas denotes the area of least concentration in all size categories of producing units.

Analysis of the Hogs Produced

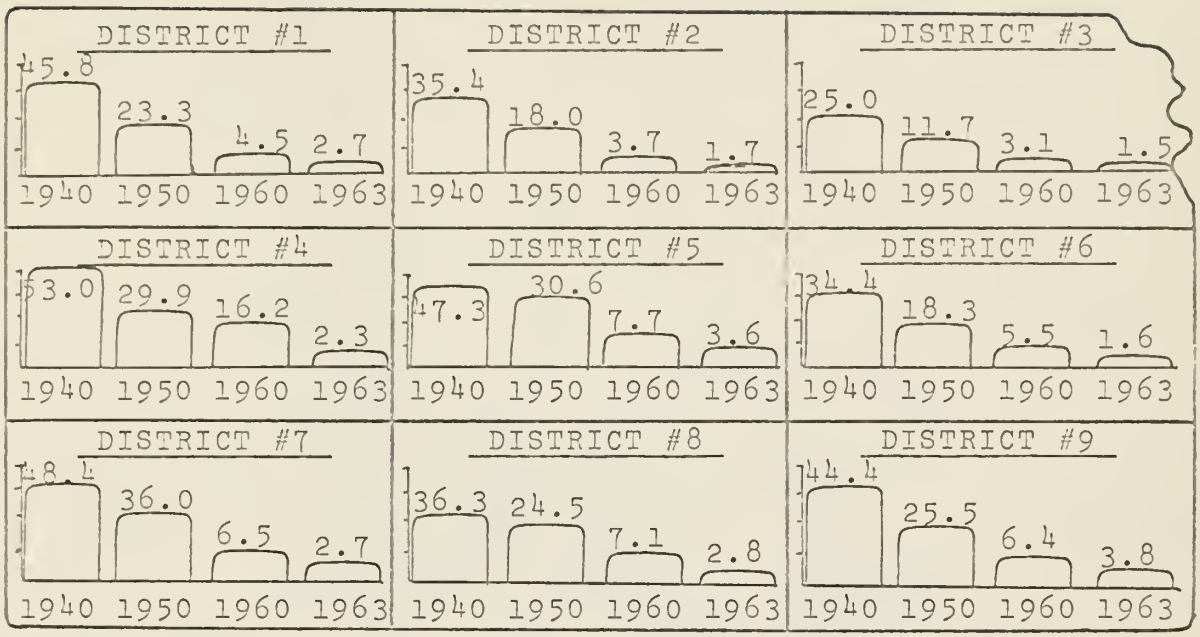

Fig. 73. Y axis scaled 0 - 55%. District PERCENT OF HOGS PRODUCED by UNITS in size category 1 to 25 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figures 73 through 78 give evidence of changes in the percent of hogs produced, within districts, by units classificated according to size categories since 1940. For example in 1940, 46 percent of the hogs produced in district number one were produced by units in the size category 1 to 25 head. State averages presented in Table 6 point out that the percent of hogs produced by units in the size categories 1 to 25 and 26 to 50 head has decreased since 1940. Figure 74 shows a decreased trend, but the trend decreased at a slower rate than did the trend in Fig. 73.

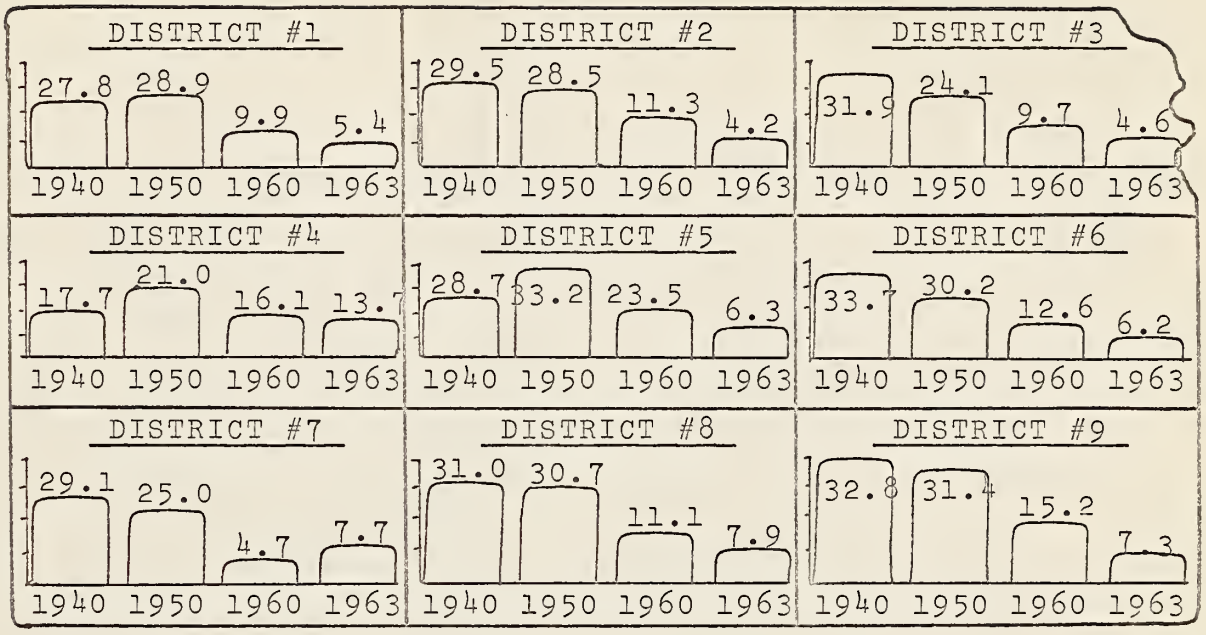

Fig. 74. Y axis scaled 0 - 35%. District PERCENT OF HOGS PRODUCED by UNITS in size category 26 to 50 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

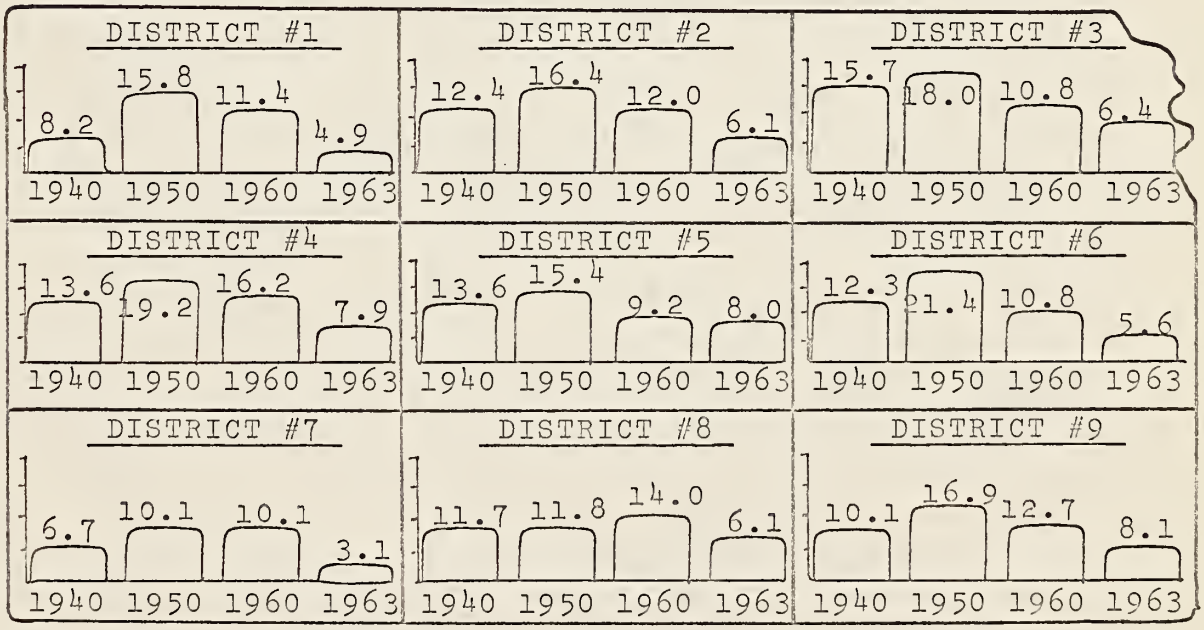

Fig. 75. Y axis scaled 0 - 25%. District PERCENT OF HOGS PRODUCED by UNITS in size category 50 to 75 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

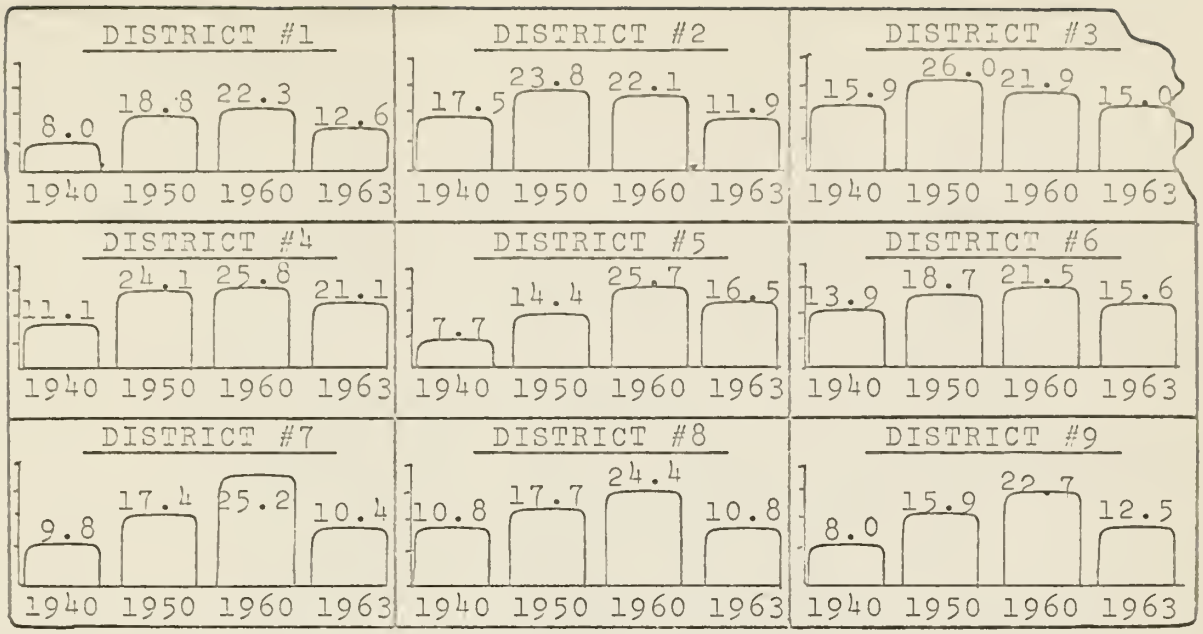

Fig. 76. Y axis scaled 0 - 30%. District PERCENT OF HOGS PRODUCED by UNITS in size category 76 to 149 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

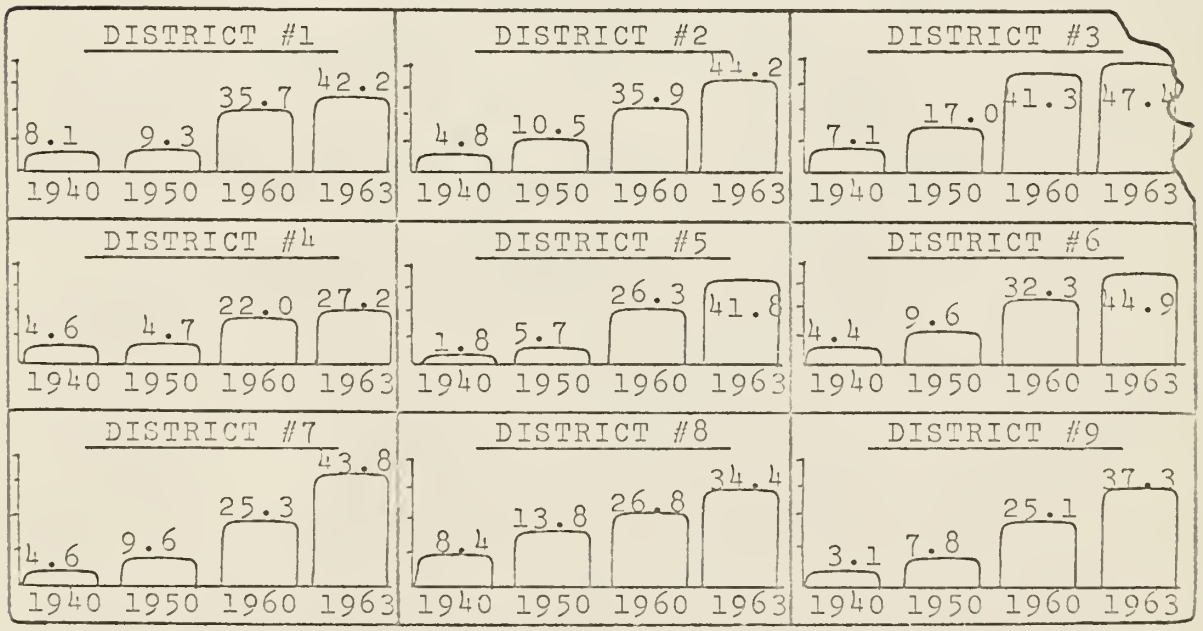

Fig. 77. Y axis scaled 0 - 50%. District PERCENT OF HOGS PRODUCED by UNITS in size category 150 to 299 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

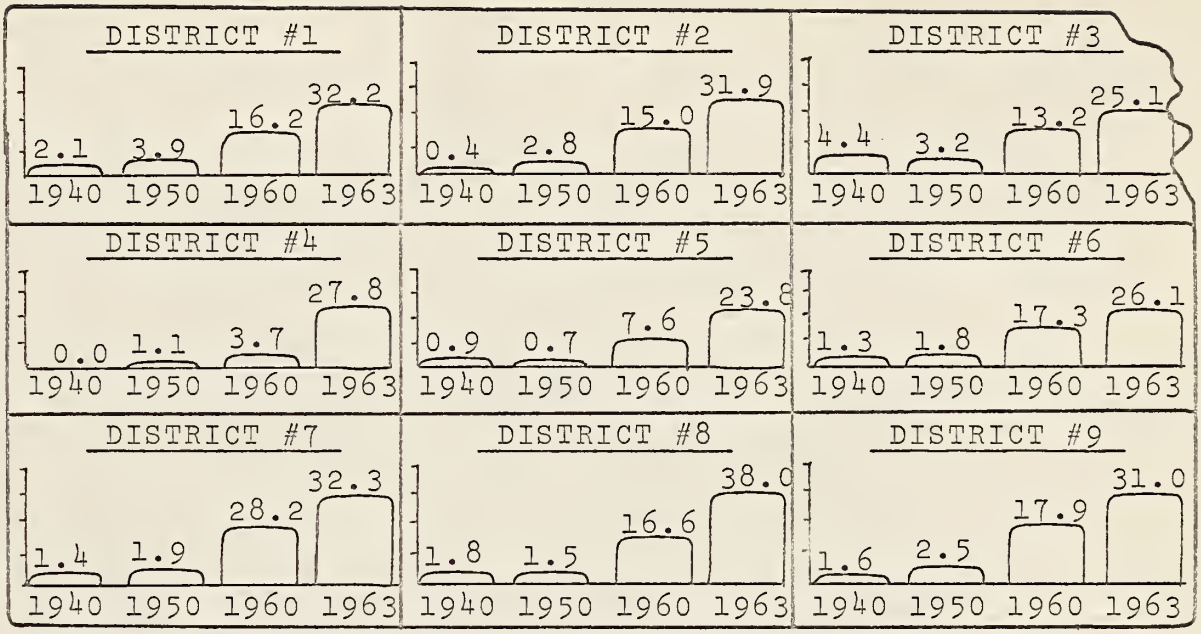

Fig. 78. Y axis scaled 0 - 50%. District PERCENT OF HOGS PRODUCED by UNITS in size category 300 or more head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figure 73 indicates that the rate of decrease has been more rapid in the western one-third of the state than in the eastern one-third. Recalling the location of the areas of high concentration of hog producing units, presented in Figures 61 to 66, explains the difference in rate of percentage change. The western one-third of the state contained the least number of producing units, therefore, a reduction in their numbers would depict a greater percentage change than a similar reduction in an area of higher concentration.

Figures 75 and 76 exhibit increasing and then decreasing trends. The trends vary about the same across the state. It is obvious that a pattern is set, as was observed with data concerning the percent of hogs producing units in Figures 69

and 70. The percent of hogs produced within the size categories 51 to 75 and 76 to 149 reached a peak in 1950 and 1960 respectively and then began to drop off. It is obvious that a time lag of ten years occurred between the peaks in Figures 75 and 76. This data cannot indicate that this is the maximum difference or whether the actual peaks occurred in years than 1950 and 1960.

Figures 77 and 78 depict the increasing percents of hogs being produced by large scale units. However, the rate of gain in the larger size category was more rapid between 1950 and 1963, indicating that the size category more than 300 head is becoming increasingly more important.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	7th	7th	4th	4th	4th	3rd	3rd	3rd	2nd	2nd
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	9th	8th	9th	6th	5th	6th	5th	2nd	2nd	1st	4th
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	8th	9th	8th	5th	6th	5th	6th	1st	1st	3rd	1st

Fig. 79. Rank of districts according to NUMBER OF HOGS PRODUCED by UNITS in the size category 1 to 25 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Figures 79 through 84 indicate changes in concentration among the nine districts in Kansas in terms of the numbers of hogs produced by units classified according to size categories. The procedure ranks the district which produced the greatest number of hogs, by units in the indicated size category, as 1st and the district with the lowest number of hogs produced that year as 9th. Refer to Fig. 30 for an explanation of the interpretation of Figure 79 through 84.

As was shown in Figures 67 through 72, Figures 79 through 84 also exhibit the fact that within each size category, very little change in rank has occurred between districts since 1940 concerning the number of hogs produced.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	7th	7th	4th	4th	4th	4th	1st	1st	1st	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	8th	8th	6th	6th	5th	6th	2nd	2nd	2nd	2nd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	9th	9th	5th	5th	6th	5th	3rd	3rd	3rd	3rd

Fig. 80. Rank of districts according to NUMBER OF HOGS PRODUCED by UNITS in the size category 26 to 50 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	6th	7th	4th	3rd	2nd	2nd	1st	1st	1st	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	8th	8th	6th	5th	7th	5th	2nd	2nd	3rd	4th
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	9th	9th	5th	6th	5th	6th	3rd	4th	4th	3rd

Fig. 81. Rank of districts according to NUMBER OF HOGS PRODUCED by UNITS in the size category 51 to 75 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
7th	7th	7th	7th	3rd	2nd	2nd	3rd	1st	1st	1st	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	9th	8th	6th	6th	6th	5th	2nd	3rd	3rd	2nd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	8th	9th	5th	5th	5th	6th	4th	4th	4th	4th

Fig. 82. Rank of districts according to NUMBER OF HOGS PRODUCED by UNITS in the size category 76 to 149 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
6th	6th	7th	7th	4th	3rd	2nd	2nd	1st	1st	1st	1st
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	9th	9th	9th	7th	7th	6th	5th	2nd	2nd	3rd	3rd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	8th	8th	8th	3rd	5th	5th	6th	5th	4th	4th	4th

Fig. 83. Rank of districts according to NUMBER OF HOGS PRODUCED by UNITS in the size category 150 to 299 head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's recrods.

DISTRICT #1				DISTRICT #2				DISTRICT #3			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
5th	5th	6th	7th	7th	3rd	4th	1st	1st	1st	1st	2nd
DISTRICT #4				**DISTRICT #5**				**DISTRICT #6**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
9th	8th	9th	9th	6th	7th	7th	6th	3rd	4th	2nd	3rd
DISTRICT #7				**DISTRICT #8**				**DISTRICT #9**			
1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK	1940 RANK	1950 RANK	1960 RANK	1963 RANK
8th	9th	8th	8th	4th	6th	5th	5th	2nd	2nd	3rd	4th

Fig. 84. Rank of districts according to NUMBER OF HOGS PRODUCED by UNITS in the size category 300 or more head, for the years 1940, 1950, 1960, 1963, Kansas. Source: County assessor's records.

Taken together, Figures 67 to 72 and 79 to 84 strengthen the argument that essentially no change in the concentration of hog production has occurred. Therefore, attention will be focused on the concentration of areas of the state as related to the different size categories of producers.

Figure 79 denotes district number nine as the area of greatest concentration in the number of hogs produced by units in the size category 1 to 25 head. The eastern one-third of the state was definitely predominate in the number of small scale operations, while the western one-third ranked lowest. The picture presented by Fig. 80 is similar to that presented by Fig. 79, except districts number three and nine have reversed rank. District number three retained its rank of 1st throughout, the remaining size categories.

Figures 81, 82, 83, and 84 all denote the same trends; a shifting of concentration from southeast to northeast and northcentral, as the size categories are increased. Figure 84 implies that a definite trend toward increased concentration has occurred in district number two since 1940 while district number nine became less concentrated. The trend toward increased concentration in district number two is apparent in Fig. 81 also. This would indicate that the central portion of the north one-third of the state has increased in concentration in the total number of hogs produced by large scale units, those that produce more than 150 hogs per year.

CHAPTER V

SUMMARY

Tables 4, 5, and 6 pages 25, 26, and 27 denote and overall summary picture of the state trends occurring in the changing importance of the size categories of producing units and of the livestock marketed by these producing units.

The state changes observed in Tables 4, 5, and 6, give background to the following section which summarizes the changes which have occurred among districts in the concentration of livestock production. Definite decreasing trends have occurred, since 1940, in the percent of producing units and in the percent of grainfed cattle marketed in all districts of Kansas in the 1 to 25 head size category, while slightly decreasing trends occurred for size categories 51 to 100 and 101 to 200 head. Size category 201 to 399 head exhibited marked increasing trends in concentration in the northern one-third of the state and erratic changes elsewhere in the state. The size category of grainfed cattle marketed by producing units of 400 or more head has experienced considerable growth in both numbers and percents.

The growth in percent of grassfed cattle, marketed by large scale producers, has occurred to the greatest extent in the south-western area of the state. However, as was noted in Fig. 29, this large percentage was accounted for by a very small fraction of the total number of producing units.

The northern one-third of the state exhibited trends toward increased concentration in all size categories from 26 to 399 head. District number nine (South-east Kansas) indicates a pronounced reduction in concentration of grassfed cattle produced.

The percents of grassfed cattle marketed and of units producing grassfed cattle indicate that larger portions of the small producers were located in the northern and eastern regions of the state, whereas the larger producers in size categories 101 or more head were located in the southern and western regions of the state. The percents of grassfed cattle marketed by producing units in size category 1 to 25 head decreased while increased importance for the larger size categories is denoted.

The change in concentration of producers of grassfed cattle has been small within size categories. However, there is a definite pattern of location or concentration of producers according to size category. As the size category increases, the area of concentration of producers shifts southward and westward. This manifests the picture that the greatest concentration of large scale producers of grassfed cattle are located in southwest Kansas, while the smaller producing units are located in the northeastern region of the state.

The changes in percent of hogs produced and of units producing hogs indicate that the small size categories, 1 to 75 head, are becoming relatively less important, while the large scale units of production have increased tremendously. This change has been fairly uniform across the state. Definite

patterns were apparent which denoted the trend, since 1940, toward increasing importance of the large scale production units.

The ranking of districts, by years, denoted no definite changes in concentration of hog production within size categories. However, definite patterns were set as to the importance of areas of the state relating to concentration of the different size categories of producing units. Producers in size category 1 to 25 head were predominant in the southeastern region of the state. The change in concentration of the producing units shifted from southeast to northeast and north central Kansas as larger size categories of producing units were observed. The primary concentration of large scale producing units and of numbers of hogs produced is located in the northeast and north central region of the state, with the western one-third of the state recognized as the area of least concentration in all size categories.

BIBLIOGRAPHY

Books

Cochran, William G. Sampling Techniques Second Edition, John Wiley and Sons, Incorporated, New York, 1965.

Moore, John R., and Walsh, Richard G. Market Structure of the Agricultural Industries. Iowa State University Press, Ames, Iowa, 1966.

Bulletins and Publications

Co-operative Extension Service. "The Economics of Cattle Feeding." Montana State College, Special Report No. 1, September, 1961.

Finley, Robert M., and Johnson, Ralph D. "Changes in the Cattle Feeding Industry in Nebraska." Nebraska Agricultural Experiment Station, S.B.-476, March, 1963.

Hopkin, John A., and Kramer, Robert C. "Cattle Feeding in California." Bank of America, Economic Research Department, February, 1965.

Maki, Wilbur, and Schreiner, Dean F. "Regional Intersectoral Relations and Demand Projections with Emphasis on the Feed-livestock Economy of the North Central States." Agriculture Experiment Station, Iowa State University, Research Bulletin No. 530, December, 1964.

McCoy, John H., and Wuhrman, Robert H. "Some Economic Aspects of Commercial Cattle Feeding in Kansas." Agriculture Experiment Station, Kansas State University, Bulletin 424, June, 1960.

McCoy, John H., and Wakefield, H.D. "Economics of Scale in Farm Cattle Feedlots of Kansas -- An Analysis of Nonfeed Costs." Agriculture Experiment Station, Kansas State University, Technical Bulletin 145, January, 1966.

Newberg, Richard R. "Livestock Marketing in the North Central Region, Where farmers and Ranchers Buy and Sell." Ohio Agricultural Experiment Station, North Central Regional Publication 104, December, 1959.

Nordquist, Arnold, and Ottoson, Howard. "The Beef Cycle." Nebraska Agriculture Experiment Station, E.C. 65-827, October, 1965.

North Central Extension Marketing Committee. "Hog Marketing in the North Central States." Co-operative Extension Service, Iowa State University, North Central Regional Publication No. 10, Pamphlet 263, March, 1960

BIBLIOGRAPHY
CONTINUED

United States Department of Commerce. United States Census of Agriculture: 1959, Kansas. Vol. I, Part 21, United States Government Printing Office, Washington, D.C., 1961.

United States Department of Commerce. United States Census of Agriculture: 1954, Kansas. Vol. I, Part 13, United States Government Printing Office, Washington, D.C., 1956.

United States Department of Commerce. United States Census of Agriculture: 1950, Kansas. Vol. I, Part 13, United States Government Printing Office, Washington, D.C., 1951.

United States Department of Commerce. United States Census of Agriculture: 1945, Kansas. Vol. I, Part 13, United States Government Printing Office, Washington, D.C., 1946.

United States Department of Commerce. United States Census of Agriculture: 1940, Kansas. Series I, United States Government Printing Office, Washington, D.C., 1941.

Periodicals and Journals

Clodius, Robert L., and Nueller, Willard F. "Market Structure Analysis as an Orientation for Research in Agricultural Economics." Journal of Farm Economics. (August, 1961), pp. 513-553.

Sosnick, Stephen H. "A Critique of Concepts of Workable Competition," Quarterly Journal of Economics. (August, 1958), pp. 380-423.

APPENDIX TABLE NUMBER 1
COMPUTER PROGRAM ONE

```
   MON$$      JOB  ROSS OLSON      PHASE ONE
   MON$$      COMT 30,15,PAGES,,OLSON AGECON
   MON$$      ASGN MJB,12
   MON$$      ASGN MGO,16
   MON$$      MODE GO,TEST
   MON$$      EXEQ FORTRAN,,,6,,,,OLSON
    DIMENSION X(108,14),NCT(6),SUM(6),SS(6),XNCT(6),YHT(6),SYHT(6),AHT
   1(6),SAHT(6)
 51 FORMAT(5I5)
 52 FORMAT(14F5.0)
 53 FORMAT(1H ,5X,5HID = ,I3)
 54 FORMAT(1H ,13X,1H1,14X,1H2,14X,1H3,14X,1H4,14X,1H5,14X,1H6,15X,4HC
   1OEF)
 55 FORMAT(1H ,1X,3HYHT,4X,6(E12.6,3X),10X,F10.5)
 56 FORMAT(1H ,1X,4HSYHT,3X,6(E12.6,3X))
 57 FORMAT(1H ,1X,3HAHT,4X,6(E12.6,3X))
 58 FORMAT(1H ,1X,4HSAHT,3X,6(E12.6,3X))
 59 FORMAT(6(E10.4),1X,F10.5,2X,1H1,1X,I5)
 60 FORMAT(6(E10.4),13X,1H2,1X,I5)
 61 FORMAT(6(E10.4),13X,1H3,1X,I5)
 62 FORMAT(6(E10.4),13X,1H4,1X,I5)
 63 FORMAT(1H ,1X,3HSUM,4X,6(E12.6,3X))
 64 FORMAT(1H ,1X,4HXNC,3X,6(E12.6,3X))
  1 READ(1,51)ID,NC,N,NSZ,NUPR
    IF(ID.EQ.0)STOP
  2 READ(1,52)((X(I,J),J=1,14),I=1,NC)
    DO 101 K=1,6
    NCT(K)=0
    SUM(K)=0.0
    SS(K)=0.0
101 CONTINUE
    DO 102 I=1,NC
    DO 102 J=1,14
    IF(NUPR.EQ.150)GO TO 201
    IF(X(I,J).EQ.0.0)GO TO 102
    IF(X(I,J).LE.25.0)GO TO 103
    IF(X(I,J).LE.50.0)GO TO 104
    IF(X(I,J).LE.100.0)GO TO 105
    IF(X(I,J).LE.200.0)GO TO 106
    IF(X(I,J).LE.399.0)GO TO 107
```

APPENDIX TABLE NUMBER 1 CONTINUED
COMPUTER PROGRAM ONE

```
      GO TO 108
  201 IF(X(I,J).EQ.0.0)GO TO 102
      IF(X(I,J).LE.25.0)GO TO 103
      IF(X(I,J).LE.50.0)GO TO 104
      IF(X(I,J).LE.75.0)GO TO 105
      IF(X(I,J).LE.149.0)GO TO 106
      IF(X(I,J).LE.300.0)GO TO 107
      GO TO 108
  103 NCT(1)=NCT(1)+1
      SUM(1)=SUM(1)+X(I,J)
      SS(1)=SS(1)+X(I,J)**2
      GO TO 102
  104 NCT(2)=NCT(2)+1
      SUM(2)=SUM(2)+X(I,J)
      SS(2)=SS(2)+X(I,J)**2
      GO TO 102
  105 NCT(3)=NCT(3)+1
      SUM(3)=SUM(3)+X(I,J)
      SS(3)=SS(3)+X(I,J)**2
      GO TO 102
  106 NCT(4)=NCT(4)+1
      SUM(4)=SUM(4)+X(I,J)
      SS(4)=SS(4)+X(I,J)**2
      GO TO 102
  107 NCT(5)=NCT(5)+1
      SUM(5)=SUM(5)+X(I,J)
      SS(5)=SS(5)+X(I,J)**2
      GO TO 102
  108 NCT(6)=NCT(6)+1
      SUM(6)=SUM(6)+X(I,J)
      SS(6)=SS(6)+X(I,J)**2
  102 CONTINUE
      DO 6 I=1,6
      XNCT(I)=NCT(I)
    6 CONTINUE
      NLIT=0
      DO 4 I=1,5
      NLIT=NLIT+NCT(I)
```

APPENDIX TABLE NUMBER 1 CONTINUED
COMPUTER PROGRAM ONE

```
 4 CONTINUE
   XNLIT=NLIT
   NPRM=N-NCT(6)
   XNPRM=NPRM
   IF(NUPR.EQ.150)GO TO 10
   DO 5 I=1,5
   YHT(I)=(XNPRM/XNLIT)*SUM(I)
   SYHT(I)=(XNPRM/SQRT(XNLIT))*SQRT(1.0-(XNLIT/XNPRM))*SQRT((SS(I)-(S
  1UM(I)**2)/XNLIT)/(XNLIT-1.0))
 5 CONTINUE
   YHT(6)=SUM(6)
   SYHT(6)=SQRT((SS(6)-(SUM(6)**2)/XNCT(6))/(XNCT(6)-1.0))
   GO TO 11
10 DO 12 I=1,4
   YHT(I)=(XNPRM/XNLIT)*SUM(I)
   SYHT(I)=(XNPRM/SQRT(XNLIT))*SQRT(1.0-(XNLIT/XNPRM))*SQRT((SS(I)-(S
  1UM(I)**2)/XNLIT)/(XNLIT-1.0))
12 CONTINUE
   YHT(5)=SUM(5)
   YHT(6)=SUM(6)
   SYHT(5)=SQRT((SS(5)-(SUM(5)**2)/XNCT(5))/(XNCT(5)-1.0))
   SYHT(6)=SQRT((SS(6)-(SUM(6)**2)/XNCT(6))/(XNCT(6)-1.0))
11 NDUM=5
   IF(NUPR.EQ.150)NDUM=4
   DO 7 I=1,NDUM
   AHT(I)=XNPRM*XNCT(I)/XNLIT
 7 SAHT(I)=SQRT(XNPRM*(XNPRM-XNLIT)/(XNLIT-1.0))*SQRT(XNCT(I)*(1.0-XN
  1CT(I)/XNLIT)/XNLIT)
   NDUM=NDUM+1
   DO77I=NDUM,6
   AHT(I)=XNCT(I)
77 SAHT(I)=SQRT(XNPRM*(XNPRM-XNLIT)/(XNLIT-1.0))*SQRT(XNCT(I)*(1.0-XN
  1CT(I)/XNLIT)/XNLIT)
   COEF=XNPRM/(XNPRM-XNLIT)
```

COMPUTER PROGRAM ONE

APPENDIX TABLE NUMBER 1 CONTINUED

```
      WRITE(3,53)ID
      WRITE(3,54)
      WRITE(3,55)YHT(1),YHT(2),YHT(3),YHT(4),YHT(5),YHT(6),COEF
      WRITE(3,56)SYHT(1),SYHT(2),SYHT(3),SYHT(4),SYHT(5),SYHT(6)
      WRITE(3,63)(SUM(I),I=1,6)
      WRITE(3,57)AHT(1),AHT(2),AHT(3),AHT(4),AHT(5),AHT(6)
      WRITE(3,58)SAHT(1),SAHT(2),SAHT(3),SAHT(4),SAHT(5),SAHT(6)
      WRITE(3,64)(XNET(I),I=1,6)
      WRITE(2,59)YHT(1),YHT(2),YHT(3),YHT(4),YHT(5),YHT(6),COEF,ID
      WRITE(2,60)SYHT(1),SYHT(2),SYHT(3),SYHT(4),SYHT(5),SYHT(6),ID
      WRITE(2,61)AHT(1),AHT(2),AHT(3),AHT(4),AHT(5),AHT(6),ID
      WRITE(2,62)SAHT(1),SAHT(2),SAHT(3),SAHT(4),SAHT(5),SAHT(6),ID
      GO TO 1
      END
MON$$       EXEQ LINKLOAD
            CALL OLSON
MON$$       EXEQ OLSON,MJR

MON$$       JOB  ACT$$OLSON MCCOY          AGECON     0236S40202
```

APPENDIX TABLE NUMBER 2
COMPUTER PROGRAM TWO

```
MON$$      JOB  ROSS OLSON      PHASE TWO
MON$$      COMT 30,15,PAGES,,OLSON AGECON
MON$$      ASGN MJB,12
MON$$      ASGN MGO,16
MON$$      MODE GO,TEST
MON$$      EXEQ FORTRAN,,,6,,,,OLSON
 DIMENSION A(4,25),ZY(6,6),ZA(6,6)
 51 FORMAT(2I5)
 52 FORMAT(6(E10.4),1X,F10.5)
 53 FORMAT(6(E10.4))
 54 FORMAT(1H ,5X,9HZY MATRIX,5X,I5)
 55 FORMAT(1H ,7X,5HINT 1,14X,5HINT 2,14X,5HINT 3,14X,5HINT 4,14X,5HIN
   1T 5,14X,5HINT 6)
 56 FORMAT(1H ,6(5X,E14.8))
 57 FORMAT(1H ,5X,9HZA MATRIX,5X,I5)
104 READ(1,51)ID,NYRS
    IF(ID.EQ.0)STOP
    DO 2 I=1,NYRS
    READ(1,52)(A(I,J),J=1,7)
    READ(1,53)(A(I,J),J=8,25)
  2 CONTINUE
    IF(NYRS.EQ.3)GO TO 101
    DO 3 I=1,6
    ZY(1,I)=(A(1,I)-A(2,I))/SQRT(A(1,I+7)*A(1,7)+A(2,I+7)*A(2,7))
    ZA(1,I)=(A(1,I+13)-A(2,I+13))/SQRT(A(1,I+19)*A(1,7)+A(2,I+19)*A(2,
   17))
    ZY(2,I)=(A(1,I)-A(3,I))/SQRT(A(1,I+7)*A(1,7)+A(3,I+7)*A(2,7))
    ZA(2,I)=(A(1,I+13)-A(3,I+13))/SQRT(A(1,I+19)*A(1,7)+A(3,I+19)*A(3,
   17))
    ZY(3,I)=(A(1,I)-A(4,I))/SQRT(A(1,I+7)*A(1,7)+A(4,I+7)*A(4,7))
    ZA(3,I)=(A(1,I+13)-A(4,I+13))/SQRT(A(1,I+19)*A(1,7)+A(4,I+19)*A(4,
   17))
    ZY(4,I)=(A(2,I)-A(3,I))/SQRT(A(2,I+7)*A(2,7)+A(3,I+7)*A(3,7))
    ZA(4,I)=(A(2,I+13)-A(3,I+13))/SQRT(A(2,I+19)*A(2,7)+A(3,I+19)*A(3,
   17))
    ZY(5,I)=(A(2,I)-A(4,I))/SQRT(A(2,I+7)*A(2,7)+A(4,I+7)*A(4,7))
    ZA(5,I)=(A(2,I+13)-A(4,I+13))/SQRT(A(2,I+19)*A(2,7)+A(4,I+19)*A(4,
   17))
    ZY(6,I)=(A(3,I)-A(4,I))/SQRT(A(3,I+7)*A(3,7)+A(4,I+7)*A(4,7))
    ZA(6,I)=(A(3,I+13)-A(4,I+13))/SQRT(A(3,I+19)*A(3,7)+A(4,I+19)*A(4,
   17))
```

APPENDIX TABLE NUMBER 2 CONTINUED
COMPUTER PROGRAM TWO

```
  3 CONTINUE
    GO TO 5
101 DO 4 I=1,6
    ZY(1,I)=(A(1,I)-A(2,I))/SQRT(A(1,I+7)*A(1,7)+A(2,I+7)*A(2,7))
    ZA(1,I)=(A(1,I+13)-A(2,I+13))/SQRT(A(1,I+19)*A(1,7)+A(2,I+19)*A(2,
   17))
    ZY(1,I)=(A(1,I)-A(3,I))/SQRT(A(1,I+7)*A(1,7)+A(3,I+7)*A(3,7))
    ZA(1,I)=(A(1,I+13)-A(3,I+13))/SQRT(A(1,I+19)*A(1,7)+A(3,I+19)*A(3,
   17))
    ZY(1,I)=(A(2,I)-A(3,I))/SQRT(A(2,I+7)*A(2,7)+A(3,I+7)*A(3,7))
    ZA(1,I)=(A(2,I+13)-A(3,I+13))/SQRT(A(2,I+19)*A(2,7)+A(3,I+19)*A(3,
   17))
  4 CONTINUE
  5 IF(NYRS.EQ.3)GO TO 102
    WRITE(3,54)ID
    WRITE(3,55)
    WRITE(3,56)((ZY(I,J),J=1,6),I=1,6)
    WRITE(3,57)ID
    WRITE(3,55)
    WRITE(3,56)((ZA(I,J),J=1,6),I=1,6)
    GO TO 103
102 WRITE(3,54)ID
    WRITE(3,55)
    WRITE(3,56)((ZA(I,J),J=1,6),I=1,3)
    WRITE(3,57)ID
    WRITE(3,55)
    WRITE(3,56)((ZA(I,J),J=1,6),I=1,3)
103 GO TO 104
    END
   MON$$      EXEQ LINKLOAD
              CALL OLSON
   MON$$      EXEQ OLSON,MJB
```

APPENDIX TABLE NUMBER 3
COMPUTER PROGRAM THREE

```
  MON$$      JOB  ROSS OLSON     PHASE THREE
  MON$$      COMT 30,15,PAGES,,OLSON AGECON
  MON$$      ASGN MJB,12
  MON$$      ASGN MGO,16
  MON$$      MODE GO,TEST
  MON$$      EXEQ FORTRAN,,,6,,,,OLSON
   DIMENSION A(6),B(6)
51 FORMAT(6(E10.4),13X,I1,1X,I5)
52 FORMAT(1H ,5X,6(F10.4,5X))
53 FORMAT(1H ,5X,13HVARIABLE NO. ,I2,5X,5HID = ,I5)
 3 READ(1,51)A(1),A(2),A(3),A(4),A(5),A(6),NC,ID
   IF(ID.EQ.0)STOP
   SUM=0.0
   DO 1 I=1,6
 1 SUM=SUM+A(I)
   DO 2 I=1,6
 2 B(I)=A(I)/SUM
   WRITE(3,53)NC,ID
   WRITE(3,52)B(1),B(2),B(3),B(4),B(5),B(6)
   GO TO 3
   END
  MON$$      EXEQ LINKLOAD
             CALL OLSON
  MON$$      EXEQ OLSON,MJB
```

Appendix Table Number 4 PERCENT OF GRAINFED CATTLE MARKETED AND PERCENT OF PRODUCING UNITS MARKETING GRAINFED CATTLE BY SIZE CATEGORY, IN DISTRICTS 1 THROUGH 9, 1940, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 1

SIZE CATEGORY	1940 PERCENT CATTLE	1940 PERCENT FARMS	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	77.1	95.2	15.5	56.3	6.8	43.0	3.6	31.6
26 - 50	22.9	4.8	17.6	24.1	9.7	19.5	10.7	29.4
51 - 100	0.0	0.0	13.2	11.3	21.4	21.9	12.6	16.5
101 - 200	0.0	0.0	20.6	6.4	18.6	10.9	16.6	12.1
201 - 399	0.0	0.0	0.0	0.0	7.7	2.4	13.3	6.1
400 - 750	0.0	0.0	13.0	1.3	8.2	1.2	14.5	3.0
751 - 1000	0.0	0.0	0.0	0.0	5.5	0.5	3.0	0.4
1001 - 5000	0.0	0.0	20.1	0.6	22.1	0.6	18.5	0.8
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.1

DISTRICT NUMBER 2

1 - 25	25.5	76.0	30.8	70.8	17.1	52.7	11.9	48.4
26 - 50	27.8	14.3	29.4	19.2	26.0	27.1	18.8	26.3
51 - 100	23.9	6.7	20.7	7.2	26.2	14.2	20.6	14.2
101 - 200	18.5	2.8	12.2	2.3	15.0	4.0	17.5	6.3
201 - 399	0.0	0.0	6.9	0.5	10.3	1.6	19.5	3.9
400 - 750	4.3	0.2	0.0	0.0	3.1	0.3	7.9	0.8
751 - 1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1001 - 5000	0.0	0.0	0.0	0.0	2.3	0.1	3.8	0.1
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table Number 4 continued

PERCENT OF GRAINFED CATTLE MARKETED AND PERCENT OF PRODUCING UNITS MARKETING GRAINFED CATTLE BY SIZE CATEGORY, IN DISTRICTS 1 THROUGH 9, 1940, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 3

SIZE CATEGORY	1940 PERCENT CATTLE	1940 PERCENT FARMS	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	32.5	82.0	26.3	75.0	19.8	64.3	13.1	56.7
26 - 50	18.8	10.0	18.4	14.0	18.4	18.7	14.9	21.9
51 - 100	19.2	5.2	17.5	6.8	20.6	10.8	16.5	11.4
101 - 200	16.6	2.2	16.1	3.0	16.3	4.3	15.8	5.4
201 - 399	4.2	0.3	5.8	0.7	9.8	1.4	17.8	3.5
400 - 750	5.7	0.2	5.7	0.3	4.7	0.3	6.2	0.6
751 - 1000	3.0	0.1	3.3	0.1	3.1	0.1	2.9	0.2
1001 - 5000	0.0	0.0	6.9	0.1	7.3	0.1	7.8	0.2
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.1

DISTRICT NUMBER 4

1 - 25	16.1	76.5	9.4	35.3	2.3	23.3	1.9	25.6
26 - 50	14.8	12.0	26.1	41.1	6.8	23.3	3.9	18.6
51 - 100	8.7	4.3	5.7	5.9	9.8	16.9	8.4	20.3
101 - 200	16.1	4.3	30.2	11.7	28.9	23.2	19.5	20.3
201 - 399	5.7	0.9	28.6	6.0	19.9	8.5	7.5	5.1
400 - 750	10.9	0.8	0.0	0.0	14.8	3.6	21.2	6.4
751 - 1000	27.7	1.2	0.0	0.0	0.0	0.0	6.3	1.3
1001 - 5000	0.0	0.0	0.0	0.0	17.5	1.2	20.0	2.0
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.4

Appendix Table Number 4 continued — PERCENT OF GRAINFED CATTLE MARKETED AND PERCENT OF PRODUCING UNITS MARKETING GRAINFED CATTLE BY SIZE CATEGORY, IN DISTRICTS 1 THROUGH 9, 1940, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 5

SIZE CATEGORY	1940 PERCENT CATTLE	1940 PERCENT FARMS	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	15.1	70.4	25.0	72.1	13.6	52.1	10.8	47.6
26 - 50	16.9	14.4	20.7	16.2	19.7	24.7	15.4	23.2
51 - 100	18.1	8.1	20.2	8.0	21.3	12.6	22.2	16.3
101 - 200	20.0	4.2	13.1	2.6	25.8	8.2	21.0	9.1
201 - 399	20.1	2.3	7.2	0.6	9.1	1.7	11.4	2.2
400 - 750	8.0	0.5	6.1	0.3	6.4	0.5	9.1	1.1
751 - 1000	1.8	0.1	2.2	0.1	1.2	0.1	4.4	0.3
1001 - 5000	0.0	0.0	5.5	0.1	2.9	0.1	5.7	0.2
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DISTRICT NUMBER 6

1 - 25	20.5	79.0	21.1	71.6	13.4	57.9	10.7	61.1
26 - 50	12.2	10.0	15.4	13.5	16.1	22.1	9.2	17.2
51 - 100	15.8	6.2	21.9	9.8	16.4	11.4	14.0	12.8
101 - 200	14.3	2.9	18.1	4.1	15.4	5.6	11.8	5.7
201 - 399	10.0	1.0	3.4	0.4	8.9	1.8	5.6	1.6
400 - 750	8.9	0.5	4.9	0.3	7.9	0.8	7.4	1.0
751 - 1000	6.2	0.2	0.9	0.1	2.2	0.1	2.9	0.2
1001 - 5000	12.1	0.2	2.9	0.1	10.3	0.2	8.3	0.3
more than 5000	0.0	0.0	11.4	0.1	9.4	0.1	30.1	0.1

Appendix Table Number 4 continued

PERCENT OF GRAINFED CATTLE MARKETED AND PERCENT OF PRODUCING UNITS MARKETING GRAINFED CATTLE BY SIZE CATEGORY, IN DISTRICTS 1 THROUGH 9, 1940, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 7

SIZE CATEGORY	1940 PERCENT CATTLE	1940 PERCENT FARMS	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	24.7	83.2	5.0	36.6	1.6	36.7	1.0	30.7
26 - 50	18.6	8.3	19.1	26.1	1.4	7.9	2.5	20.7
51 - 100	21.2	5.2	37.2	26.1	6.5	18.4	3.0	13.8
101 - 200	29.2	3.1	27.1	10.5	16.9	23.6	6.4	15.5
201 - 399	0.0	0.0	0.0	0.0	10.3	7.9	6.0	8.7
400 - 750	6.3	0.2	0.0	0.0	8.4	3.5	12.4	8.1
751 - 1000	0.0	0.0	11.6	0.7	3.9	1.0	1.5	0.5
1001 - 5000	0.0	0.0	0.0	0.0	0.0	0.0	6.1	1.0
more than 5000	0.0	0.0	0.0	0.0	51.0	1.0	61.1	1.0

DISTRICT NUMBER 8

1 - 25	27.6	82.3	26.7	75.5	13.1	56.0	9.4	56.4
26 - 50	12.9	7.8	18.6	13.8	11.8	16.0	9.8	16.4
51 - 100	16.6	5.5	18.1	6.2	24.5	16.4	14.9	13.1
101 - 200	13.3	2.3	18.9	3.2	18.8	7.5	17.3	8.0
201 - 399	17.7	1.6	13.2	1.1	19.4	3.2	17.5	4.2
400 - 750	6.1	0.3	1.7	0.1	6.1	0.6	8.5	1.1
751 - 1000	1.9	0.1	2.8	0.1	1.2	0.1	3.5	0.3
1001 - 5000	3.9	0.1	0.0	0.0	5.1	0.2	8.1	0.4
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.1

Appendix Table Number 4 continued — PERCENT OF GRAINFED CATTLE MARKETED AND PERCENT OF PRODUCING UNITS MARKETING GRAINFED CATTLE BY SIZE CATEGORY, IN DISTRICTS 1 THROUGH 9, 1940, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 9

SIZE CATEGORY	1940 PERCENT CATTLE	1940 PERCENT FARMS	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	21.9	79.6	21.5	75.9	16.7	64.2	16.1	59.8
26 - 50	16.2	10.5	13.5	10.6	14.1	15.7	17.2	21.5
51 - 100	17.4	5.5	19.3	7.7	19.8	11.1	15.9	10.0
101 - 200	16.0	2.6	19.4	3.9	18.3	5.9	15.7	5.3
201 - 399	13.2	1.2	11.8	1.4	15.2	2.4	11.9	2.1
400 - 750	11.0	0.5	6.3	0.4	4.9	0.4	10.6	1.0
751 - 1000	4.3	0.1	0.0	0.0	2.3	0.1	2.5	0.1
1001 - 5000	0.0	0.0	8.2	0.1	8.7	0.2	10.1	0.2
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table Number 5
PERCENT OF GRASSFED CATTLE MARKETED AND PERCENT OF PRODUCING UNITS MARKETING GRASSFED CATTLE BY SIZE CATEGORY IN DISTRICTS 1 THROUGH 9, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 1

Size Category	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	43.8	80.8	27.5	63.9	16.1	52.9
26 - 50	29.5	13.7	30.1	22.6	21.9	25.9
51 - 100	16.9	4.3	24.2	9.9	18.0	11.5
101 - 200	9.3	1.1	17.1	3.5	22.4	6.9
201 - 399	0.0	0.0	0.0	0.0	15.4	2.3
400 - 750	0.5	0.1	1.1	0.1	3.5	0.3
751 - 1000	0.0	0.0	0.0	0.0	0.6	0.1
1001 - 5000	0.0	0.0	0.0	0.0	2.1	0.1
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0

DISTRICT NUMBER 2

Size Category	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	59.4	91.2	39.0	75.8	25.7	64.7
26 - 50	17.9	6.3	29.2	17.3	25.2	21.1
51 - 100	9.3	1.8	17.2	5.4	20.4	9.0
101 - 200	3.3	0.3	7.5	1.1	18.5	4.1
201 - 399	7.8	0.3	1.5	0.1	6.6	0.8
400 - 750	2.3	0.1	1.3	0.1	3.2	0.2
751 - 1000	0.0	0.0	1.1	0.1	0.4	0.1
1001 - 5000	0.0	0.0	3.2	0.1	0.0	0.0
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0

DISTRICT NUMBER 3

Size Category	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	65.5	93.2	44.4	84.4	43.7	79.4
26 - 50	14.2	4.5	23.6	10.7	27.0	14.9
51 - 100	11.2	1.8	14.3	3.3	14.8	4.0
101 - 200	3.1	0.3	9.4	1.0	9.5	1.4
201 - 399	3.2	0.1	5.8	0.4	0.0	0.0
400 - 750	2.8	0.1	1.4	0.1	3.0	0.1
751 - 1000	0.0	0.0	1.1	0.1	0.8	0.1
1001 - 5000	0.0	0.0	0.0	0.0	1.2	0.1
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0

Appendix Table Number 5, continued
PERCENT OF GRASSFED CATTLE MARKETED AND PERCENT OF PRODUCING UNITS MARKETING GRASSFED CATTLE BY SIZE CATEGORY IN DISTRICTS 1 THROUGH 9, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 4

Size Category	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	19.3	67.9	9.6	46.6	6.9	36.3
26 - 50	13.2	13.7	12.8	20.8	11.9	24.5
51 - 100	18.4	10.5	26.8	20.8	16.0	17.8
101 - 200	17.4	5.2	15.4	6.5	28.6	14.8
201 - 399	8.9	1.3	15.4	3.5	14.5	4.2
400 - 750	13.9	1.1	11.1	1.3	11.6	1.7
751 - 1000	2.8	0.1	4.4	0.3	4.9	0.4
1001 - 5000	6.1	0.2	4.5	0.2	5.6	0.3
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0

DISTRICT NUMBER 5

1 - 25	46.7	86.2	37.0	77.6	26.2	66.7
26 - 50	22.5	10.0	21.4	13.5	22.0	18.8
51 - 100	11.6	2.4	23.8	7.3	21.5	9.4
101 - 200	8.8	0.9	8.0	1.2	18.1	4.0
201 - 399	4.8	0.2	1.6	0.2	4.8	0.6
400 - 750	4.1	0.1	3.7	0.2	5.4	0.4
751 - 1000	0.7	0.1	1.2	0.1	0.0	0.0
1001 - 5000	0.8	0.1	3.3	0.1	2.0	0.1
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0

DISTRICT NUMBER 6

1 - 25	39.5	88.3	33.5	80.7	29.6	76.8
26 - 50	16.5	7.2	17.6	11.2	17.5	12.9
51 - 100	13.2	2.9	16.1	5.0	18.0	7.0
101 - 200	6.3	0.6	11.1	1.9	12.9	2.2
201 - 399	11.2	0.6	7.1	0.6	5.1	0.6
400 - 750	4.0	0.1	6.6	0.3	6.4	0.3
751 - 1000	1.2	0.1	1.8	0.1	2.7	0.1
1001 - 5000	4.0	0.1	2.2	0.1	7.8	0.1
more than 5000	4.1	0.1	4.0	0.1	0.0	0.0

Appendix Table Number 5, continued
PERCENT OF GRASSFED CATTLE MARKETED AND PERCENT OF PRODUCING UNITS MARKETING GRASSFED CATTLE BY SIZE CATEGORY IN DISTRICTS 1 THROUGH 9, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 7

Size Category	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	19.5	66.7	7.6	46.1	4.7	34.5
26 - 50	17.2	17.5	9.0	16.2	9.2	22.0
51 - 100	18.8	9.2	19.6	17.6	15.1	18.5
101 - 200	16.3	4.0	28.9	14.2	24.5	14.7
201 - 399	10.2	1.7	17.9	4.1	22.4	7.3
400 - 750	7.9	0.6	10.4	1.4	13.4	2.3
751 - 1000	2.4	0.1	1.4	0.1	3.2	0.3
1001 - 5000	7.7	0.2	5.2	0.3	7.5	0.4
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0

DISTRICT NUMBER 8

Size Category	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	35.8	84.8	22.6	70.6	16.5	61.8
26 - 50	15.6	8.3	16.4	14.4	14.2	17.2
51 - 100	13.5	3.5	18.2	8.3	19.9	11.6
101 - 200	21.6	2.8	19.4	4.6	20.5	6.1
201 - 399	3.3	0.2	12.2	1.5	14.0	2.2
400 - 750	5.3	0.2	6.5	0.4	10.1	0.9
751 - 1000	3.9	0.1	3.3	0.1	1.8	0.1
1001 - 5000	1.0	0.1	1.4	0.1	3.0	0.1
more than 5000	0.0	0.0	0.0	0.0	0.0	0.0

DISTRICT NUMBER 9

Size Category	1950 PERCENT CATTLE	1950 PERCENT FARMS	1960 PERCENT CATTLE	1960 PERCENT FARMS	1963 PERCENT CATTLE	1963 PERCENT FARMS
1 - 25	49.2	90.3	30.1	77.9	27.7	72.9
26 - 50	17.4	6.5	17.1	11.7	21.1	16.3
51 - 100	10.3	1.9	17.6	6.3	17.6	6.8
101 - 200	8.5	0.7	16.5	2.8	12.1	2.3
201 - 399	4.8	0.2	8.6	0.6	11.2	1.2
400 - 750	3.8	0.1	7.5	0.5	5.9	0.3
751 - 1000	0.6	0.1	1.8	0.1	2.0	0.1
1001 - 5000	1.6	0.1	0.8	0.1	2.4	0.1
more than 5000	3.8	0.1	0.0	0.0	0.0	0.0

Appendix Table 6 PERCENT OF HOGS PRODUCED AND PERCENT OF UNITS PRODUCING HOGS BY SIZE CATEGORY, IN DISTRICTS 1 THROUGH 9, 1940, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 1

	1940		1950		1960		1963	
Size Category	PERCENT PIGS	PERCENT FARMS	PERCENT PIGS	PERCENT FARMS	PERCENT PIGS	PERCENT FARMS	PERCENT PIGS	PERCENT FARMS
1 - 25	45.8	78.3	23.3	57.8	4.5	26.4	2.7	23.8
26 - 50	27.8	16.1	28.9	26.2	9.9	23.3	5.4	17.3
51 - 75	8.2	2.8	15.8	8.2	11.4	15.2	4.9	9.7
76 - 149	8.0	1.8	18.8	6.0	22.3	17.3	12.6	15.1
150 - 299	8.1	0.9	9.3	1.5	35.7	15.2	42.2	26.4
300 or more	2.1	0.1	3.9	0.3	16.2	2.6	32.2	7.7

DISTRICT NUMBER 2

1 - 25	35.4	69.2	18.0	49.1	3.7	22.7	1.7	14.7
26 - 50	29.5	20.6	28.5	29.6	11.3	24.0	4.2	15.5
51 - 75	12.4	4.9	16.4	9.9	12.0	16.3	6.1	13.8
76 - 149	17.5	4.6	23.8	9.0	22.1	18.9	11.9	16.4
150 - 299	4.8	0.6	10.5	2.1	35.9	15.8	44.2	31.3
300 or more	0.4	0.1	2.8	0.3	15.0	2.3	31.9	8.3

DISTRICT NUMBER 3

1 - 25	25.0	57.5	11.7	39.0	3.1	18.4	1.5	12.6
26 - 50	31.9	28.0	24.1	30.5	9.7	23.0	4.6	15.7
51 - 75	15.7	8.1	18.0	13.4	10.8	15.7	6.4	13.5
76 - 149	15.9	5.0	26.0	12.6	21.9	20.6	15.0	19.0
150 - 299	7.1	1.2	17.0	4.2	41.3	19.6	47.4	32.0
300 or more	4.4	0.2	3.2	0.3	13.2	2.7	25.1	7.2

Appendix Table 6 continued — PERCENT OF HOGS PRODUCED AND PERCENT OF UNITS PRODUCING HOGS BY SIZE CATEGORY, IN DISTRICTS 1 THROUGH 9, 1940, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 4

Size Category	1940 PERCENT PIGS	1940 PERCENT FARMS	1950 PERCENT PIGS	1950 PERCENT FARMS	1960 PERCENT PIGS	1960 PERCENT FARMS	1963 PERCENT PIGS	1963 PERCENT FARMS
1 - 25	53.0	84.4	29.9	68.8	16.2	58.1	2.3	15.2
26 - 50	17.7	9.0	21.0	15.9	16.1	15.8	13.7	33.5
51 - 75	13.6	3.8	19.2	7.9	16.2	10.6	7.9	12.2
76 - 149	11.1	2.3	24.1	6.6	25.8	10.6	21.1	21.3
150 - 299	4.6	0.5	4.7	0.7	22.0	4.6	27.2	13.1
300 or more	0.0	0.0	1.1	0.1	3.7	0.3	27.8	4.7

DISTRICT NUMBER 5

1 - 25	47.3	78.6	30.6	63.9	7.7	33.2	3.6	25.1
26 - 50	28.7	15.5	33.2	24.9	23.5	34.9	6.3	17.7
51 - 75	13.6	4.1	15.4	6.6	9.2	8.7	8.0	13.2
76 - 149	7.7	1.5	14.4	3.7	25.7	14.6	16.5	16.6
150 - 299	1.8	0.2	5.7	0.8	26.3	7.5	41.8	22.1
300 or more	0.9	0.1	0.7	0.1	7.6	1.1	23.8	5.3

DISTRICT NUMBER 6

1 - 25	34.4	67.8	18.3	49.0	5.5	28.1	1.6	16.2
26 - 50	33.7	23.1	30.2	29.6	12.6	27.5	6.2	20.7
51 - 75	12.3	4.9	21.4	12.4	10.8	13.3	5.6	10.8
76 - 149	13.9	3.5	18.7	6.9	21.5	15.8	15.6	18.3
150 - 299	4.4	0.6	9.6	1.9	32.3	12.8	44.9	27.4
300 or more	1.3	0.1	1.8	0.2	17.3	2.5	26.1	6.6

Appendix Table 6 continued — PERCENT OF HOGS PRODUCED AND PERCENT OF UNITS PRODUCING HOGS BY SIZE CATEGORY, IN DISTRICTS 1 THROUGH 9, 1940, 1950, 1960, 1963, KANSAS

DISTRICT NUMBER 7

Size Category	1940 PERCENT PIGS	1940 PERCENT FARMS	1950 PERCENT PIGS	1950 PERCENT FARMS	1960 PERCENT PIGS	1960 PERCENT FARMS	1963 PERCENT PIGS	1963 PERCENT FARMS
1 - 25	48.4	80.8	36.0	76.6	6.5	49.0	2.7	25.1
26 - 50	29.1	14.5	25.0	14.8	4.7	9.8	7.7	25.1
51 - 75	6.7	2.1	10.1	3.7	10.1	13.1	3.1	5.6
76 - 149	9.8	2.1	17.4	3.7	25.2	16.4	10.4	11.2
150 - 299	4.6	0.4	9.6	1.1	25.3	9.0	43.8	24.9
300 or more	1.4	0.1	1.9	0.1	28.2	2.7	32.3	8.1

DISTRICT NUMBER 8

Size Category	1940 PERCENT PIGS	1940 PERCENT FARMS	1950 PERCENT PIGS	1950 PERCENT FARMS	1960 PERCENT PIGS	1960 PERCENT FARMS	1963 PERCENT PIGS	1963 PERCENT FARMS
1 - 25	36.3	71.0	24.5	60.7	7.1	33.6	2.8	20.9
26 - 50	31.0	20.5	30.7	25.6	11.1	21.5	7.9	24.5
51 - 75	11.7	4.3	11.8	5.8	14.0	16.6	6.1	11.7
76 - 149	10.8	3.0	17.7	5.5	24.4	16.0	10.8	12.9
150 - 299	8.4	1.1	13.8	2.3	26.8	10.1	34.4	21.9
300 or more	1.8	0.1	1.5	0.1	16.6	2.2	38.0	8.1

DISTRICT NUMBER 9

Size Category	1940 PERCENT PIGS	1940 PERCENT FARMS	1950 PERCENT PIGS	1950 PERCENT FARMS	1960 PERCENT PIGS	1960 PERCENT FARMS	1963 PERCENT PIGS	1963 PERCENT FARMS
1 - 25	44.4	74.6	25.5	58.8	6.4	29.9	3.8	27.0
26 - 50	32.8	19.7	31.4	26.4	15.2	28.1	7.3	21.4
51 - 75	10.1	3.4	16.9	8.5	12.7	14.6	8.1	13.1
76 - 149	8.0	1.8	15.9	4.8	22.7	16.0	12.5	12.8
150 - 299	3.1	0.4	7.8	1.3	25.1	9.2	37.3	20.1
300 or more	1.6	0.1	2.5	0.2	17.9	2.2	31.0	5.6

A STUDY OF STRUCTURAL CHANGES IN THE LIVESTOCK ECONOMY OF KANSAS

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B.S., Kansas State University, 1965

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Economics

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1967

The objective of this study was to identify the pattern of change in the structure of livestock production in Kansas. Thus, concerned with measuring changes that have occurred in the degree of concentration, this study was designed to identify the pattern of change in size, number, and location of livestock producing units in Kansas for three various types of livestock, since 1940: grainfed cattle, grassfed cattle, and hogs.

The state was divided into nine subareas, corresponding to the Statistical Reporting Services's crop reporting districts. Data was collected by randomly sampling each county and summarizing the information into district totals. County assessor's records were used as the source of data. After observing the various livestock cycles and considering the questions asked by the county assessors, the years 1940, 1950, 1960, and 1963 were chosen as those from which data would be obtained.

Meaningful size categories of livestock producing units were established. Utilizing the facilities of the 1410 IBM computer on the Kansas State University campus, the sample number of producing units in each size category, and the sample number of livestock produced by these units, according to districts and years, were determined. This information was also computed in terms of percentages. Further, these numbers were enlarged to approximate the actual numbers in the state, and their standard errors of estimates were derived to indicate the achieved 90 percent confidence interval. T-tests were computed, on all comparisons of years over each district for each size category, to

determine significant changes in the number of producing units and in the number of livestock produced. Due to the large changes in numbers over the ten year intervals studied, practically all t-tests denoted significant changes.

Analysis of the data indicated that the large scale producer is accounting for increasingly larger portions of the livestock produced. The small scale producers are decreasing in importance both in terms of the percent of producers and in the percent of livestock produced.

The growth in percent of grassfed cattle marketed by large scale producers, has occurred to the greatest extent in the southwestern area of the state, reflecting a change in concentration from the eastern to the southwestern area. The most pronounced reduction in grainfed cattle production occurred in southeastern Kansas. The northern one-third of the state exhibited increased concentration in the smaller size categories.

Grassfed cattle production data indicated that the major portion of the small producers were located in the northern and eastern regions, whereas the large scale producers were concentrated in the southern and western regions of the state. The percentages of grassfed cattle marketed by small scale producing units has decreased since 1940, while the large scale producing units were of increased importance.

No definite changes in the concentration of hog production within size categories were observed. However, definite patterns were set as to the importance of areas of the state as related

to concentration of producers in the different size categories. The change in concentration of the producing units shifted from southeast to north and north central Kansas as larger size categories of producing units were considered, with the western one-third of the state exhibiting the area of least concentration in all size categories.