



The organization and structure of  
by B Beattie

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of  
MASTER OF SCIENCE in Agricultural Economics  
Montana State University  
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**Abstract:**

The purpose of this research study was to describe as completely as possible the organization and structure of the beef cattle industry in 18 counties of southeastern Montana. The description was accomplished by cross-classifying individual ranch data concerning nonbeef livestock enterprises, crop enterprises, the hay base, the pasture base, ranch size, and land tenure. Data concerning each of these items were stratified and then cross-classified with seven cow-herd-size-categories within each of four study areas. The number of observations, the mean, and the percentage distribution for each stratification were calculated and compared in order to identify unique populations of beef ranches within each area, cow-herd-size-group, and the beef industry of the entire study area.

The results of the study revealed that several unique populations of beef ranches exist within each of the study areas and that different output and input combinations are evident in different areas.

THE ORGANIZATION AND STRUCTURE  
OF THE BEEF CATTLE INDUSTRY  
IN SOUTHEASTERN MONTANA

by

Bruce R. Beattie

A thesis submitted to the Graduate Faculty in partial  
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of

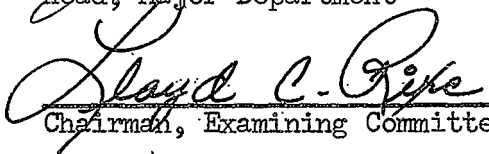
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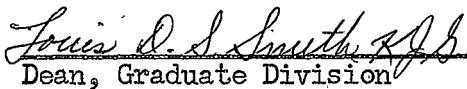
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Any errors or omissions in this study are the responsibility of the author.

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## ABSTRACT

The purpose of this research study was to describe as completely as possible the organization and structure of the beef cattle industry in 18 counties of southeastern Montana.

The description was accomplished by cross-classifying individual ranch data concerning nonbeef livestock enterprises, crop enterprises, the hay base, the pasture base, ranch size, and land tenure. Data concerning each of these items were stratified and then cross-classified with seven cow-herd-size-categories within each of four study areas. The number of observations, the mean, and the percentage distribution for each stratification were calculated and compared in order to identify unique populations of beef ranches within each area, cow-herd-size-group, and the beef industry of the entire study area.

The results of the study revealed that several unique populations of beef ranches exist within each of the study areas and that different output and input combinations are evident in different areas.

## CHAPTER I

### INTRODUCTION

#### Problem Situation

The farming and ranching industry in Montana plays an important role in the income of the state. The beef industry as a particular segment of agriculture has been a very important economic force in the Montana economy since its early beginning. It was the first principle agricultural industry in the state and still remains an important industry to the Montana economy. This is largely due to the fact that the range forage resource, which is so abundant in Montana, is marketed principally through the beef cattle industry.

Agriculture as an industry contributes a greater proportion to the income of the state of Montana than does agriculture to the income of the nation as a whole. Montana derives 17.1 percent of its personal income directly from farming and ranching. Montana ranks fourth highest in the nation as far as percent of personal income derived from farming is concerned. North Dakota, South Dakota, and Iowa are the only states that derive a greater portion of their personal income directly from farming. Farming and ranching contributes only 4.3 percent to the personal income of the United States.<sup>1</sup>

In the state of Montana the livestock industry contributes just about one half of the cash receipts of all farm products marketed. The 1962

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<sup>1</sup>Committee for Economic Development, An Adaptive Program for Agriculture, July, 1962, p. 66.

issue of Montana Agriculture Basic Facts states:

The value of livestock and livestock products marketed rose above the crop value in 1958 and 1959 but were below for the previous six years. Over the period from 1944 to 1959, livestock and livestock products brought in 5 percent less cash receipts than crops marketed.<sup>2</sup>

Table I shows the cash receipts from marketing livestock and livestock products as it is related to total receipts.

TABLE I. CASH RECEIPTS FROM MARKETINGS, LIVESTOCK AND LIVESTOCK PRODUCTS (MONTANA).\*

	1955-1959 Averages				
	All Cash Sales	Average Value	Livestock and Products	1951-1955 Average Value	1955-59 as % of 1951-55
	%	\$	%	\$	%
Livestock & products	49.1	200,046	100.0	180,277	110.9
Cattle & calves	36.4	149,191	74.6	119,719	124.6
Dairy products	3.8	15,550	7.8	15,710	99.0
Sheep & lambs	3.3	13,477	6.7	15,690	85.9
Wool	1.6	6,357	3.2	10,762	59.1
Hogs	1.6	6,390	3.2	8,418	75.9
Eggs	1.4	5,786	2.9	9,108	77.1
Chickens		1,235	0.6		
Other	0.9	2,060	1.0	869	237.0

\*Source: Cooperative Extension Service and Ag. Experiment Station, Montana Agriculture Basic Facts, #293, June, 1962, p. 19.

<sup>2</sup>Cooperative Extension Service and Ag. Experiment Station, Montana Agriculture Basic Facts, #293, June, 1962, p. 19.

During the period from 1955 to 1959, 49.1 percent or nearly one half of all cash sales were attributable to livestock and livestock products in Montana.

One would certainly not expect livestock to decline in importance relative to crops in Montana. Some important changes have taken place in the demand for farm products. As an economy experiences growth and becomes more affluent, the demand for meat and livestock products increases relative to cereal grains. If we assume that as an economy becomes more affluent, it shifts its consumption in the direction of goods with a higher income elasticity of demand, then we could safely say that the demand for meat and livestock products is going to increase relative to the demand for crops (thinking in terms of crops used primarily for human consumption). Therefore, one would not expect resources devoted to livestock production in Montana to be transferred to the production of food grains.

If we focus our attention once again on the data shown in Table I, we see that a significant portion of the cash receipts from Montana's livestock industry comes from cattle and calves. There is reason to believe that the percentage of all livestock receipts resulting from the sale of cattle and calves (beef industry) is likely to increase. In past years cattle numbers and sheep numbers in Montana have tended to follow different trends. Sheep numbered over 5 million head in the first decade of the 1900's, but there were only 1.75 million head on January 1, 1961.<sup>3</sup> This reduction of sheep numbers by 65 percent was accompanied by approxi-

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<sup>3</sup>Ibid., p. 19.

mately a 40 percent increase in cattle numbers over the same period. In the future, cattle numbers are likely to continue to increase and sheep and lambs to decrease. The relationship between beef cattle and sheep numbers over the period from 1925 to 1960 is shown in the following graph (Figure 1). Sheep have decreased almost steadily since 1942.

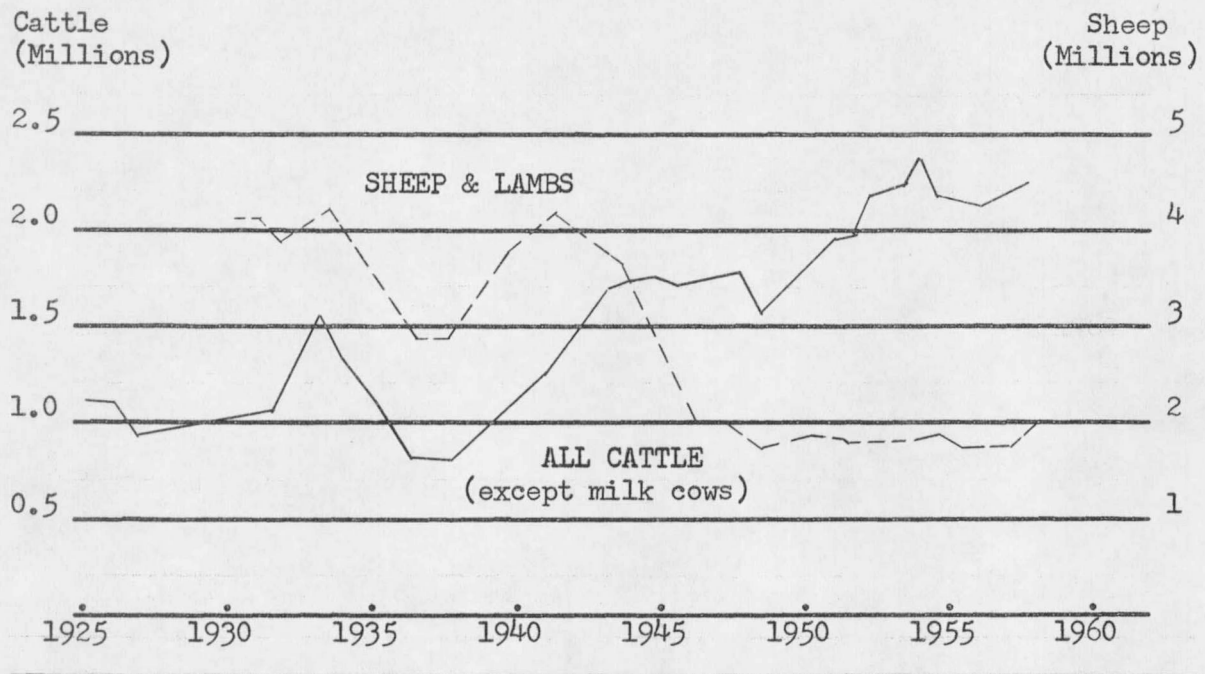


Figure 1. Cattle (except milk cows) and sheep on farms, Montana, 1925-60.\*

\*Source: Cooperative Extension Service and Ag. Experiment Station, Montana Agriculture Basic Facts, #293, June, 1962, p. 19.

Cattle and sheep ranching in Montana is still predominantly a range operation. Therefore, it is natural that as sheep numbers decrease, cattle numbers will increase. In 1950 two-thirds of Montana's land area was in pasture and range, or 63 million acres out of the total of 93.6

million acres.<sup>4</sup> Sheep production has also been shifting from range to farm flocks and from the western states to the east.<sup>5</sup> Land use in Montana is shown in Table II.

TABLE II. MAJOR USES OF LAND IN MONTANA, 1950.\*

	Acres (million)	Percent
Irrigated cropland	2.0	2.1
Non-irrigated cropland	11.5	12.3
Non-forested pasture and range	53.0	56.7
Woodland and forest grazed	10.0	10.7
Woodland and forest not grazed	10.1	10.8
All other land	7.0	7.4
Totals	93.6	100.0

\*Source: Cooperative Extension Service and Ag. Experiment Station, Montana Agriculture Basic Facts, #293, Oct., 1956, p. 34.

Because the beef cattle industry plays an important role as an income source in Montana, we find considerable research effort, concerning the efficiency of resource combination, being directed toward the industry. Economists are interested in a maximum social product. It is recognized that the allocation of scarce resources within and among industries is an important factor in the maximizing process of firms, of industries, and of a total economy. By carefully analyzing the existing resource combination, researchers may discover that a reorganization of resources within firms,

<sup>4</sup>Cooperative Extension Service and Ag. Experiment Station, Montana Agriculture Basic Facts, #293, Oct., 1956, p. 13.

<sup>5</sup>Ibid., p. 13.

industries, or between firms and industries could bring about greater efficiency and hence, greater social product. Consequently, we find many research projects devoted to examining existing resource combinations in the beef cattle industry.

It is essential for us to understand and know as much as possible about the structure of the beef industry and its component individual ranch units before we can draw meaningful conclusions and inferences for the industry. There is a pressing need for us to know if, where, and how many of a well defined homogeneous group of ranches exist if we want to measure the impact of findings in this study and in others for the state or the industry.

Most sources of data available to the researcher and policy-maker are aggregated in such a manner that the identification of particular populations within the agricultural industry is next to impossible. Many sources of data provide statistics concerning the number of beef cows and the number of ranches involved, the number of acres of winter wheat and the number of farms involved, the average number of acres of pasture per ranch, etc., for a particular area. Such data may not be the type of information that the researcher or policy-maker needs.

For instance, the researcher seeking to discover the economic importance of sheep enterprises in combination with beef ranches needs to know not the average number of sheep in Gallatin County, but he needs to know if, and in what numbers, combination beef and sheep ranches exist and where they exist, so that he might study them.

Suppose that a readjustment of the tax rates applied to various qualities of rangeland is proposed. The policymaker needs to know the number of ranches that might have increased income due to that tax change. In order for him to be correct in his judgment, he needs to know not the average carrying capacity of Montana rangeland, but he needs to know the number of ranches that have pasture of certain quality and capacity, and the percentage of the total ranches this comprises in each particular part of the state that might be affected.

It is important for a researcher to have considerable homogeneity in a group of firms studied if he expects his results or conclusions to be sound. The researcher must attempt to keep the variances of the statistical parameters small enough so that the parameters derived and the conclusions made are meaningful. It, therefore, becomes essential that we know how many firms of this homogeneous group exist and where they are located.

#### Research Problem

This research problem is concerned primarily with the structure and organization of the beef cattle industry in the plains area of southeastern Montana. This study is to be the first phase of a study to collect information and estimates relating differences or similarities in Montana range beef ranches regarding: (1) their organization and operation; (2) their costs and returns, their rates of earnings on investment, labor, and management; and (3) the value of the grazing resource of these firms.

In this study we are concerned with phase one, the organization and operation of the ranching industry in southeastern Montana. An attempt will be made to obtain a clear and accurate description of what is in the ranching industry in southeastern Montana and how and where the ranching industry is distributed within the area.

There is a need to designate the ranch structure as it exists in the state of Montana. The ranching industry in Montana is very heterogenous. In Montana we find a diverse combination of natural operating factors. These factors--topography, elevation, soils, range plants, temperature, moisture, winds, etc.--we find in endless combination and great variety.<sup>6</sup> Montana's ranching industry is spread over moist mountain valleys, rough river break lands, dry plains, forest lands, and even fertile cropland areas. Due to Montana's wide range of natural features, we would expect that the size, organization, and output combinations of Montana's ranches would likewise be quite diverse. Accordingly the problem of the researcher in analyzing Montana's beef industry is a complex one.

If, as in later phases of this study, a researcher is interested in studying Montana's beef industry for purposes of analyzing the efficiency of resource allocation, he is confronted by a multitude of different sizes, organizations, input combinations, and output combinations of farms and ranches comprising the total beef industry in the state. It is hoped that this phase of the project will shed considerable light on the what is

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<sup>6</sup>Mont H. Saunderson, Montana Stock Ranches and Ranching Opportunities, 1950, p. 1.

and the location of the beef cattle industry for use in later phases of the study, and for use in other studies. If suggestions and conclusions for improving resource allocation within the industry are to be made, then a complete understanding of the existing structure is necessary.

### Objectives

There is one basic major objective of this study. That is to describe the economic structure and composition of the beef ranching industry in southeastern Montana.

Some secondary objectives that would be accomplished by such a description are:

1. To provide data in such a form that will benefit researchers in setting up study areas and in sampling various populations.
2. To identify and describe some existing populations within the beef industry in the study area.
3. To provide data that will allow researchers to estimate accurately the impact of conclusions drawn in this study and others on the beef industry and the state.

### Limitations

It is necessary that the limitations to this study be pointed out:

1. The ranches to be observed have been limited to those with at least 20 and not more than 500 beef cows. Therefore, any ranches having less than 20 or more than 500 beef cows will not be included.
2. Because the initial sort is to be made on beef cows (including heifers that have calved), any ranch whose entire operation is one of purchasing feeder cattle and fattening them will be excluded.

## CHAPTER II

### PROCEDURE

In any descriptive study of this nature one must choose an approach and method of presentation that is as logical, straight forward, and consistent as possible in order to accomplish the job and leave the reader with a clear and untangled notion about the nature and structure of the subject being described. In this case the decision was made to describe on the basis of area and cow-herd-size. It is hoped that this will result in a clear picture of where ranches with particular characteristics are located, and how they are related to the size of the cow herd.

The general procedure for this problem will be to describe by means of cross-classifying individual ranch data. Data have been collected on one-half of the ranches that have from 20 to 49 (inclusive) beef cows and on all ranches that have from 50 to 500 (inclusive) beef cows in the study area in southeastern Montana. The data for this study, obtained through the cooperation of the Bureau of Land Management and the Bureau of the Census, were collected in 1959.

The description is stratified according to geographic study area and beef-cow-number-grouping. There are four areas and seven beef cow classifications. Each individual ranch observation within each area was sorted into a specific cow-number-category. The description, therefore, entails 28 separate and distinct groups of ranches (7 cow number stratifications and 4 geographic stratifications). The analysis and stratification of land use data and nonbeef livestock data is the same for each area and

cow-number-group. The same basic method of analysis and presentation was used throughout the entire study.

Each chapter, which represents a specific phase of the description, contains appendix tables showing the data distribution by study area and graphs showing the percentage distribution of the various land use and nonbeef livestock stratifications by study area and cow-number-group. Each table contains information relative to the number of observations, the mean, and the percent of total observations for the area.

All stratifications are on a purely physical basis, i.e., acres, cow numbers, animal units, etc. No attempt has been made to convert any data to monetary terms.

#### The Study Area

Each ranch as mentioned earlier was segregated into one of four geographic subareas within the study area. These regions were selected according to two criteria. The counties were grouped as much as possible by (1) geographic, topographic, and climatic similarities; and (2) by type of farming similarities. The total study area and component individual areas are shown in Figure 2. Figure 3 shows the types of farming found throughout the study area.

The total area, which includes 18 counties in southeastern Montana, is bounded on the north by the Missouri River, on the west by mountains and foothills, on the south by Wyoming, and on the east by North and South Dakota. This area, comprising a little less than 1/3 of Montana's land

surface, is characterized by a semiarid climate which is typical of the Great Plains.

Area 1 includes Wheatland, Golden Valley, and Musselshell counties. This group of counties is bounded on the north by the Big Snowy and the Little Belt mountains. Along the western boundary are the Castle and the Crazy mountains. The dominant type of farming found in this group is livestock ranching. A small amount of cash grain farming can be found along the southern edge of Golden Valley County, and some mixed livestock ranching and cash grain farming is located along the northern edge of Musselshell County.

Area 2, which includes the counties of Yellowstone, Treasure, and Big Horn, is a very diversified area. The two major influences in this area are the irrigated Yellowstone Valley and the irrigated valleys along the Big Horn and Little Big Horn rivers. However, most of the agricultural activity of this area outside of the irrigated valleys is classified as livestock ranching.

Area 3 includes Petroleum, Garfield, Prairie, Rosebud, Custer, Powder River, and Carter counties. The dominant type of farming found in this area is livestock ranching. The only major discrepancies are found along the Yellowstone River and in Petroleum and Prairie counties where some cash grain and mixed cash grain and livestock ranching is found. Area 3 represents the semi-arid plains; the average annual rainfall for the seven county area is 12.32 inches.<sup>7</sup>

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<sup>7</sup>USDA Statistical Reporting Service, Montana Agriculture Statistics, VIX, December, 1962, p. 16.

MONTANA

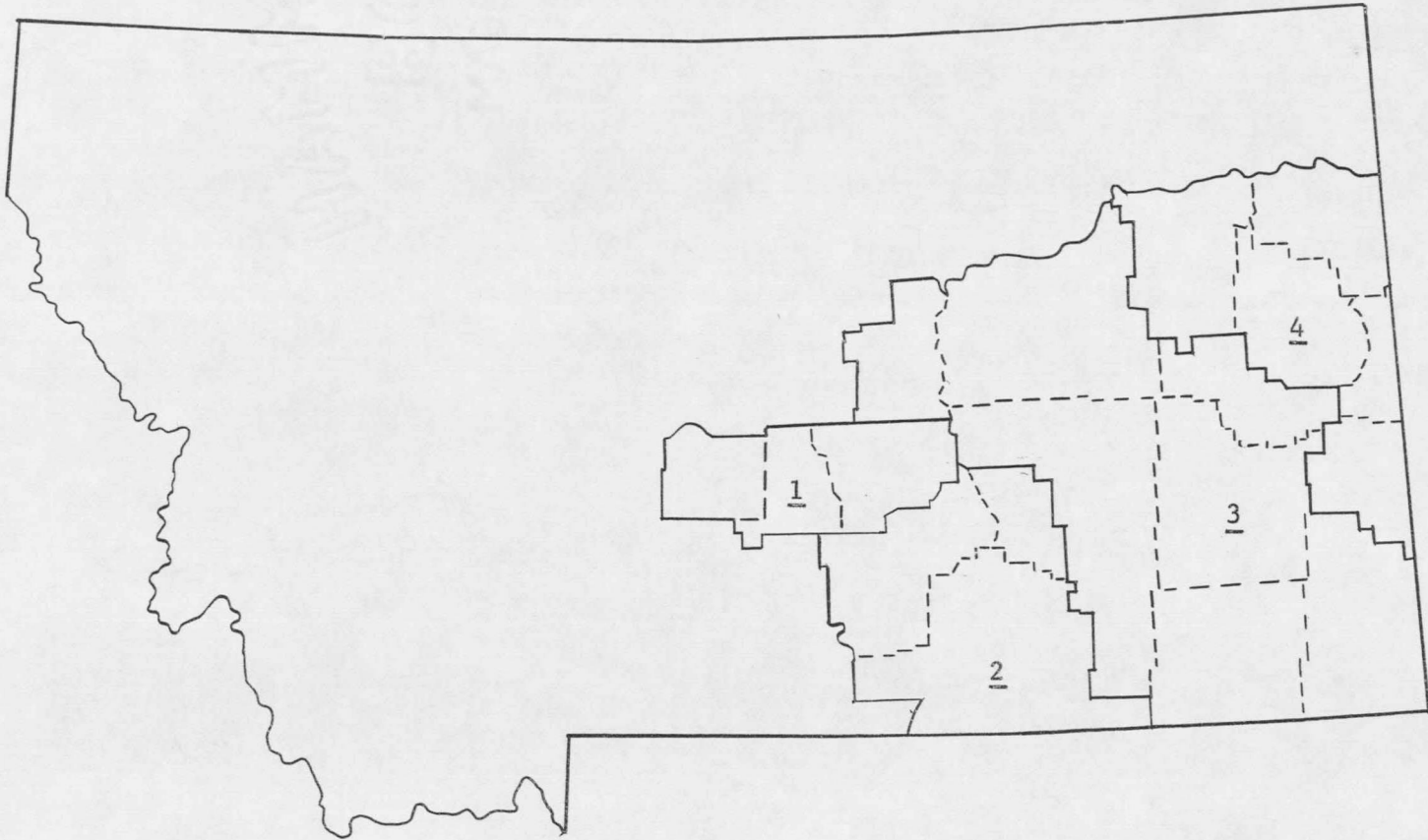
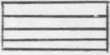
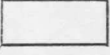


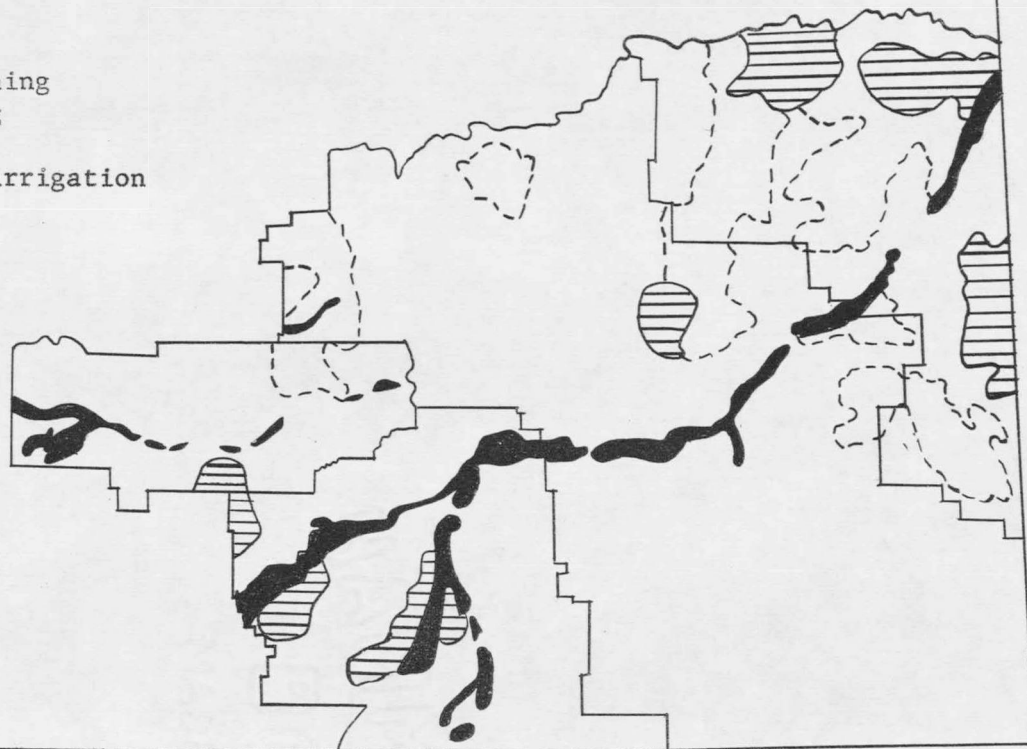


Figure 2. Graphic distribution of study areas.

-  Cash crop farming: Grain
-  Livestock ranching
-  Mixed livestock ranching and cash crop farming
-  General farming and irrigation



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Figure 3. Types of farming.\*

\*Source: Nicholas Helburn, M. J. Edie, and Gordon Lightfoot, Montana in Maps, p. 27.

The fourth area, which includes McCone, Richland, Dawson, Wibaux, and Fallon counties, is similar to Area 2 in that it is quite diversified. However, in Area 4 there is less agriculture that is classified as the livestock ranching type and as general and irrigated farming than in Area 2. In Area 4 we find considerable cash grain farming and mixed cash grain farming and livestock ranching. In the northern part of this area we begin to get into that section of the state which is devoted largely to the production of spring wheat.

As stated previously, the second major sort on the individual ranch observations was by beef cow numbers. The beef-cow-groupings used are as follows:

- Group 1: those ranches with 20 to 49 beef cows;
- Group 2: those ranches with 50 to 74 beef cows;
- Group 3: those ranches with 75 to 99 beef cows;
- Group 4: those ranches with 100 to 149 beef cows;
- Group 5: those ranches with 150 to 199 beef cows;
- Group 6: those ranches with 200 to 299 beef cows;
- Group 7: those ranches with 300 to 500 beef cows.

The observed data is presented in Table III, which includes information of the number of observations found in each cow group, the mean for each group, and the percentage that each group comprises of the total observed ranches of the particular areas. Figure 4 is a pictorial presentation showing, by study area, the percentage of the ranches in each area falling into the various cow groups or stratifications.

TABLE III. BEEF COW NUMBER DISTRIBUTION BY STUDY AREA. <sup>a/</sup>

Cow Strata	Area 1			Area 2			Area 3			Area 4		
	Obs.	Percent		Obs.	Percent		Obs.	Percent		Obs.	Percent	
		Mean	of Area		Mean	of Area		Mean	of Area		Mean	of Area
#	#	%	#	#	%	#	#	%	#	#	%	
20-49	84	35.7	27.7	190	35.9	37.4	308	35.0	25.6	304	35.1	38.5
50-74	73	60.2	24.1	92	60.4	18.1	248	61.7	20.7	198	60.3	25.1
75-99	34	87.0	11.2	72	86.8	14.2	199	87.1	16.6	108	86.1	13.7
100-149	58	119.9	19.1	61	124.1	12.0	191	122.0	15.9	110	119.3	13.9
150-199	25	177.3	8.3	32	170.7	6.3	121	171.3	10.1	29	173.2	3.7
200-299	23	228.3	7.6	38	233.8	7.5	87	236.1	7.2	30	246.5	3.8
300-500	6	421.3	2.0	23	365.4	4.5	47	366.0	3.9	10	406.2	1.3
TOTALS	303 <sup>b/</sup>		100.0	508 <sup>b/</sup>		100.0	1201 <sup>b/</sup>		100.0	789 <sup>b/</sup>		100.0

<sup>a/</sup> The figure for number of observations in cow category 20-49 has been doubled. Data were collected from only 1/2 of the ranches in this cow category. Throughout the remainder of the study the number of observations have not been adjusted for the first cow category.

<sup>b/</sup> These are corrected totals. To get the number of ranches actually observed subtract 1/2 of the first entry from each total.

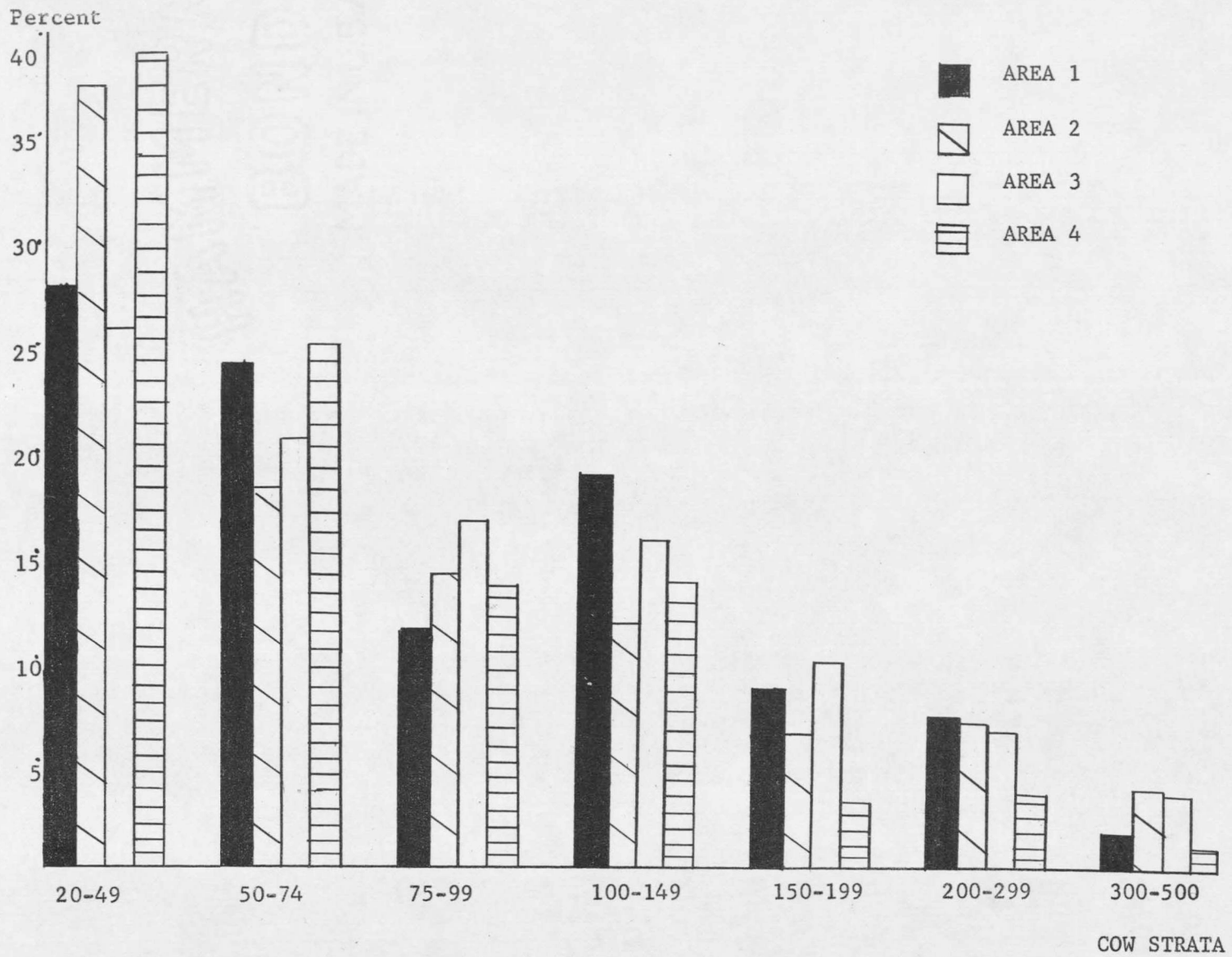


Figure 4. Percentage Distribution of Cow Number Strata By Area.

As one would expect, most of the observations fall into the smaller cow categories. In Areas 1 and 3 considerably fewer observations were found in the 20 to 49 cow strata than in Areas 2 and 4. Area 4 ranks first among the four areas in the first two cow stratifications and last in the last three cow stratifications.

In order for one to evaluate and interpret the tables and graphs in the remainder of this study, it is well to bear in mind the relative number of ranch observations in the various cow categories. In the larger cow categories only a few observations were found; therefore, some distortion in the means of other items stratified (cross-classified) within each individual cow category may occur.

As stated previously, the description of the beef industry in southeastern Montana was accomplished by cross-classifying the individual ranch data of 28 study groups with other livestock data, crop enterprise data, hay data, pasture data, and some general data on land tenure and use.

The description is handled in two major but separate parts. Chapter III deals with the analysis of all the various output or product combinations found on beef ranches in the study area. Chapter III and its associated appendices are further broken into two sections--the first section is an analysis of other livestock enterprises in combination with beef enterprises, namely sheep, swine, and dairy; the second section contains information relative to crop enterprises found in combination with beef enterprises, namely wheat, barley, oats, corn, other crops, and sugar beets.

The second major part of the description, Chapter IV, contains a discussion and analysis of the hay, pasture, and general land inputs found on beef ranches in the study area. There are three appendices for Chapter IV--the first contains tables concerning hay acres, the second contains tables concerning pasture analysis, and the third contains tables on general land use and tenure.

Chapter V is a brief summary of the conclusions made and major trends that were found by the analysis.

## CHAPTER III

### OTHER ENTERPRISES FOUND IN COMBINATION WITH BEEF CATTLE RANCHES

The first phase of the description entails a cross-classification of other ranch output data with the established beef-cow-stratifications. Data concerning other livestock and crop enterprises were stratified within each of the cow and study area stratifications. The stratifications on all of the output data are the same for each beef-cow-herd-size-group or stratification.

The data are presented in graphic form throughout the text, showing the percentage distribution of ranch observations having a particular output stratification in each cow-number-group and study area. The data from which the graphs were constructed are presented in tables in the appendix. The tables contain information on the mean and the number of observations found in each output strata in addition to the percentage distribution.

The reader should recognize that, in some areas, distortions or exaggerations of the percentage distributions do occur because there are only a few observations in some of the larger size categories.

#### Livestock Enterprises

Sheep.---In order to get some picture of the importance of sheep enterprises in conjunction with various sized cattle ranches, the comparison was made on a breeding animal unit basis. All ranches in each cow category were stratified as to whether they had no ewes or between zero and one-half as many animal units of ewes as beef cows, or more than one-half as many animal units of ewes as beef cows. Ranches were sorted into one of the

three categories by taking one-fifth of the ewes and dividing by the number of beef cows. The percentage distributions shown in Figures 5, 6, and 7 are, therefore, distributions of animal unit equivalents of breeding sheep by beef cow strata.

A comparison of beef cattle and sheep on an animal unit basis works well, in that cattle and sheep ranching in southeastern Montana is primarily a range proposition. In many instances the cattle and sheep enterprises must compete for the same land resource. In such instances additional cattle or additional sheep can be added to a given ranch only at the sacrifice of the other enterprise. Of course, there are other ranches where sheep complement cattle because much of the range may be unsuitable for grazing by cattle.

As one would expect, more combination beef and sheep ranches were found in Areas 1 and 3 than in Areas 2 and 4. Also, with the exception of Area 1, as cow numbers increase the percentage of ranches incorporating a sheep enterprise decrease. The number of ranches with sheep in Areas 2 and 4 ranged from 0 to 15 percent with the lower percentages found in the larger size categories (Figure 5).

It is important here to note that in all categories in Area 3 the percentage of ranches incorporating a sheep enterprise ranged between 15 and 30 percent. Even more common is the combination beef and sheep ranch in Area 1. In all categories in Area 1 the percentage of combination beef and sheep ranches exceeded 30 percent and ranged upward to 50 percent in the 200 to 299 cow category. It becomes apparent to one that these areas have a large number of combination beef and sheep ranches and that this

population is indeed an important one in these areas. The relative importance of the sheep and cattle enterprises can be seen in Figures 6 and 7.

Certainly any researcher or other individual sampling or studying some aspect of agriculture in Areas 1 and 3 should be aware of this population. One would expect that the combination beef and sheep ranches might be organized quite differently than the pure beef ranch. An awareness of such populations is particularly important in many instances because of the high dependence of both enterprises on the range and hay resource.

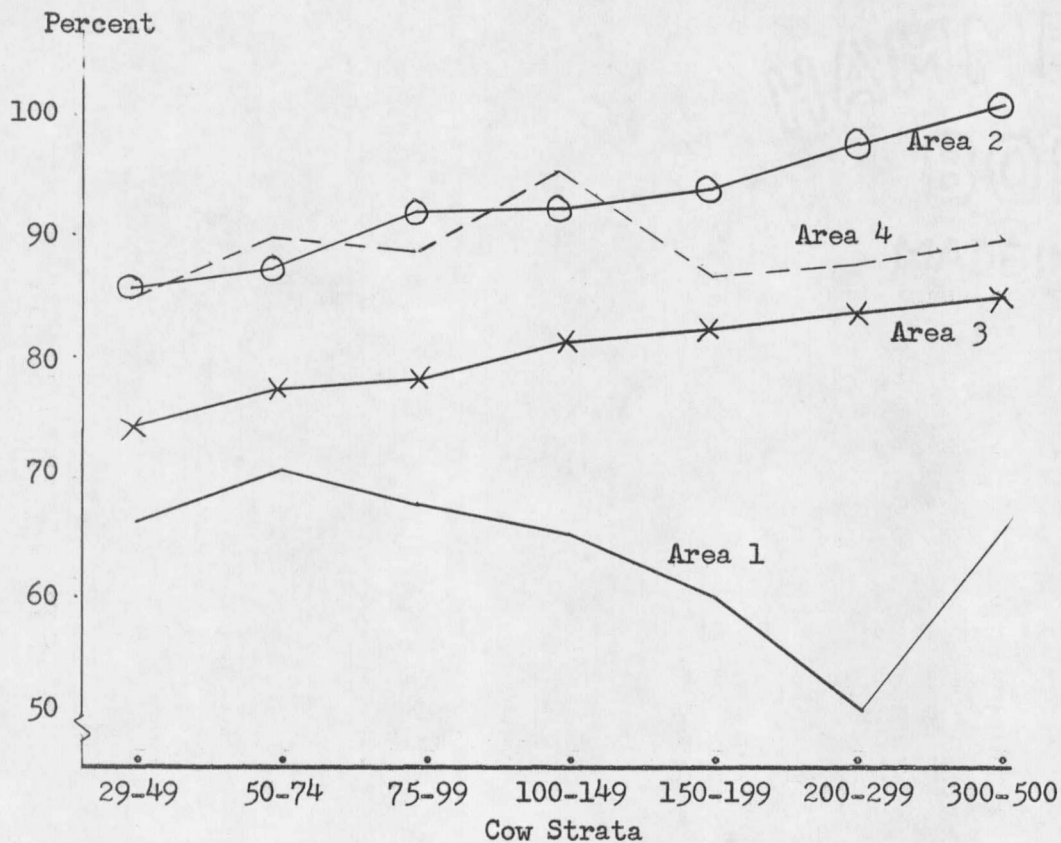


Figure 5. Percentage distribution of ranches having no breeding AU's of sheep per breeding AU of beef cow, by cow strata.

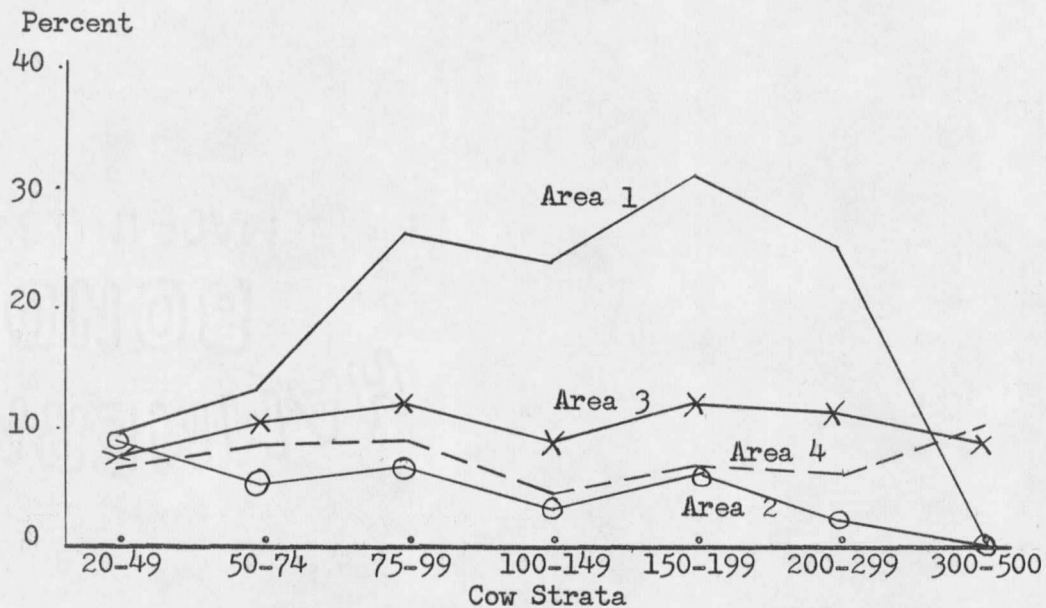


Figure 6. Percentage distribution of ranches having 0 to 0.5 breeding AU's of sheep per breeding AU of beef cow, by cow strata.

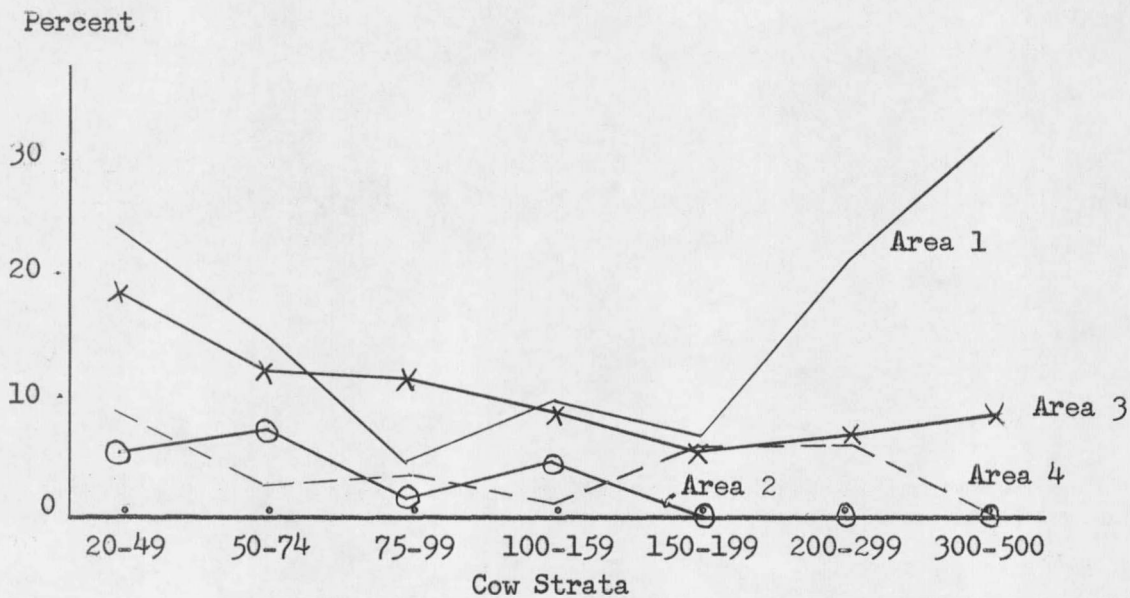


Figure 7. Percentage distribution of ranches having more than 0.5 breeding AU's of sheep per breeding AU of beef cow, by cow strata.

Swine.--Figure 8 shows the percentage distribution of beef ranches incorporating a hog enterprise. Hogs were cross-classified with beef cattle on the basis of litters farrowed. Ranch observations were sorted into two groups--those farrowing one litter or less and those farrowing more than one litter per year. Any hog enterprise involving the purchase and feeding of weaners was eliminated in this analysis.

One would conclude from the analysis that as cow numbers increase the percentage of ranches incorporating a hog enterprise tend to decrease. However, there are two unique exceptions to this generalization, namely those ranches having 150 to 199 cows in Areas 1 and 4.

In Areas 2 and 4, where there are more diversified irrigated farms than in Areas 1 and 3, a hog enterprise in conjunction with the beef enterprise occurs more frequently. In all cow categories except one, Area 4 has more combination hog and beef enterprises than the other areas. On the smaller beef ranches of Areas 2 and 4, hogs seem to be of some importance. The percentage of ranches incorporating a hog enterprise in conjunction with beef in these instances runs from 15 to 20 percent. However, on the whole, one must conclude that hogs do not play an important role on most beef ranches in southeastern Montana. Certainly in Areas 1 and 3 the combining of swine and beef enterprises on the same ranch is not a common practice. In most instances the percentage of ranches in these areas having hogs ranges downward from 10 percent.

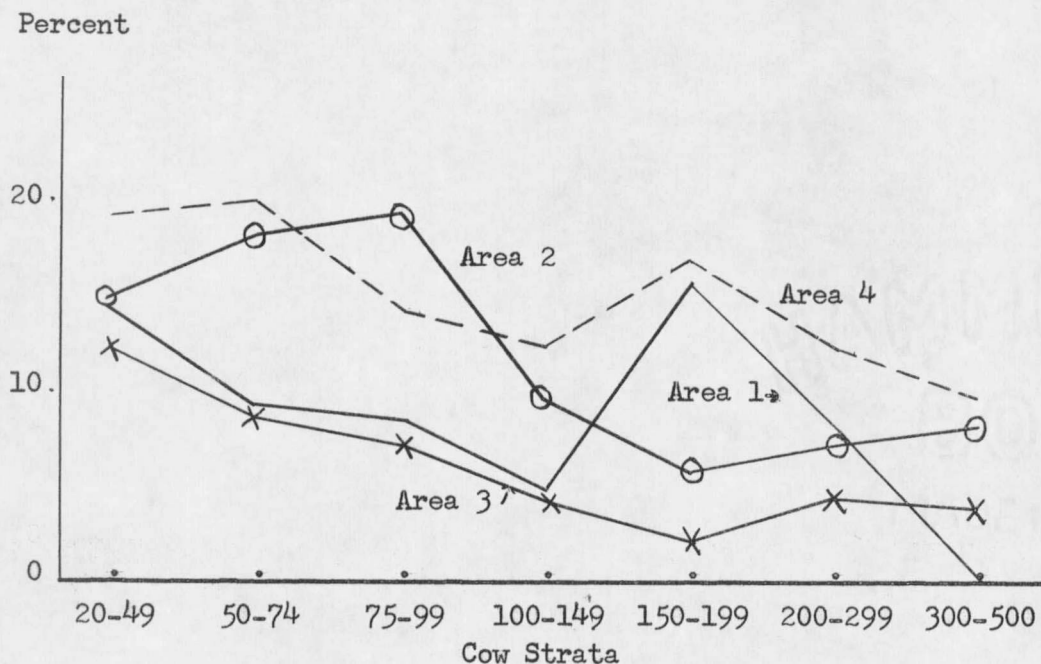


Figure 8. Percentage distribution of ranches farrowing more than one litter of hogs, by cow strata.

Dairy.--The identification of dairy enterprises in combination with beef ranches was accomplished by sorting the individual ranch observations into two groups--those ranches having five or less dairy cows and those ranches having more than five dairy cows.

It was felt that any ranch having no more than five dairy cows had these cows for the primary purpose of providing dairy products for home use. On a ranch having more than five dairy cows, the dairy enterprise would likely be a commercial operation supplementing other ranch income.

The results of this analysis revealed, as in the case of hogs, that the percentage of ranches having a dairy enterprise in conjunction with a beef enterprise declines as the size of the beef herd increases.

The reader should not be misled by the opposite trend that occurs in the last two cow stratifications of Area 1 (Figure 9). As was stated previously, distortions in percentage distributions are likely to occur when dealing with small numbers of observations. One observes when examining Table VI of Appendix A that there are only 23 and 6 ranches in Area 1 that have from 200 to 299 and from 300 to 500 beef cows, respectively. In the latter case, only one observation had more than five milk cows, (six to be exact), but this was enough to distort the picture considerably.

As in the case of hogs one would conclude, as a general rule, ranches having a commercial dairy enterprise in combination with a beef enterprise are few in southeast Montana. In the majority of cow categories the percentage of ranches having more than five milk cows is less than 10 percent and in one-half of the categories the percentage is less than 5 percent.

On the smaller beef cow ranches of Areas 2 and 4, combination beef and dairy enterprises are more common. This is as expected, because many diversified irrigated ranches are found in the Yellowstone Valley and most of the larger towns and cities of southeastern Montana are located in these areas.

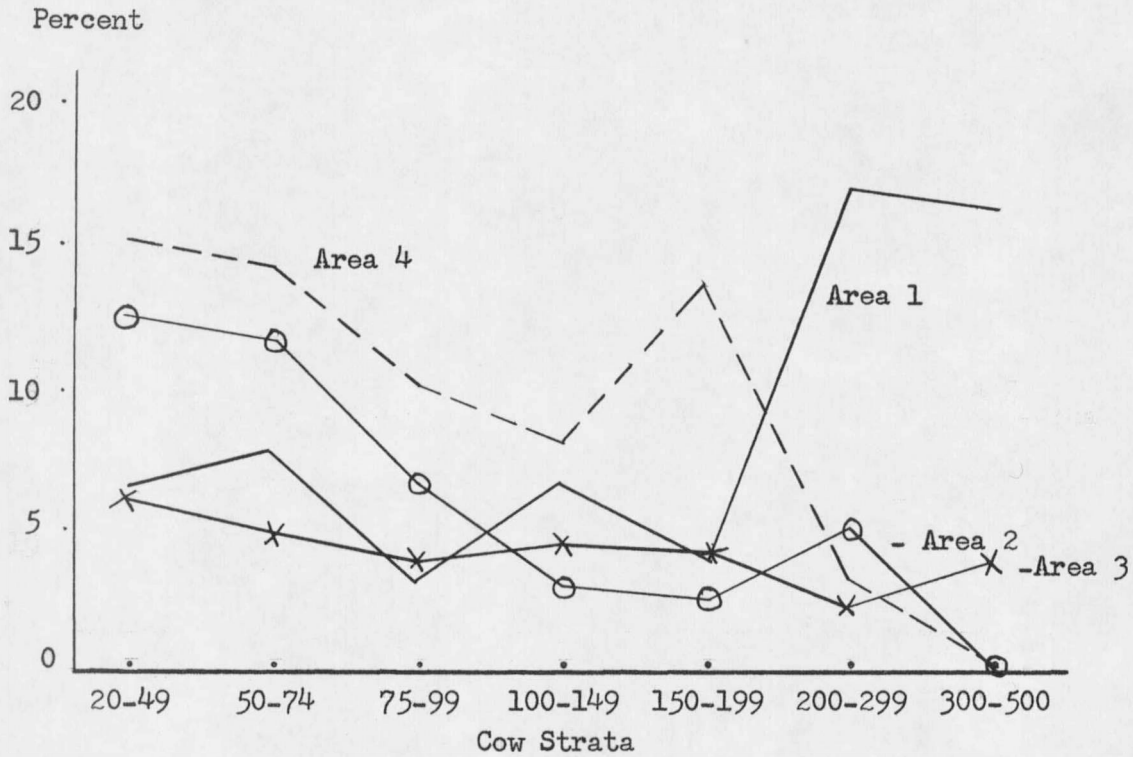


Figure 9. Percentage distribution of ranches having more than five dairy cows, by cow strata.

#### Crop Enterprises

Major sections of the beef industry in Montana are built or organized as combinations of cattle and cash crops. This is of greater importance in some areas than others, but one must examine and know how many such organizations we have in various areas to draw inferences resulting from changes in either the cattle or crop enterprises. They are very closely inter-related and the organization of these combination units is different from the organization of either a straight cash crop or straight beef unit.

All crops harvested.--The description of crops and their influence and importance on beef ranches is accomplished by looking at an aggregate of all crops harvested, and by then breaking this aggregate down and examining separately each major crop grown in the study area.

The first observations one makes when examining Figure 10 is that crop enterprises in combination with beef ranches are much more common than other livestock enterprises in combination with beef ranches. In only 3 of the 28 individual groups of ranches does the percentage of pure livestock organization or those having no cash crops harvested exceed 50 percent. Those three categories are the largest category in Area 2 and the two largest size categories in Area 3.

The first graph of each sequence on sheep, swine, and dairy tells the rest of the story in that very few of the 28 individual groups had even 25 percent other livestock. With the exception of Area 1, those cow number categories having no sheep exceed 70 percent. Those cow number categories having one or less litters farrowed all exceed 79 percent. With the exception of the two largest size categories of Area 1 those cow number groups having five or less dairy cows exceeded 84 percent.

The area that stands out in the analysis of all crops harvested is Area 4. The percentage of ranches harvesting more than 200 acres of crops (Figure 13) is the greatest for Area 4 in all cow categories, and in the first five cow categories of Area 4 the percentage of ranches harvesting more than 200 acres of crops is, in every instance, more than double that of any other area.

Further analysis and conclusions about crop enterprises in conjunction with the beef enterprise will be pointed out in the sections dealing with specific crops.

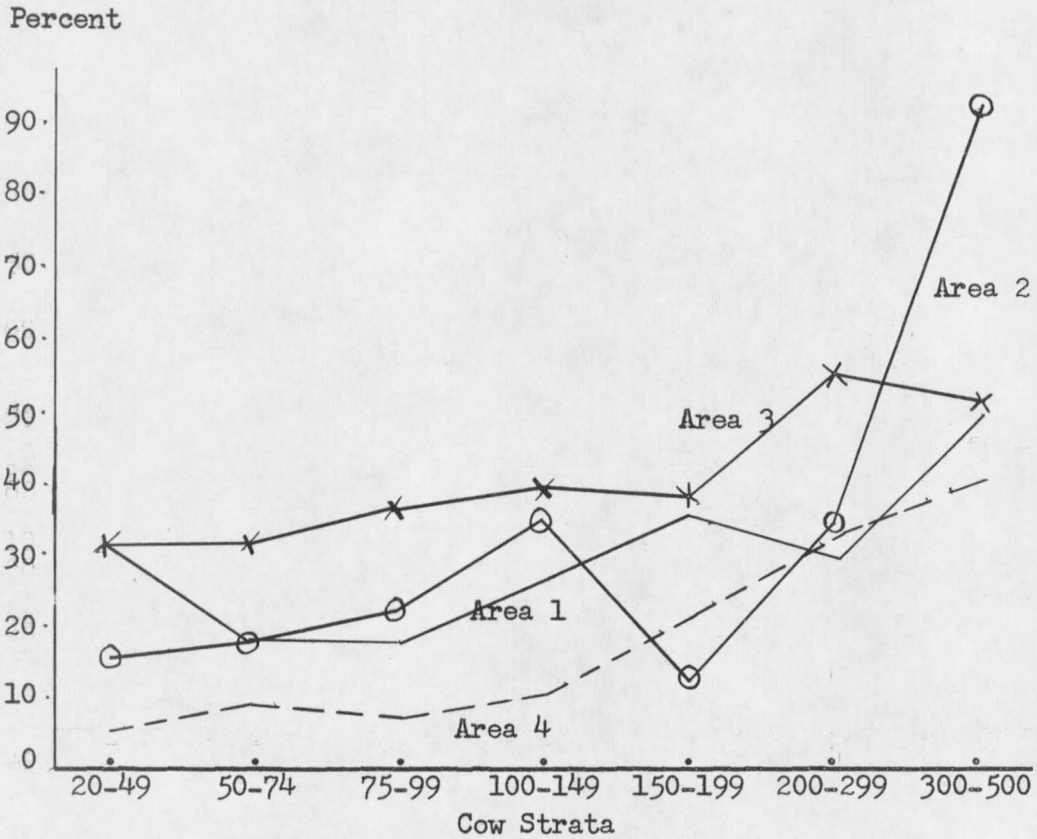


Figure 10. Percentage distribution of ranches having zero acres in all crops, by cow strata. (Excludes sugar beet acres.)

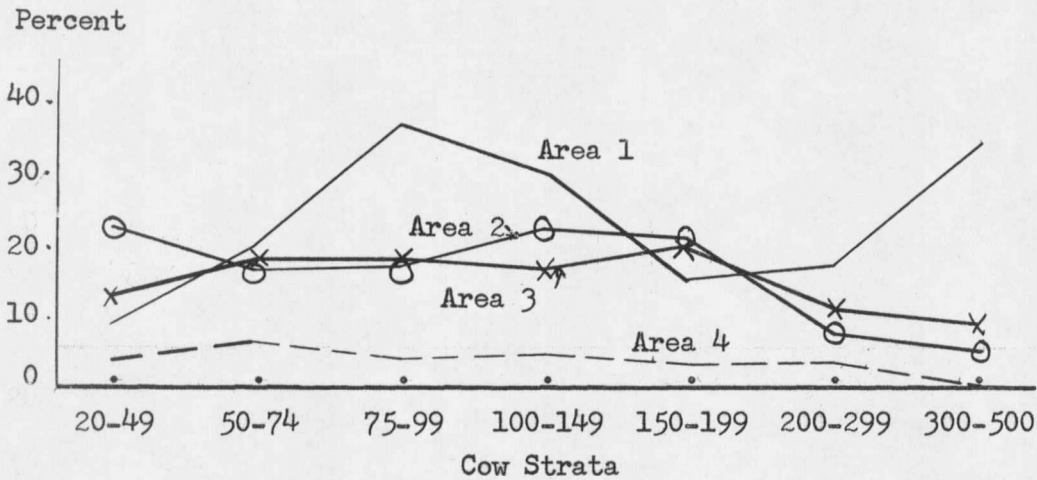


Figure 11. Percentage distribution of ranches having more than zero but not more than 50 acres of all crops, by cow strata. (Excludes sugar beets.)

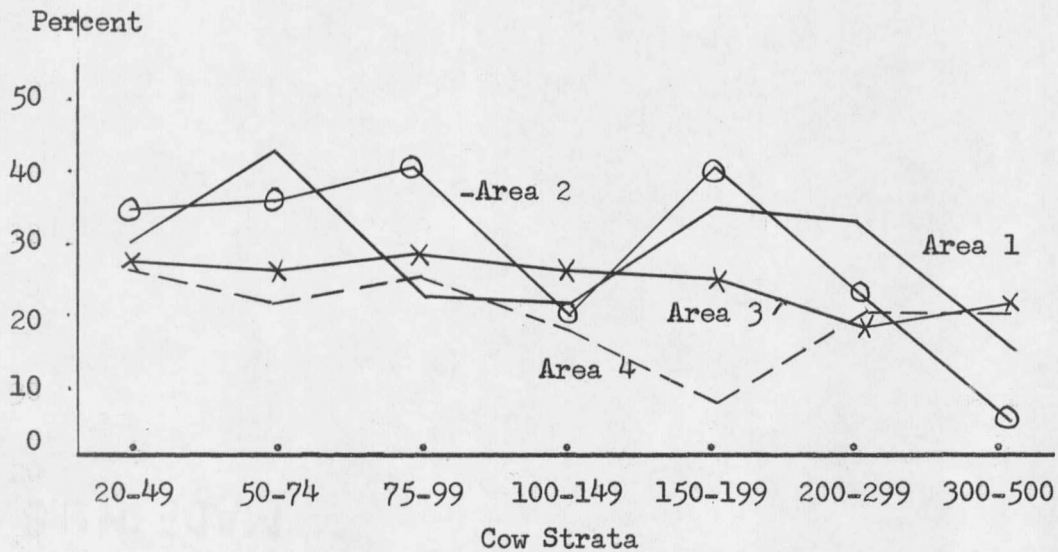


Figure 12. Percentage distribution of ranches having more than 50 but not more than 200 acres of all crops, by cow strata. (Excludes sugar beet acres.)

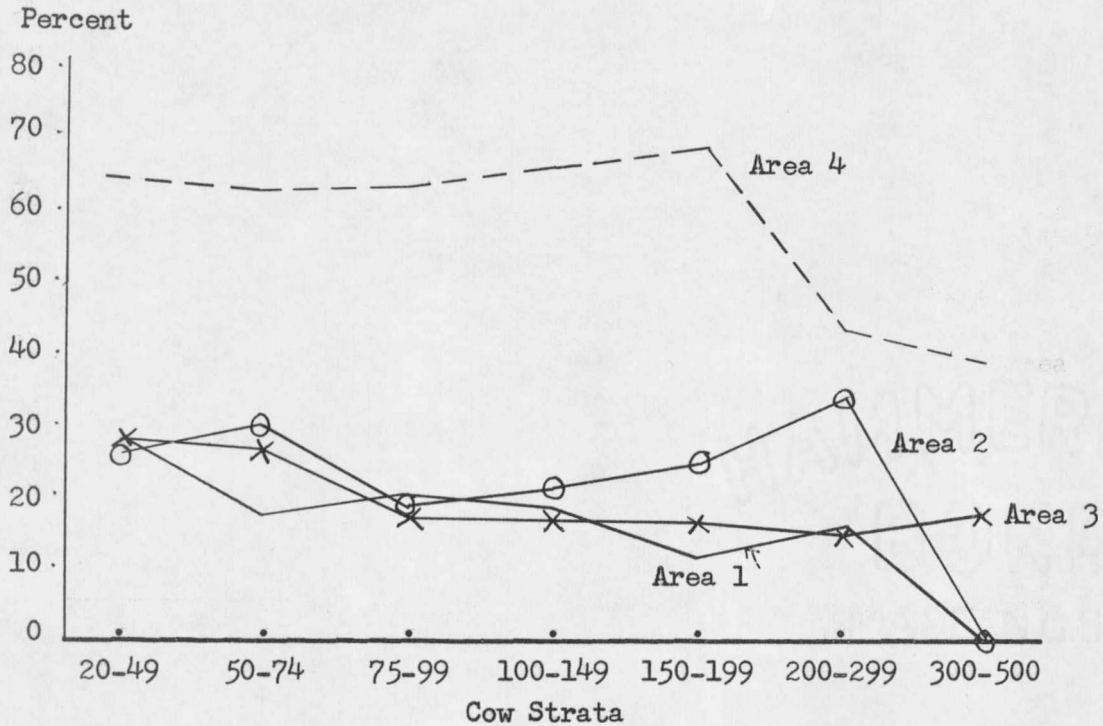


Figure 13. Percentage distribution of ranches having more than 200 acres of all crops, by cow strata. (Excludes sugar beet acres.)

All wheat.-- The most common enterprise found in combination with beef cattle ranches in southeastern Montana is wheat. The percentage of ranches not having a wheat enterprise exceeds 50 percent in only one-fourth of the 28 individual groups.

It is also interesting to note that of those ranches in Area 4 having 75 to 99 cows, 100 to 149 cows, and 150 to 199 cows, better than 50 percent harvested more than 200 acres of wheat (Figure 17). In the last two cow categories of Area 4 more than 30 percent of the ranches harvested in excess of 200 acres of wheat. It is evident from an examination of Figure 17 and Table VIII of Appendix B that large wheat enterprises in conjunction with large beef enterprises are common in both Areas 2 and 4. It











































































































































































