



Some size, income, and organization characteristics of the ranches of 46 Montana counties
by Leon C Michaelsen

A THESIS Submitted to the Graduate Committee in partial fulfillment of the requirements for the
Degree of Master of Science in Agricultural Economics
Montana State University
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Abstract:

This is a study of the size and income of the livestock ranches of 46 Montana counties. The discussion is limited largely to the totals for all counties with brief mention, of significant county and general area relationships, and includes an examination of the different kinds of ranch organization as related to each aspect of size and income included in the analysis. Most of the county data are listed in the appendix. The study includes 9150 livestock ranches of an estimated 10,144, or about 90 per cent of the range livestock producing units in the areas studied.

Considered as a group, the livestock ranches of Montana are smaller than the minimum requirements for an economic unit, and they produce an income which is too small to support a socially desirable level of living under Montana ranching conditions. Fifty-eight per cent of all ranches were smaller than 100 animal units per ranch, and slightly over two-thirds of the ranches received a net annual income of less than \$1000 by the data of this study.

The income and productive capacity was very unequally divided between large and small outfits with half of the ranches maintaining 90 per cent of total livestock numbers and receiving 86 and 82 per cent of the total gross and net income received by all ranches respectively.

Sheep ranches were relatively larger and received a higher income than either combination cattle and sheep ranches or straight, cattle outfits, the latter being smallest in size and receiving a relatively lower income than either of the others.

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OF THE RANCHES OF 46 MONTANA COUNTIES

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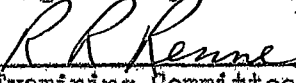
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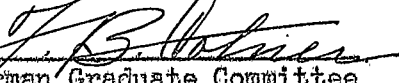
A ~~THESIS~~

Submitted to the Graduate Committee in
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for the Degree of Master of Science
in Agricultural Economics at
Montana State College

Approved:


In Charge of Major Work


Chairman Examining Committee


Chairman Graduate Committee

Bozeman, Montana
June, 1938

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ACKNOWLEDGMENTS

The author is indebted to M. H. Saunderson for his helpful suggestions of procedure and interpretation of the data of this study, and for his constructive criticism of the manuscript. Further credit is due the Works Progress Administration, Work Projects Numbers 804 and 1755, for assisting in gathering and compiling the data and preparing the charts.

SOME SIZE, INCOME, AND ORGANIZATION CHARACTERISTICS
OF THE RANCHES OF 46 MONTANA COUNTIES

PART I. ABSTRACT

This is a study of the size and income of the livestock ranches of 46 Montana counties. The discussion is limited largely to the totals for all counties with brief mention of significant county and general area relationships, and includes an examination of the different kinds of ranch organization as related to each aspect of size and income included in the analysis. Most of the county data are listed in the appendix. The study includes 9130 livestock ranches of an estimated 10,144, or about 90 per cent of the range livestock producing units in the areas studied.

Considered as a group, the livestock ranches of Montana are smaller than the minimum requirements for an economic unit, and they produce an income which is too small to support a socially desirable level of living under Montana ranching conditions. Fifty-eight per cent of all ranches were smaller than 100 animal units per ranch, and slightly over two-thirds of the ranches received a net annual income of less than \$1000 by the data of this study.

The income and productive capacity was very unequally divided between large and small outfits with half of the ranches maintaining 90 per cent of total livestock numbers and receiving 86 and 82 per cent of the total gross and net income received by all ranches respectively.

Sheep ranches were relatively larger and received a higher income than either combination cattle and sheep ranches or straight cattle outfits, the latter being smallest in size and receiving a relatively lower income than either of the others.

PART II. INTRODUCTION

Purposes and Objectives

The purpose of this study is two-fold; first, to determine the variation in the size, income, and some features of organization of Montana livestock ranches through an enumeration of them; and, second, to make this information available on a county basis for the different public agencies rendering services to the ranchers of any area, such as extension

workers and the management of public grazing resources to use in formulating their programs and defining their policies.

Specifically the objectives of this study are:

- (1). To determine the importance of livestock ranching to any area through an enumeration of the total gross and net income normally produced by the ranches of that area.
- (2). To determine the approximate welfare of the ranches of any area through discovering the number and proportion of ranches receiving various amounts of gross and net income from ranch enterprises.
- (3). To determine the number of the different sized ranch units in any area and the variation among the different kinds of ranches in this respect.
- (4). To determine the aggregate number of range livestock controlled by various size groups of ranches and through this estimate the relative importance of the different sized ranches.
- (5). To study general size of ranch characteristics and kind of ranch and area variations in this respect.

Sources and Characteristics of the Data

Data for this project were obtained from two sources: (1) The Fifteenth Census of the United States--this material was used for orienting the subject and for comparison with the primary data of the project; and (2) individual farm and ranch schedules prepared by the Montana Experiment Station and Bureau of Agricultural Economics, United States.

Department of Agriculture cooperating.

These latter data were compiled from secondary sources and show for the individual farm unit the location, acreage, average production and yield of wheat (1928-35), livestock numbers as of 1933 (this year is considered as an average year for livestock numbers in Montana), feed crops, and gross income from minor agricultural commodities. 1/ After these schedules were completed, they were checked for accuracy wherever possible with existing complimentary statistics and were examined for accuracy and completeness by individuals acquainted with the farmers and farming practices of the different areas. Corrections were made on these bases wherever mistakes were found. Although these data may be slightly inaccurate for some few individual units, it is generally felt that they are highly reliable in the aggregate.

It is estimated by those who compiled these data and use the farm schedules developed that there are records for 90 per cent of the farms and ranches in the dry farming and ranching sections of the state. The objective in developing these card data was to represent average conditions rather than "peak" or "trough" situations. In thus establishing

1/ Sources of data: Livestock numbers were procured from county assessment rolls, 1933, "corrected" statistically for "shortnumbering" by Mendenhall and compared and corrected on the basis of numbers listed by Forest Service, Drought Purchase and other sources. Wheat, flax, rye, potatoes and feed crops were obtained from AAA records and "Supplementary" income (sugar beets, peas, alfalfa seed, beans, turkeys, etc.) were obtained from processors, distributors, or marketing agents who had compiled these data and were willing to cooperate with the Montana Experiment Station and the Bureau of Agricultural Economics in giving access to their records. This information is compiled on the farm and ranch schedules used in this study.

a normal they provide a means for evaluating present conditions and future developments in the light of past experience.

Method of Procedure

The general method employed in this analysis was one of selecting all the ranches from the farm unit data of the Montana Experiment Station and by studying their size, income possibilities, and organization characteristics, determine what actually is the normal situation as regards these items. In other words, it is a partial (or almost complete) enumeration of the ranches in the areas studied in an effort to determine the limits and variation in ranch size and income. This is an important distinction with respect to this study as the statistics developed are in no way biased by attempted sampling, but endeavors rather to determine the characteristics of the ranches of Montana through an enumeration of them.

From the large number of farm unit schedules of the Montana Experiment Station and the Bureau of Agricultural Economics, the ranch records were selected from the farm schedules according to the following criteria which were set up and used in defining a ranch. First, in order to be classed as a ranch the unit must maintain at least 25 animal units of range livestock in excess of ranch requirement. 2/ And second, the

2/ Since the purpose of this study was to analyze ranch size and income from the data shown on the individual farm schedule, those items included on the schedule which would normally affect neither size nor income were eliminated in the process of tabulation. On this basis a uniform allowance of 3 animal units of meat animals and 6 dairy cows was made for each ranch. Also only horses in excess of uniform allowances per cultivated acre and per 100 animal units of livestock in the individual unit were included in this tabulation.

unit must receive at least two-thirds of its total gross income from range livestock enterprises in order to be classed as a ranching unit.

In selecting the ranches on the basis of these criteria, it was necessary to determine the gross annual income of all the farm and ranch units in the individual counties in order to select on an unbiased basis all the ranches in the county. The gross income for each individual unit was computed from the data shown on the farm and ranch schedules, namely, the livestock numbers, the average annual production of wheat (and some few other crops such as flax and rye), and the total income from other minor agricultural commodities. Different devices were used for each of these three items in computing the gross annual income for the purpose of selecting the ranches and for the subsequent income analysis.

For all classes of livestock it has been determined that long-time gross annual income will approach \$20 per animal unit under normal price relationships. ^{3/} The gross income from the different classes of livestock maintained on the unit was determined by reducing them to an animal unit basis and multiplying by this \$20 figure. For the crops listing average annual production on the ranch card a long-time average farm price was used to determine the total gross receipts from these commodities. The income from minor agricultural commodities was taken directly from the ranch schedules and used in computing the total gross income of the individual farming and ranching units. The ranches were selected on the basis

^{3/} Saunderson, M. H. and Chittenden, D. W., "Cattle Ranching in Montana," Mont. Agr. Expt. Sta. Bul 341, 1937, p. 10.

of a two-third majority of gross income from range livestock enterprises as computed in this way.

The sample selected included 9130 livestock ranch units located in 46 Montana counties. They were analyzed to determine their size, income and some few organization characteristics.

The size of ranch analysis was made on the basis of the number of animal units of range livestock comprising the ranch unit. The ranches were classified into twelve different size groups according to the number of animal units of range livestock maintained on the ranch unit and were analyzed and summarized on this basis. From this analysis has been determined the number of the different kinds of ranches and the number of the different kinds of range livestock in each of these twelve size groups, and the aggregate gross and net income produced by the ranches in each one of these size classes. This gives the size distribution of ranches, livestock, gross and net income and facilitates comparison of each.

For the purpose of differentiating between different types of ranch organizations with respect to their size and income, the ranches were classified as cattle, sheep, and combination (cattle and sheep) ranches on the basis of an 80 per cent majority (in animal units) of either cattle or sheep. 4/

The income analysis was carried out on both a gross and net income basis. The gross income to study the total productive capacity and the net income to study the level of living of the ranches. Both gross

4/ See definitions page 16.

and net income were computed from the data shown on the farm schedules through the use of statistically computed income figures and average prices. Each was summarized by five different sources; namely, beef cattle, sheep, horses, other livestock and crops. The method of procedure will be discussed in greater detail under a discussion of each in the text following.

The size, gross income, and net income of the livestock ranches was analyzed by each of cattle, sheep and combination ranches to determine the principal differences in each of these respects between the different kinds of ranch units. Also each was summarized by counties, types of farming areas and state (46 counties). The data in the manuscript following shall attempt to indicate salient differences between the different kinds of ranches of each of the items discussed, pointing out significant county and area relationships and presenting charts and tables to indicate general trends and tendencies. Some data which would be cumbersome to present in the text on a county basis are shown in the form of type of farming area summaries and the county data listed in the appendix.

Limitations of Data and Procedure

For the purpose of showing normal size, income and some organization characteristics these data are regarded as adequate. However, it is recognized that there are certain limitations to the data and to the method employed in the analysis. Both are the best it was possible to obtain with the facilities at command for this study.

Though the data on these ranch schedules represent all the major agricultural enterprises of the state, the possibility that the information for some minor commodities may not have been obtained in some individual cases would limit the authenticity of this information somewhat. However, it is felt that the amount of error due to this possibility is not great because of the fact that every effort was made to procure this information, and because the ranches of the state in general have little income from minor agricultural enterprises.

Another possible source of error in the income figures is the use of statistically computed constants in their derivation (for income from livestock). However, they were developed from averages to represent averages and the figures evolved will have to be weighed in terms of the constants used in their derivation.

Definition of Terms and Areas Studied

Before proceeding further into this study, certain terms need to be defined and explained since they will be used frequently and an understanding of them will make both reading and explanation more effective.

An animal unit (A.U.) as used in this study is a unit for purposes of comparison and represents an average cow or the equivalent in other livestock as determined by appropriate conversion factors. ^{5/} The animal unit (A.U.) herein refers only to the range livestock maintained on the ranch that could probably enter into producing income (as explained

^{5/} Animal Unit equivalents = 1 beef cow = 1 A.U.; 1 dairy cow = 3 A.U.; 1 horse = 1/3 A.U.; 1 hog = 1/3 A.U.; 1 sheep = 1/5 A.U.

previously, page 11, footnote 2, allowances were made for home consumption of meat and milk and ranch requirements for horses).

A ranch as used in this study is a range livestock producing unit which has a minimum of 25 animal units of range livestock in excess of requirements for home consumption and work stock, and on which two-thirds or more of the total gross income is from range livestock enterprises.

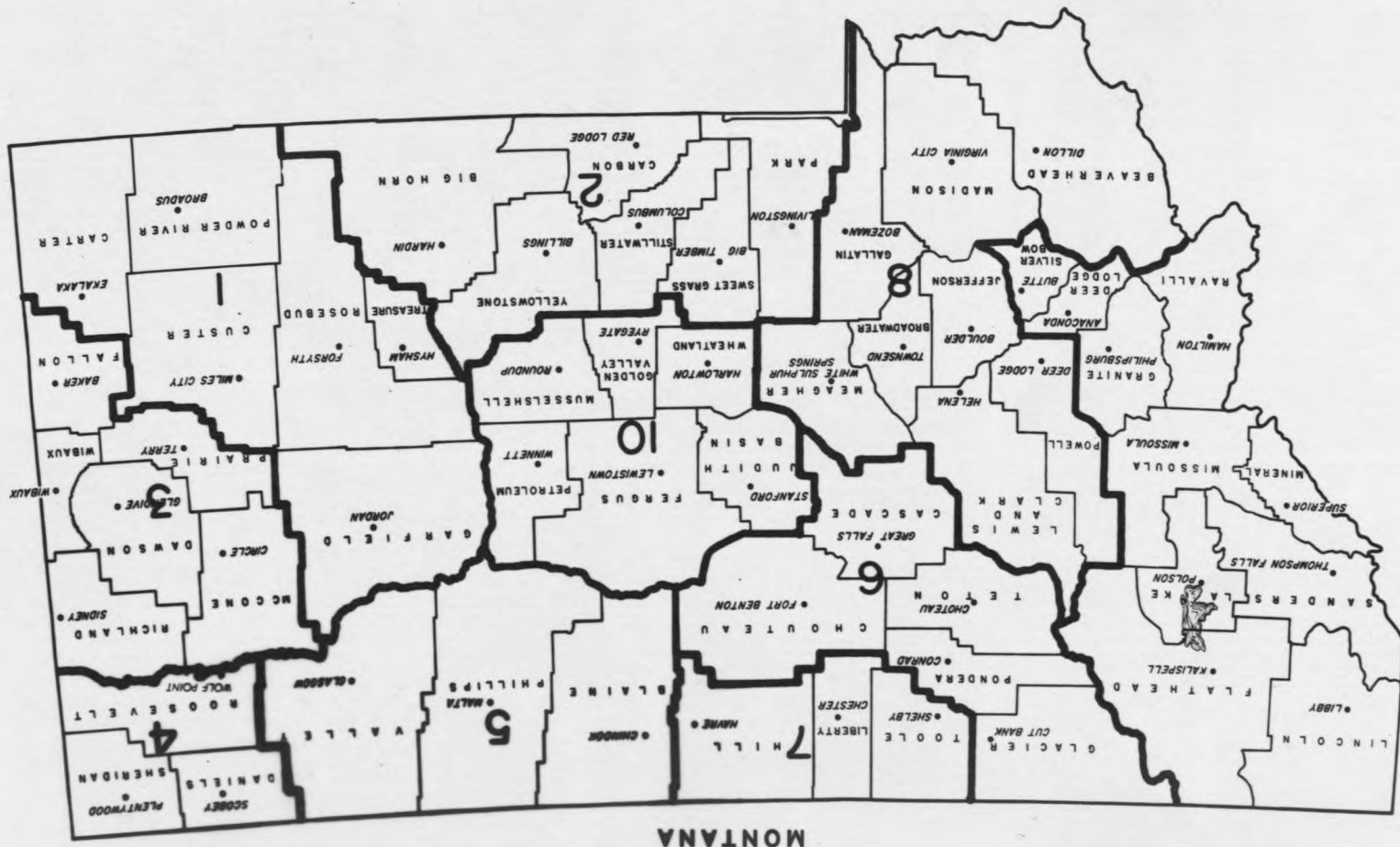
A cattle ranch herein refers to that ranch on which at least 80 per cent of the livestock (in A.U.) are cattle or horses.

A sheep ranch refers to that ranch on which at least 80 per cent of the total number of livestock (in A.U.) are sheep or horses.

A combination ranch refers to that ranch where neither cattle nor sheep is in an 80 per cent majority.

Type of farming area. This study will frequently resort to presenting data which would be cumbersome on a county basis and which can be adequately illustrated by general types of farming areas, of which there are 9 included in this study, designated and outlined as shown in figure 1. The different types of farming areas embrace a number of counties having many similar characteristics. The physical environment of the area, the prevailing type of farming, and the problems involved in agricultural readjustment are approximately alike. They are however, too extensive to exhibit a high degree of uniformity in the organization of farms and ranches. Figure 1 shows also the 46 counties included in this study.

Figure 1.--Counties and types of farming areas included in this study.



PART III. MONTANA LIVESTOCK RANCHING

Ranches Characterized

Strictly range outfits are scattered widely over all of Montana. They vary in size somewhat according to location in the fertile plains, along the foothills, or in the mountains. The opportunity for acquiring and using range and the extent of the competition from other uses and users affect the size of unit to a great extent in different locations. In general the smaller units are found in the plains regions where the land is subject to use for other purposes than grazing. The largest units are found in the mountainous regions in the western part of the state where topography and early settlement patterns favor the development of rather large outfits. Forest Service policy has had a stabilizing influence upon maintaining the units in this region at fairly large sizes. In all counties where there are Indian lands or forest lands, the units are larger in size than in the surrounding counties, possibly indicating the effect of the tendency for these agencies to lease to the larger units.

Ranch organization and practices vary considerably according to location in the high mountain valleys, the foothills area and the plains region. Differences in topography, vegetation, land control, climate, and opportunity for diversification greatly affect the organization of the units of these different areas. Cattle predominate in the south-central part of the state, and sheep in the north-central. The units in the counties located in the northeastern corner are smallest and most

diversified. Cattle are found in combination with wheat farming to a greater extent than sheep.

In spite of the wide distribution of stock ranches, the bulk of Montana livestock is concentrated in the foothill and low mountain country east of the continental divide. This area contains the best grass ranges of the state. West of the continental divide upland ranges are brushy, providing less desirable range conditions. The weed and browse ranges available on the national forests of this area are utilized more for sheep than for range cattle.

Importance of Ranching in Montana

Two definitions of ranches are considered in indicating the importance of ranching in Montana. The first is the census definition that a ranch is that unit which receives 40 per cent or more of its total gross income from range livestock enterprises. (This includes both livestock ranches and animal specialty farms by census definition, both of which are usually considered as livestock ranches.) The second definition is the same as used in this study; namely, that a ranch is that unit upon which two-thirds or more of the total gross income received is from range livestock enterprises.

Considering the latter designation first, the Department of Agricultural Economics, Montana State College, credits the range livestock industry in Montana with furnishing an estimated 59 per cent of the state's total gross income from farms and ranches during the 5-year period,

1928-32. This percentage varied from 50 per cent in 1928 to 76 per cent in 1931. 6/

By the census definition of a ranch, 20.7 per cent of the total number of farms listed for Montana in the census year 1930 were listed as livestock ranches or animal specialty farms. By this same source they controlled 49 per cent of all land in farms, 20.7 per cent of all crop land harvested, 39.1 per cent of all plowable pastures, and 65.6 per cent of all other pastures.

In terms of agricultural expenditures the ranches and animal specialty farms bought, 56.9 per cent of all feed purchased and 11.8 per cent of all fertilizer, and paid 49.5 per cent of all states' agricultural expenditures for farm labor during the year 1930.

Also the 1930 census indicates that 40.6 per cent of the total value of all products sold, traded or used by the operators family was furnished by the ranches and animal specialty farms and that 42.2 per cent of all taxable property including land, buildings, machinery, equipment, and livestock were on these units.

Thus in summarizing these aspects of the importance of ranching to Montana as indicated by the 1930 Census, the 20.7 per cent of farms that were stock ranches (1930) controlled 49 per cent of all land in farms, possessed 42.2 per cent of all taxable property and produced about 40.6 per cent of the total value of all goods produced by Montana farms and ranches.

6/ op. cit. Johnson, N. W. and Saunderson, M. H., 328, p. 56.

Relation of Livestock Ranches to Wheat and to
Combination Wheat and Livestock Farming

In order to more specifically relate ranching to other types and kinds of farming, eight counties located in the plains and foothills regions of Montana were selected and all the farms and ranches listed by the card data of the Montana Experiment Station were segregated and analyzed to determine the most prominent relationships between the different types of farms. 7/

Three types of farms were considered; namely, wheat farms, livestock ranches, and combination wheat and livestock farms. They were selected and classified on the basis of a two-thirds majority of gross income from either of the two major commodities. The combination unit was that unit producing wheat and livestock, neither of which comprised two-thirds of total gross income. Each of the other two types of units received at least this proportion from the major commodity.

These units were then analyzed to determine the relationship between number of farms (or ranches), number of livestock, acreage and production of wheat, and the income production and status of each type of farm.

Analysis of these data (table I) indicated that the livestock ranches comprised 35.7 per cent of all the farms and ranches analyzed, that they had 74.6 per cent of all livestock, produced 3.1 per cent of all

7/ Counties analyzed included Custer, Sweetgrass, McCone, Daniels, Phillips, Teton, Hill and Fergus.

TABLE I. AVERAGE NUMBER OF FARMS, LIVESTOCK, PRODUCTION OF WHEAT,
AND GROSS INCOME BY 3 TYPES OF FARMS—
8 MONTANA COUNTIES

Type of Farms	Ranches		A.U. of Livestock*		Bushels of Wheat**		Gross Income***		Av. Gross Income
	No.	%	No.	%	No.	%	Amt.	%	
All Farms	6917	100	429,637	100	9,574,515	100	\$16,252,352	100	\$2360
Stock Ranches	2469	35.7	320,464	74.6	301,286	3.1	6,650,309	40.9	2694
Combination Farms	1258	18.2	70,795	16.5	1,597,712	16.7	2,694,070	16.6	2142
Wheat Farms	3190	46.1	38,378	8.9	7,675,517	80.2	6,907,973	42.5	2166

* 1935 figures (crop census cards)

** Three, 5 and 8 year average yields (1928-36) (crop census data)

*** Computed @ \$20 per A.U. of Livestock and \$.80 per bu. of wheat.

TABLE II. AVERAGE NUMBER OF A.U. OF LIVESTOCK, ACREAGE, PRODUCTION,
AND YIELD OF WHEAT BY TYPE OF FARM—8 MONTANA COUNTIES

Type of Farm	No. A.U.*	Acres of Wheat**	Prod. Wheat (bu.)*	Yield of Wheat per Acre
Average of All Types	62	161.8	1364	8.6
Livestock Ranches	130	20.6	122	5.9
Combination Farms	56	183.9	1270	6.9
Wheat Farms	12	262.3	2406	9.2

* 1935 figures (crop census cards)

** Three, 5, and 8 year average acre and yields (crop census data)

wheat produced, and 40.9 per cent of the total gross income. Census data indicated that the total number of farms and ranches included in this analysis amounted to about 75 per cent of the entire number in these counties (6917 as compared with 9253 as listed by the 1930 census). Since very few irrigated farms were included in this analysis, the probability is that this includes practically all of these types of farms located in these counties.

Table II indicates the existing differences in the organization of each of these three types of farms. It shows the average number of livestock and the average acreage, production and yield of wheat on each of these three types of farms. It indicates a gradual blend in organization from a straight livestock to a straight wheat producing unit.

Despite the fact that livestock ranches produce a larger gross income per ranch than either wheat or combination farms (Table I), these data indicate that a larger percentage of those units classed as livestock ranches were in the low income groups than either of the other kinds of farms. Table III shows these data for each type of farm. It will be noted that a higher percentage of ranches was in both the highest and lowest income groups. Combination farms show a healthy status in this respect, compared with either stock ranches or wheat farms, having only 28.5 per cent of combination ranches below \$1000 gross annual income. Perhaps the combination is an effective hedge in protecting income.

TABLE III. PERCENT OF 3 TYPES OF FARMS BY 4 GROSS INCOME CLASSES
(8 MONTANA COUNTIES)

Gross Income	Per cent of Farms and Ranches by Type			
	All Types (6917)	Stock Ranches (2469)	Combination Farms (1258)	Wheat Farms (3190)
All Classes	100	100	100	100
Under \$1000	35.6	41.1	28.5	34.4
\$1000-\$4999	54.7	45.7	65.0	57.6
\$5000-\$10,000	7.4	8.8	5.2	7.1
\$10,000 & over	2.3	4.4	1.3	1.0

Number, Kind and County Distribution of Livestock Ranches

This study is an approach to a full enumeration of all the ranches in the 46 counties included in this study. No complete listing of farms and ranches is available. The 1930 Census lists for the 46 counties considered in this study, a total of 8610 animal specialty farms and stock ranches, compared with a total of 9130 as found by this study. Since the census includes in either these two designations all range livestock producing units receiving 40 per cent or more of their total gross income from range livestock enterprises, it should logically list a larger number of ranches for the same area than this study, because of the fact that this study includes only those units which receive two-thirds or more of total gross income from these sources. However, analysis indicates that the census listed only 94 per cent of the total number listed by this study.

It is estimated by the staff of the Montana State Experiment Station that the card data include 90 per cent of the farms and ranches in the dry farm and ranching areas of the state.

The farm unit data of this project indicates that in terms of numbers alone, cattle ranches are of much greater importance than either sheep or combination ranches. Of the 9130 ranches, 6402, or 70.1 per cent, were cattle outfits, 1577, or 17.3 per cent, were sheep ranches, and 1151, or 12.6 per cent, were combination ranch units (figure 2).

Figure 3 shows the county distribution of livestock ranches by kind of ranch for the 46 counties included in this study. Carter and

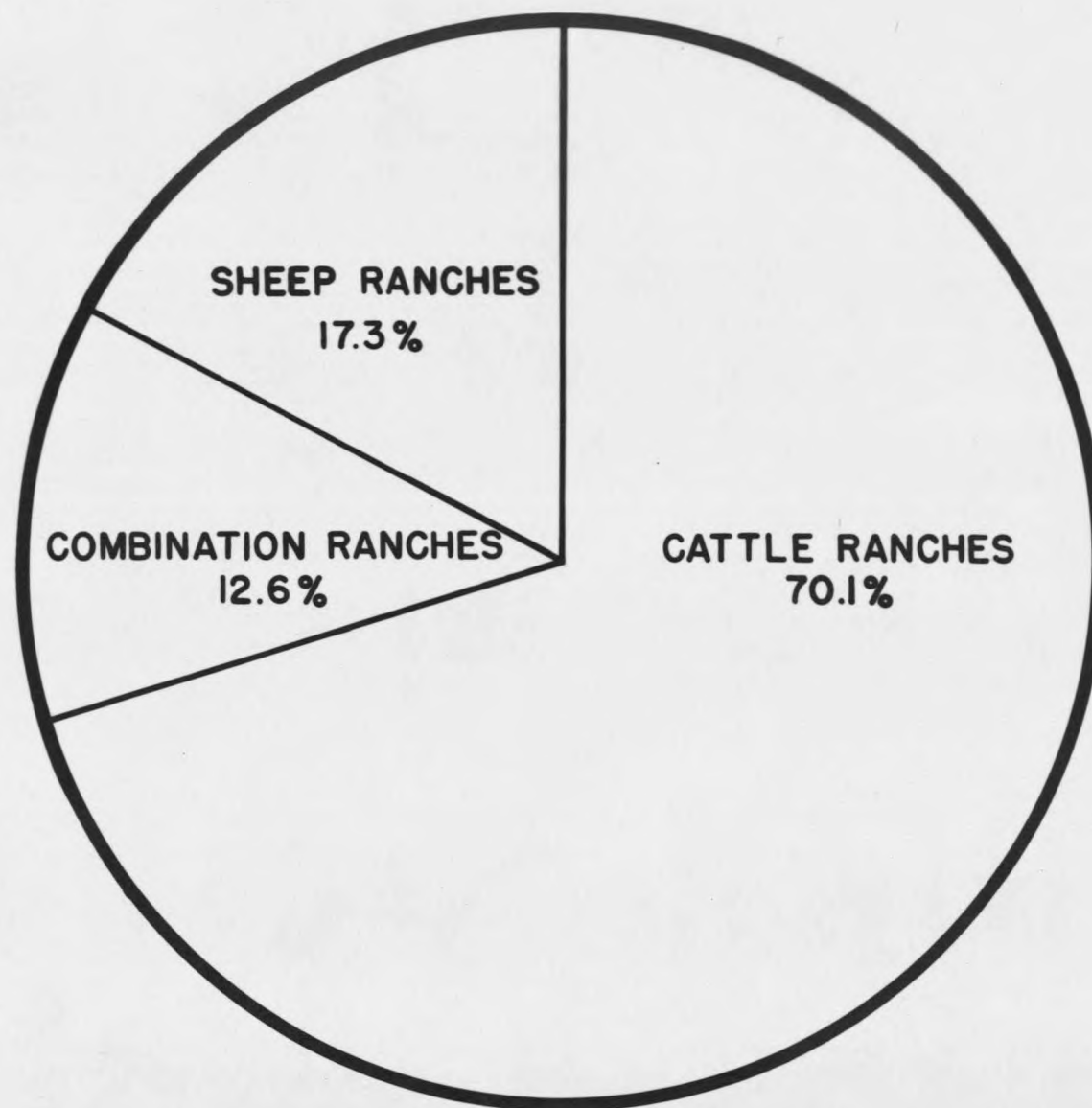


Figure 2.--Kind of livestock ranches in Montana.*

*Based on a study of the organization of 9130 livestock ranches in 46 Montana counties.

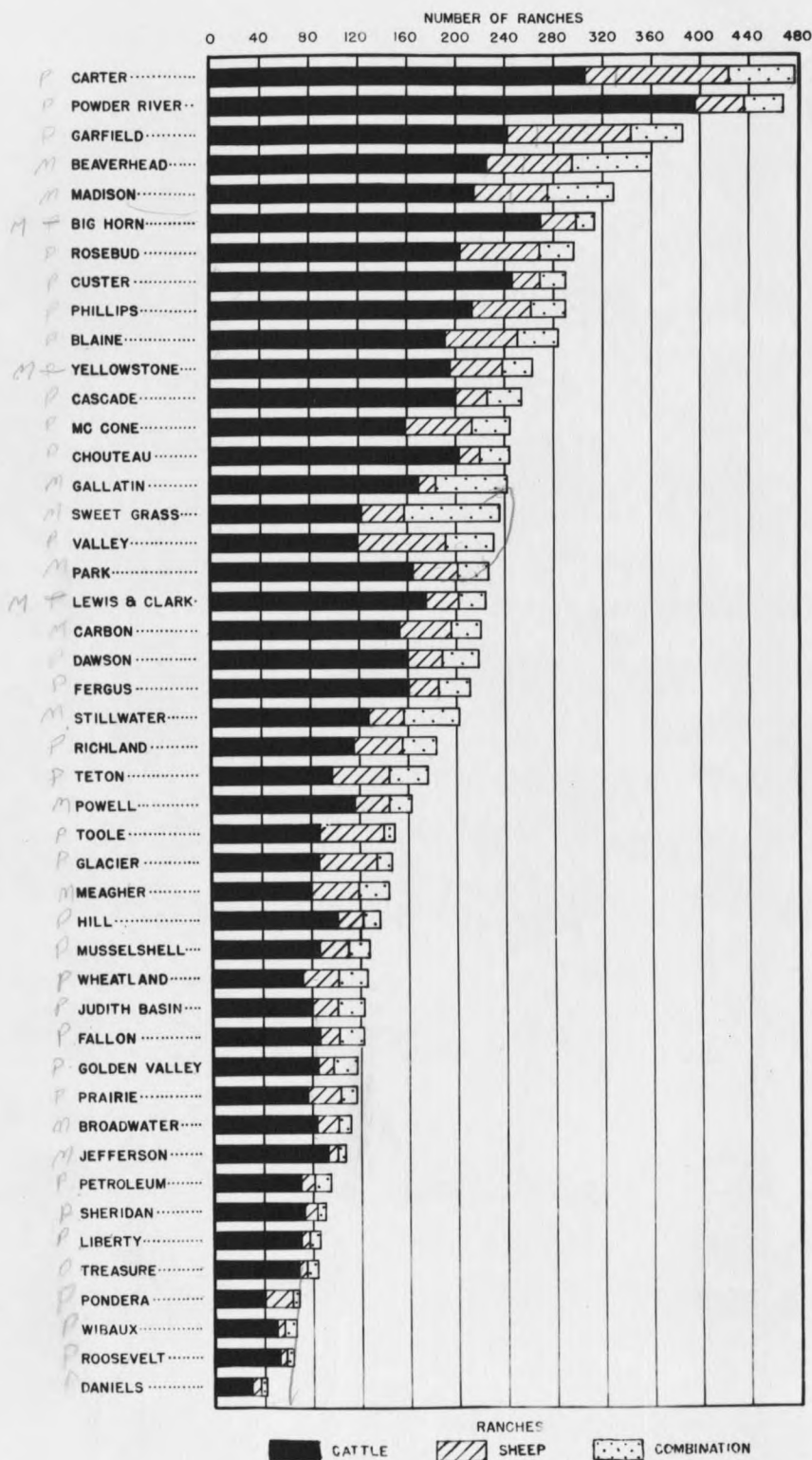


Figure 3.--County distribution of livestock ranches by kind of ranch--46 Montana counties.

Powder River counties had by far the greatest number of ranches with 477 and 468 respectively. Garfield was next with a total of 385. Twenty-three of the 46 counties have over 200 livestock ranches, whereas only 8 counties have fewer than 100. The counties with the largest number of ranch units are in the southeastern and southwestern part of the state, and the counties of fewest number in the northeast corner. Powder River County had the most cattle ranches with a total of 396, Carter the largest number of sheep outfits with 118, and Sweetgrass County the most combination ranch units with 79.

Number, Kind and County Distribution of Range Livestock

Montana livestock are found on farms of all types and kinds. It is estimated by the Department of Agricultural Economics, Montana State College, that 69 per cent of Montana beef cattle and 86 per cent of the sheep are found on ranches. ^{8/} According to the farm record data of this study there was in 1933 a total of 1,712,260 animal units of range livestock other than ranch living and work requirements on ranch units. Of this total number 56 per cent were beef cattle, 43.1 per cent sheep, and .9 per cent horses (see figure 4). The seemingly small number of horses is due to liberal allowances for farm and ranch work and due to tabulating horses on the basis of one horse is equal to one-third animal unit. In terms of feed requirements a horse is equivalent to about one animal unit, but in terms of income, as was the purpose in this analysis, a horse was

^{8/} Johnson, Neil W. and Saunderson, M. H., "Types of Farming in Montana", Mont. Agri. Expt. Sta. Bul. 328, 1936, p. 56.

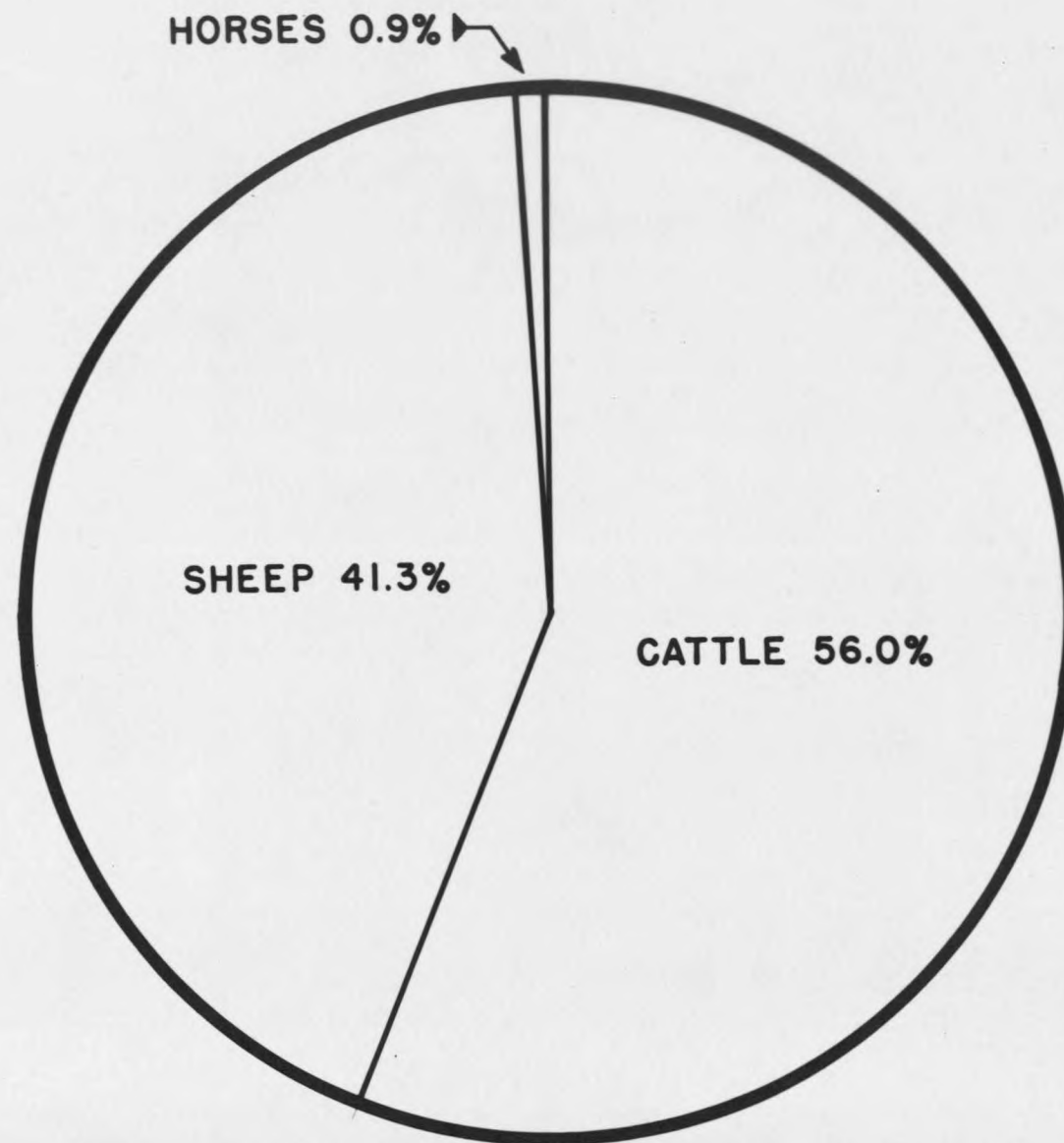


Figure 4.--Gross income relationship of range livestock on Montana ranches.*

* Based on a study of the gross income from different classes of range livestock on 9130 Montana ranches.

considered as one-third animal unit.

Figure 5 shows the county distribution of range livestock on an animal unit basis as taken from the individual farm record data of the Montana Experiment Station. Reference to this figure will indicate that the total number of animal units in Beaverhead County was about twice the number in Big Horn, the county of next importance in this respect. Beaverhead had a total of 166,089 animal units, Big Horn, 94,550, and Powder River was next with a total of 71,766. There were eleven counties with more than 50,000 animal units and five with less than 10,000. Beaverhead and Big Horn counties had the greatest number of cattle; Beaverhead and Glacier the greatest number of sheep, and Custer the most horses.

PART IV. INCOME OF MONTANA LIVESTOCK RANCHES

Objectives

One of the major purposes of this study was to construct an income series for the livestock ranches including a determination of the total amount of gross and net income produced by all the ranches of any area and the total number of ranches receiving various amounts of gross and net income from ranch enterprises. The first is a measure of the importance of ranching to any area through showing the total amount of money produced by the ranches and presumably used by these ranches for the purchase of commodities and paying public service charges within that area. The second is a measure of the welfare or level of living possible for the ranches to maintain from ranch enterprises.

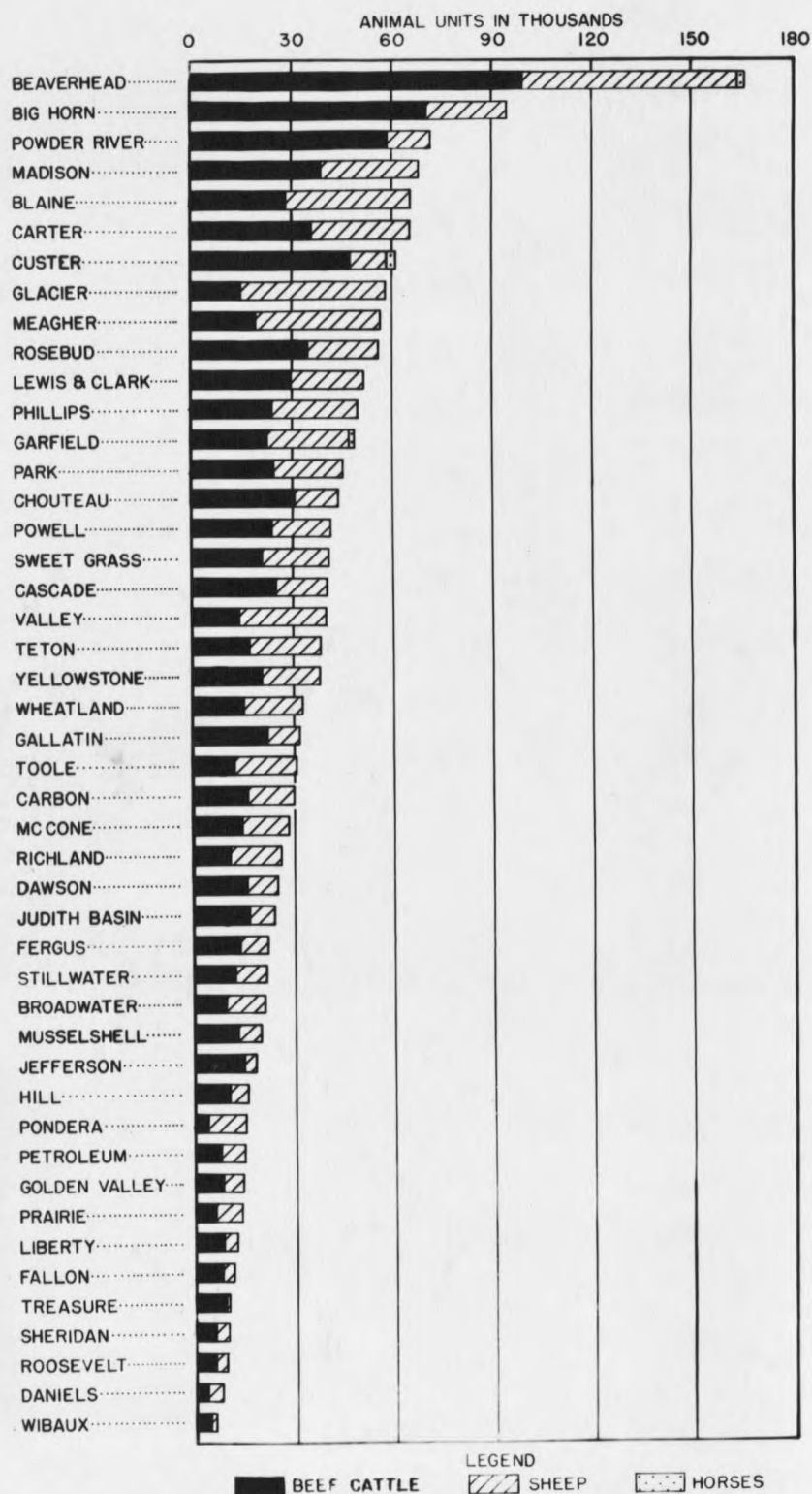


Figure 5.--County distribution of range livestock by kind of livestock--46 Montana counties.

Besides indicating these items, the ranches were analyzed to determine the general characteristics of all ranches with respect to amounts, sources and distribution of income and the differences in these respects between different kinds of ranches. The analyses were carried out on both a gross and net income basis and will be presented in each form.

Gross Income

Definition.--Gross income was computed as described under methods of procedure (page 12) and represents for the individual ranch unit, the total income from the sale of crops, livestock and livestock products insofar as this money return is represented by statistically calculated returns per unit of livestock normally maintained on the ranch and per unit of crop normally marketed insofar as these data were obtained and represent the true normal in each of these respects. It is a calculated total income from the sale of primary agricultural commodities as of a normal or average year. The attempt to represent a normal or average situation is an important objective in an area of such violent annual extremes as is characteristic of most of Montana's ranching areas.

Plan of Presentation.--Gross income will be discussed under three general headings: (1) income produced, showing the total amount of income produced by all ranches; (2) income status, showing the number of ranches receiving various amounts of gross income; and (3) general income characteristics showing the differences in amounts and sources of gross income between different kinds of ranches.

Gross Income Produced by All Ranches.—The aggregate gross income produced by the ranches of any area represents the amount of money produced by the ranches and used by the operators to purchase supplies and equipment, to pay labor and interest charges, and to pay tax and school assessments. It is the aggregate amount of money produced by the ranches and used to support different agencies and institutions within the area.

Analysis of the gross income data indicated that the 9130 livestock ranches have an income probability from ranch enterprises of \$35,280,048. The total amount of income produced by the ranches of each county is shown in the appendix (Table A) by the five sources of income and will not be discussed in the text other than to mention that in general the counties in the southwest and southeastern parts of the state show the largest aggregate gross income from the ranches in those areas.

Gross Income Status.—For the purpose of analyzing the gross income status of the livestock ranches, 35 Montana counties were selected and the ranches were classified according to size of gross income into seven different income groups. 9/ The general import of this analysis is that an extremely large proportion of ranches receive a relatively small gross annual income.

Figure 6 shows the distribution of ranches by 7 gross income classes for all the ranches in the 35 counties included in the analysis of gross income distribution and for each kind of ranch. This figure indi-

9/ Counties selected for analysis of income status included all the counties in types of farming areas 1, 2, 3, 6, 8, and Daniels, Phillips, Fergus, and McCone counties.

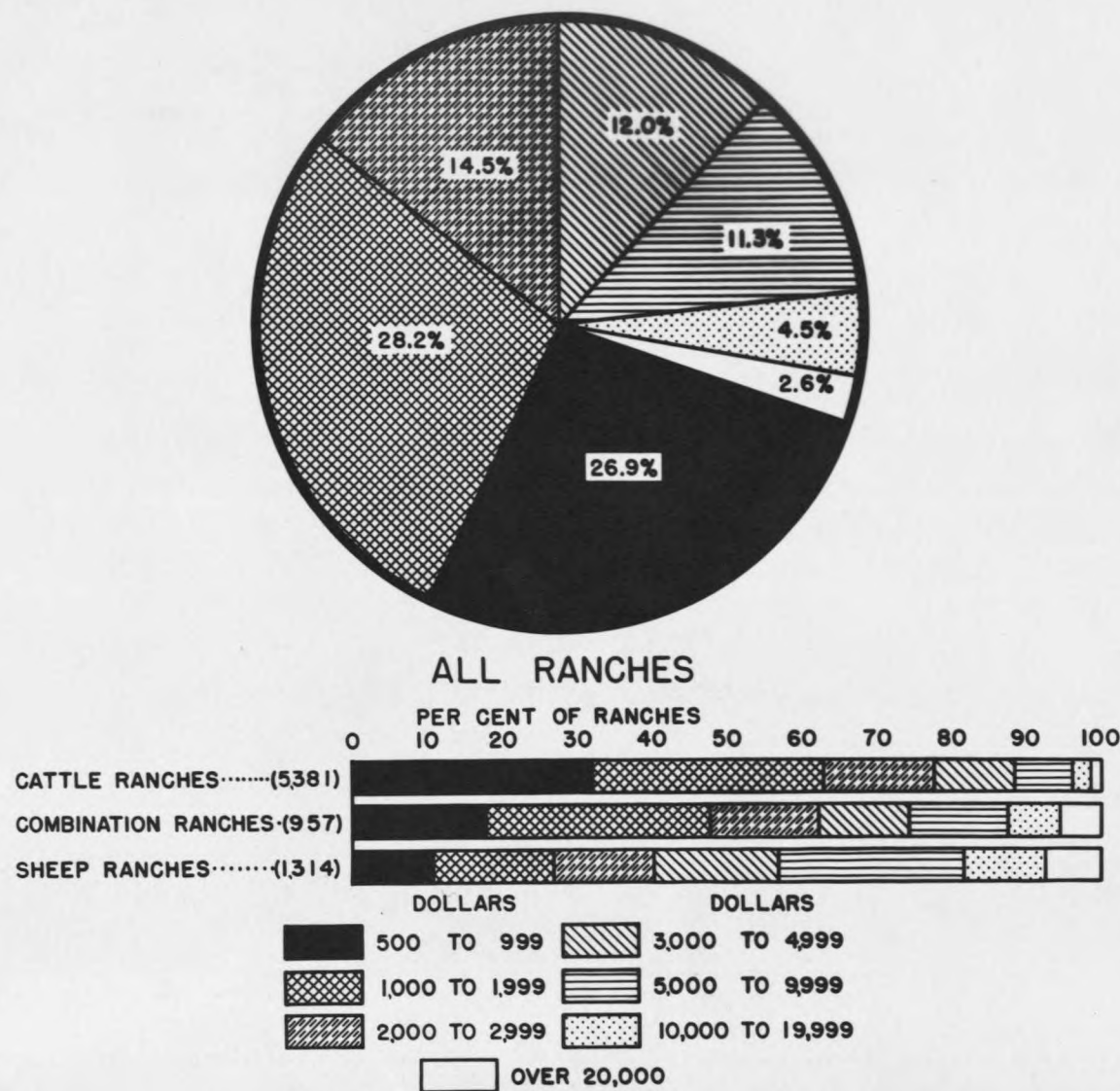


Figure 6.--Percentage of Montana livestock ranches receiving different amounts of gross income from ranch enterprises.*

* Based on the gross income of 7652 livestock ranches in 35 Montana counties.

cates that a large proportion of all ranches receive a small gross annual income. It shows in round numbers that 27 per cent of all ranches received less than \$1000 gross annual income from ranch enterprises, that 70 per cent maintained an income of less than \$5000 and that 7 per cent of the ranches showed an income probability of over \$5000 annually.

By this same figure a larger proportion of cattle outfits were in the low income groups than either of sheep or combination ranches. Thirty-two per cent of all cattle ranches showed a gross annual income of less than \$1000, compared with 18 per cent of all combination ranches and 11 per cent of all sheep outfits. Among the higher income groups 4 per cent of all cattle outfits, 13 per cent of all combination ranches, and 18 per cent of all sheep ranch units received a gross annual income exceeding \$5000.

Figure 7 shows the percentage distribution of ranches by 5 gross income classes for the ranches of 35 Montana counties. Examination of this figure will indicate that an extremely large proportion of the ranches in these counties was in the two smallest income groups. Treasure and Beaverhead counties represent the two county extremes in the distribution of gross income. In Treasure County 44.6 per cent of all the livestock ranches of that county received less than \$1000 gross annual income from ranch enterprises. In Beaverhead County only 14.7 per cent of all the units received less than \$1000 annually. Among the higher income groups Beaverhead and Wibaux counties represent the two county extremes. In the former county 40 per cent of all ranch units received over \$5000 gross annual income and in the latter county there was no unit which received over this amount by

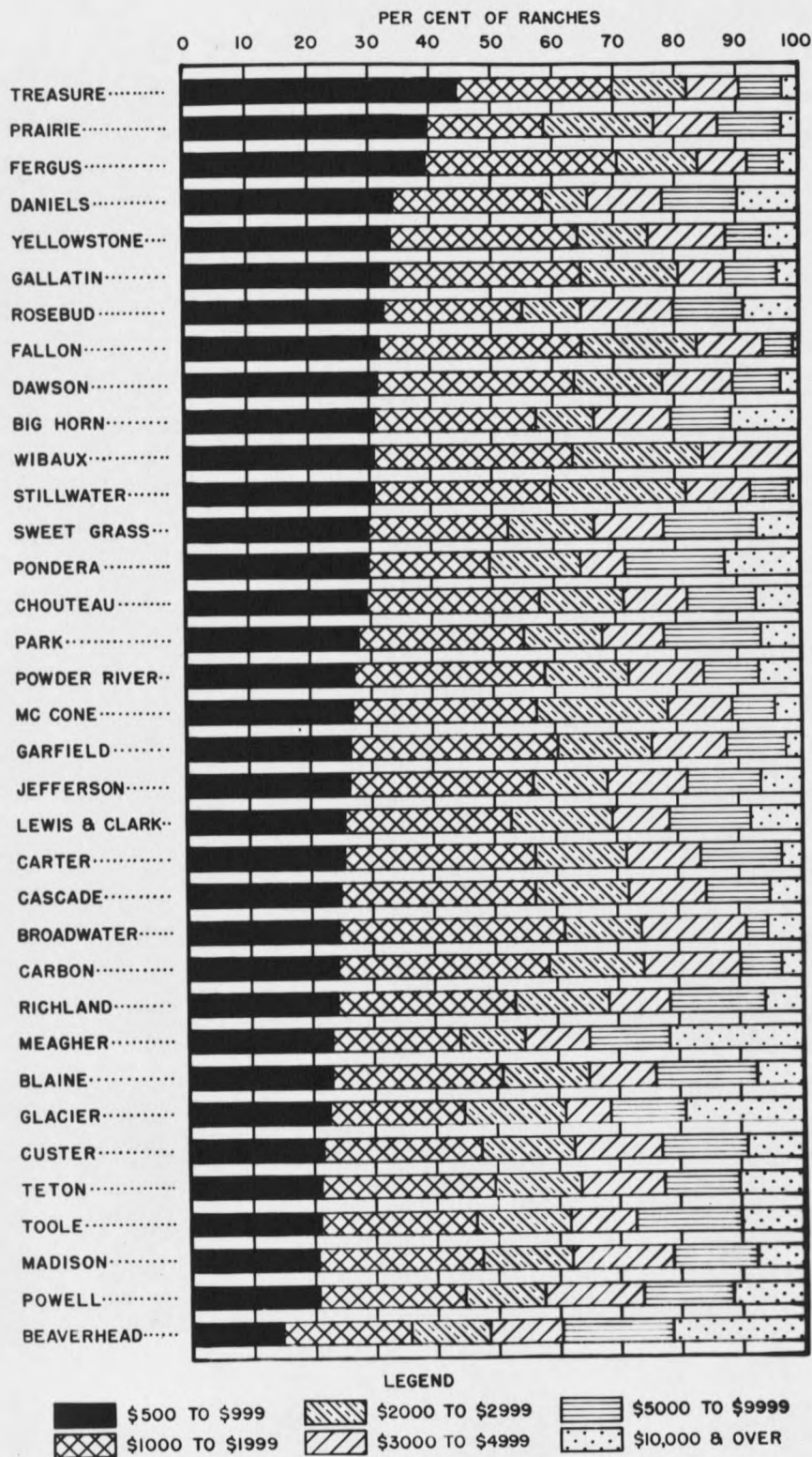


Figure 7.--Per cent distribution of ranches by 6 gross income classes--35 Montana counties.

the card data of this study.

Distribution of Gross Income by Kind of Ranch.--Table IV shows the percentage of ranches classed as cattle, sheep, or combination ranch units and the estimated percentage of total gross income received by each kind of ranch. By this table it will be seen that cattle ranches received the largest amount of gross income but not in proportion to their number and that each of the other kinds of ranches received a greater than proportional share of total gross income.

Distribution of Gross Income by Source.--Figure 8 shows the distribution of gross income by the five different sources for which data were available in this study. This figure indicates the extremely large proportion received from range livestock and suggests that Montana livestock ranches are highly specialized in their enterprises. Beef cattle are the largest single source of income and sheep next. These data are shown in the appendix on a county basis (table A). In 32 counties the gross income from beef cattle was greater than from any other source and in the remaining 14 of the 46 counties sheep were the most prominent source of income. The counties in which the largest proportion of gross income was from cattle were located in the southeastern part of the state. Sheep was the most prominent source of income in the counties in the north central portion of the state. The counties in the northeastern section of the state show the largest proportion of gross income from sources other than range livestock but in no case did it amount to over 16 per cent of the total gross income from all sources.

TABLE IV. PER CENT OF RANCHES AND TOTAL GROSS INCOME
BY KIND OF RANCH

Kind of Ranch	Per cent of Total Number (9130)	Per cent of Total Gross income* (\$35,280,048)
Cattle	70.1	47.1
Sheep	17.3	31.9
Combination	12.6	21.0

* The total gross income produced by all the ranches in each of twelve different size groups was divided by kind of ranch according to the percentage of ranches in each group that was cattle, sheep, or combination ranch unit.

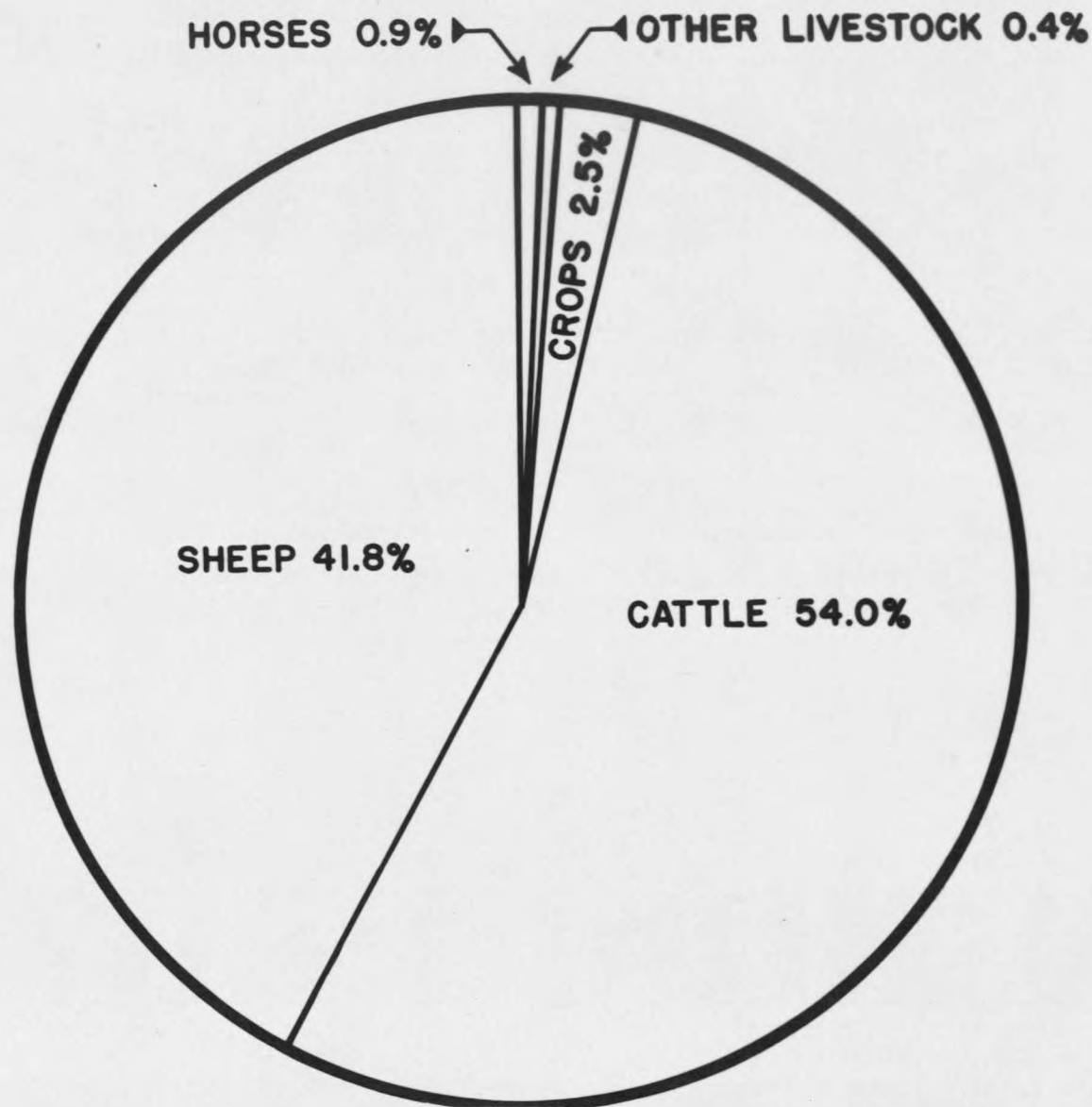


Figure 8.--Sources of income on Montana livestock ranches.*

* Based on a study of the amount of income received from five sources by 9130 livestock ranches located in 46 Montana counties.

Analysis of the data regarding the number of ranches with income from each of four different sources, indicated, insofar as these data cover all available sources, that 78 per cent of all ranches were on a strictly range livestock base, that 15.4 per cent had some income from range livestock and crops, that 4.6 per cent had income from range livestock and other livestock, and that the remaining 2 per cent had income from all three sources (table V).

These data indicated relatively little difference among the different kinds of ranches with respect to the percentage of the total number of each kind of ranch having income from these different sources. Sheep ranches showed the highest percentage of ranches with income from range livestock alone and combination ranches the smallest with 82.7 per cent and 71.8 per cent, respectively. Combination ranches indicated the largest percentage from all other sources and sheep ranches the least (table V).

Distribution of Gross Income by Size of Ranch.—With respect to certain sized ranches being more diversified than others, these data indicate that a larger percentage of the units between 50 and 150 A.U. per ranch procured some income from sources other than range livestock than was characteristic of the ranches of any other size groups (table VI). This table shows for each kind of ranch the percentage of the total number of ranches in each of six general size groups with some income from sources other than range livestock. It indicates the tendency for units of 50 to 150 animal units to diversify to a greater extent than other sizes, for larger units to specialize more in range livestock production

TABLE V. PERCENTAGE OF CATTLE, SHEEP,
AND COMBINATION RANCHES BY SOURCES OF INCOME

Source of Income	All Ranches (9130)	Cattle Ranches (6402)	Sheep Ranches (1577)	Combination Ranches (1151)
Range Livestock only	78.0	77.9	82.7	71.8
Range livestock and crops	15.4	15.4	13.3	18.9
Range livestock and other livestock	4.6	4.7	2.9	6.8
Range livestock, other livestock and crops	2.0	2.0	1.1	2.5

TABLE VI. PERCENTAGE OF CATTLE, SHEEP, AND COMBINATION RANCHES
WITH INCOME FROM SOURCES OTHER THAN RANGE LIVESTOCK
BY 6 SIZE CLASSES OF RANCHES

Size Classes (In A.U.)	All Ranches	Cattle Ranches	Sheep Ranches	Combination Ranches
25 - 50	17.9	18.2	9.0	21.4
51 -100	26.7	27.1	16.2	32.7
101-150	26.6	26.1	23.5	33.6
151-300	22.2	21.3	19.7	32.2
301-500	18.1	18.1	15.6	23.4
Over 500	15.2	8	17.8	20.3

as the size of the ranch increases, and for the smaller units to be less diversified (and probably less specialized) than either of the other groups. These small units probably have additional sources of income not here included, such as outside labor, since a unit of this size seldom offers full-time employment for the operator.

Analysis of the gross income data by different size groups of ranches indicates that a large proportion of total gross income was produced by a small proportion of the larger ranch units. Table VII shows the cumulative percentage distribution of all ranches and of aggregate gross income by 12 size groups of ranches. Beginning with the largest size class (over 3000 A.U.) this table shows that of the total 9130 ranches included in this study, .4 per cent were greater in size than 3000 A.U. per ranch and that this .4 per cent of all ranches received 9.8 per cent of the total gross income produced by all ranches. Further, it indicates that of all ranches, 13.7 per cent were greater in size than 300 A.U. per ranch and that this 13.7 per cent of all ranches produced 56.7 per cent of the total gross income produced by all ranches. By this table the smallest 29 per cent of all ranches produced only about 6 per cent of the total gross income produced by all ranches. This indicates that a small proportion of the larger units acquire an extremely large proportion of total gross income.

Net Income

Purpose and Procedure.—The purpose of analyzing the net income of the ranches included in this study was: (1) to determine the total

TABLE VII. CUMULATIVE PERCENTAGE DISTRIBUTION OF RANCHES AND
AGGREGATE GROSS INCOME BY 12 SIZE CLASSES OF RANCHES
(9130 MONTANA LIVESTOCK RANCHES)

Size Classes of Ranches (In A.U.)	Ranches (9130)	Gross Income (\$35,280,048)
25-50	100	100
51-100	70.6	94.2
101-150	41.9	82.8
151-200	28.6	73.8
201-300	21.8	67.5
301-500	13.7	56.7
501-750	6.9	42.8
751-1000	3.8	32.9
1001-1500	2.5	27.2
1501-2000	1.3	19.5
2001-3000	.8	14.7
Over 3000	.4	9.8

amount of money normally produced by all the ranches of an area and available for the satisfaction of family living requirements; (2) to determine the approximate number and proportion of the ranches of the different sections of the state included in this study that are normally able to satisfy their living requirements from ranch enterprises in an acceptable manner, that is, to analyze their level of living; and (3) to determine the general net income characteristics showing differences in the amounts, sources, and distribution of net income by kind of ranch.

In making these analyses it was necessary to determine first how to compute net income from the data shown on the ranch schedules, and second to determine approximately the net income requirements of a satisfactory level of living under Montana ranch conditions. Because of the wide variation among ranches and ranchers this attempt was made through a determination of the average net income from various sizes and types of ranch organization and the average family living requirements. Consequently, the results are approximations for average conditions and do not give recognition to unusual operators or ranch practices or of the variation in the living requirements of different ranchers and their families.

In the text following net income is defined and the computation explained to give the reader a basis for evaluating the statistics developed. This is followed by a discussion of net income characteristics as to amounts, sources, differences between different kinds of ranches, etc., and concluded by an analysis of the level of living possible to Montana ranches through comparing the proportion of ranches receiving various

amounts of net income from ranch enterprises with standard of living requirements established by other investigators.

Net income as herein used is the average net farm income insofar as this income is represented by calculated net returns per productive animal unit of range livestock maintained on the ranch and per unit of crop sold. It is the difference between ranch expenses and ranch receipts and does not include interest on investment or operator and family labor.

Because no cost and income data were available and it was desired that a net income analysis be made of the livestock ranches, it was necessary as in the case of deriving gross income from the data shown on the ranch schedules to determine a fair average net return per unit of livestock maintained on the ranch and per unit of crop sold. In doing this, use has been made of available studies. 10/

Saunderson says, "A study of ranch operating budgets shows that for the small or family-sized ranch of 100 to 150 A.U., the income available for family living expenses will at average prices amount to about \$8.00 a unit of cattle run through the year and \$1.00 to \$1.50 a ewe (\$5.00 to \$7.50 per A.U. of sheep)." 11/ He continues elsewhere by saying that, "Four dollars for the medium-sized cattle ranch unit of 200 to 300 A.U. and \$3.00 per A.U. on large units of 300 to 600 A.U."

10/ Saunderson, M. H., "Economic Changes in Montana Range Livestock Production", Mont. Agr. Expt. Sta. Bul. 311, p.18.
Schwann, H. E., "A Study of Economic and other Problems Involving Allocation of National Forest Range in Beaverhead and Madison Counties, Montana", U. S. D. A. Forest Service Report.
Unpublished Data of The Home Economics Dept., Montana State College, 1934.

11/ Saunderson, M. H., op. cit., 311, p. 18.

would be applied to family living expenses under "normal" price relationships." ^{12/} With these observations, based on examination of production records, as a beginning, a series of constant average net incomes per animal unit for different sizes of ranches and different kinds of livestock were developed.

Some of the principal things taken into consideration in developing these "constants" were: (1) differences in labor requirements between cattle and sheep, and between different sizes of ranches. Sheep generally require more labor per animal unit than do cattle because of necessity for constant herding and care, and larger ranches require more hired labor, thus reducing the amount of income per unit of stock that is available for family living purposes; (2) long time average expenses and incomes; (3) efficiency of operation; and, (4) available comparable statistics. ^{13/}

Through comparison and analysis of the above data and sources, a net income per animal unit of cattle and sheep, which varied as to size of ranch and between different kinds of livestock, was computed and used in the calculation of net farm income. It is assumed for the purposes of this study, that the ranches would net an income per productive animal unit, beginning on the smaller sheep units at \$6.25 and on the small cattle unit at \$8.00 and graduated downward as the size of the

^{12/} Schwann, H. E., op. cit., Section III, p. 28.

^{13/} Schwann cites Production Credit Association literature in which use is made of labor income figures comparable with the constants used in this study. Schwann, op. cit., Appendix p. 14.

ranch increased. 14/

On the basis of these derived constants, a sheep ranch of 500 head would normally net about \$625 a year with which to pay interest charges and use for family living purposes. On the same basis, a sheep unit of 1500 head would net about \$1650, provided there were no income from other sources. A cattle ranch of 100 head would, on the same basis, net \$800 and one of 300 about \$2100.

Constants used for other sources of income were; for horses, \$10 per A.U. for all sizes of ranches; for income from livestock other than range livestock and for crop income one-half total gross income was used.

On these bases a net income series was constructed for the Montana livestock ranches included in this study. A total net ranch income was derived for all the ranches and was summarized on a county basis for each of the 48 counties studied; and, the ranches of 35 counties were classified as to amount of annual net income derived from ranch enterprises

14/ Constants used in calculating net farm income from numbers of sheep and cattle. Assumed net income per A.U. of sheep and cattle maintained on the ranch, by size classes.

<u>Size in A.U.</u>	<u>Sheep</u>	<u>Cattle</u>
25-50	\$6.25	\$8.00
51-100	6.25	8.00
101-150	6.00	8.00
151-200	5.50	7.00
201-300	5.50	7.00
301-500	5.00	7.00
501-750	5.00	6.00
751-1000	4.00	5.00
1001-1500	3.75	5.00
1501-2000	3.50	4.00
2001-3000	3.30	4.00
Over 3000	3.00	4.00

(insofar as these data show same) for the purpose of approximating and comparing the possible level of living of these ranch units.

Amounts and Sources of Net Income.—Summary of the net income data computed as described above indicates that the entire 9150 livestock ranches produced an aggregate net annual income of \$10,355,516 or an average of \$1134 per ranch. However this arithmetic average does not show the true picture because of the inherent weakness of the arithmetic average in characterizing a skewed distribution. The median is perhaps a more representative measure in a distribution of this type and analysis shows that the median net ranch income was about \$730.

The total net income produced by all the ranches of any county ranged from \$43,086 to \$806,985, the amounts produced by the ranches of Wibaux and Beaverhead counties, respectively. These counties also showed the largest and smallest arithmetic average net income per ranch of any county with Beaverhead ranches averaging \$2242 net annual income and Wibaux County ranches only \$663 per ranch. These data are shown in the appendix (table C) for each of the 46 counties included in this study.

Table VIII shows the amount and percentage of net income from each of five different sources. This table indicates that 95 per cent of the total net income was from range livestock enterprises and that the income from cattle comprised over three-fifths of the total net ranch income.

Distribution of Net Income by Size of Ranch.—Analysis of the net income data indicates that a large proportion of the total net income

TABLE VIII. NET INCOME BY SOURCES
9130 MONTANA LIVESTOCK RANCHES

Sources	Amount	Per Cent
All sources	\$10,355,516	100
Range livestock	9,838,092	95
Cattle	6,374,045	61.5
Sheep	3,301,747	31.9
Horses	162,300	1.6
Other livestock	80,059	0.8
Crops	437,365	4.2

was acquired by a small proportion of the larger units. Table IX shows these data in the form of a cumulative percentage distribution of all ranches, and of aggregate net income by twelve size groups of ranches. Using the class 301-500 A.U. for purposes of comparison, this table indicates that the largest 13.7 per cent of all ranches (over 300 A.U. per ranch) received 45.9 per cent of the total net income. And conversely, the smallest 29 per cent of all ranches received only about 8 per cent of the total net income produced by all ranches.

Levels of Living, Defined and Characterized.--Level of living is defined by Wyand as being the sum total of values (consumption commodities) possessed and used by the family or person during the year. ^{15/} He characterizes it as including all food, shelter, clothing, recreation, and personal service and any other goods or services used to satisfy a personal desire. ^{16/} The impossibility of accurately measuring level of living is suggested by this definition. The grades and quantities of goods consumed, would have to be determined and a value assigned to them--all of which are relative in nature. Few if any efforts are made to measure it in its fullness of meaning. The most common device used in studies of farm levels of living includes deriving the net farm income and adding to that the value of the products produced on the farm.

^{15/} Wyand, Charles S., "The Economics of Consumption", the Macmillan Company, New York, 1937, p. 455.

^{16/} Ibid, Wyand, C. S., pp. 455-8.

TABLE IX. CUMULATIVE PERCENTAGE DISTRIBUTION OF RANCHES AND
AGGREGATE NET INCOME BY 12 SIZE GROUPS OF RANCHES

Size Classes of Ranches (in A.U.)	Ranches (9130)	Net Income (\$10,355,516)
25-50	100	100
51-100	70.6	92.4
101-150	41.9	77.0
151-200	28.6	65.1
201-300	21.8	58.0
301-500	13.7	45.9
501-750	6.9	31.2
751-1000	3.8	21.8
1001-1500	2.5	17.4
1501-2000	1.3	11.9
2001-3000	.8	8.9
Over 3000	.4	5.8

and used by the farm family, plus the rental value of the house.^{17/}

Income Requirements of Different Levels of Living.—Efforts to determine accurately an "acceptable" ranch income were made by Schwann in his study of Madison and Beaverhead counties. ^{18/} In this study the income is considered separately and apart from the expense items which are ordinarily charged against the operation of the ranch and include only those items chargeable to the personal needs of the family and an "acceptable" income derived on that basis.

Schwann says, "Discussion with members of the Montana Agricultural Experiment Station, Production Credit Association officers, Forest officers, bankers, merchants, and ranchers have brought out answers to the effect that the lowest average desirable income lies somewhere between \$500 and \$2000 per year. Several have narrowed this down to the statement that \$500 was formerly considered sufficient, but the majority agree that a minimum between \$700 and \$1000 is needed. A number of ranchers in various parts of Montana have, at one time or another, stated that a rancher should have a minimum personal return of \$1500 to \$2000." ^{19/}

After having discussed this problem of what is a suitable subsistence income, with numerous agencies and individuals and after analyz-

^{17/} Olsen, Bertha, Thesis, "Farm Family Living", June, 1937. See also Richardson, Jessie E., "The Quality of Living in Montana Farm Homes", Mont. Agr. Exp. Sta. Bul. 260.

^{18/} Schwann, H. E., op. cit.

^{19/} Ibid. Appendix, pp. 2-7.

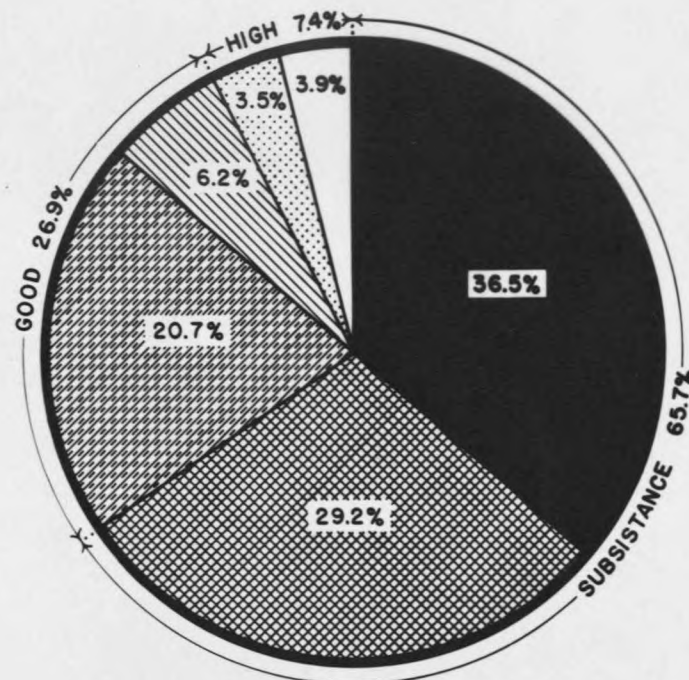
ing budgets, records of farm expenditures, and "standard" requirements, Schwann concludes that "the general average, so-called subsistence income is somewhere between \$600 to \$2000. Possibly a guess might be made that \$1000 to \$1200 would represent a general average. 20/ Actually there are so many variables that each family and each ranch represents a separate problem depending on tastes and desires, background, location, number and ages of children. The observation may also be hazarded, that it also depends on the opportunities of the ranch, indebtedness, etc." 21/

In order to develop the "approximate" level of living of the ranches and to furnish comparisons between groups and areas, the net income, "derived" as above, is used as a measure; and the "standard requirements" listed above as a basis for comparison of level of living.

Levels of Living of Montana Livestock Ranches.—Figure 9, showing the percentage distribution of all ranches, and of sheep, cattle, and combination ranches by six net income classes, implies rather drastic conclusions when interpreted in terms of the income requirements necessary to support various levels of living as established in the foregoing discussion. Examination of this figure will indicate, in

20/ The Home Economics Department, Montana State College in considering minimum ranch income requirements also developed three budgets of "acceptable minimum standards of living under Montana ranching conditions. According to these standards it required (1) \$550 net income to provide a "bare" subsistence level of living; (2) \$710 to provide a level of living which was "minimum for health and efficiency", and (3) \$1200 net income to provide a "minimum comfort" level of living.

21/ Schwann, H. E., op. cit., p. 7.



ALL RANCHES

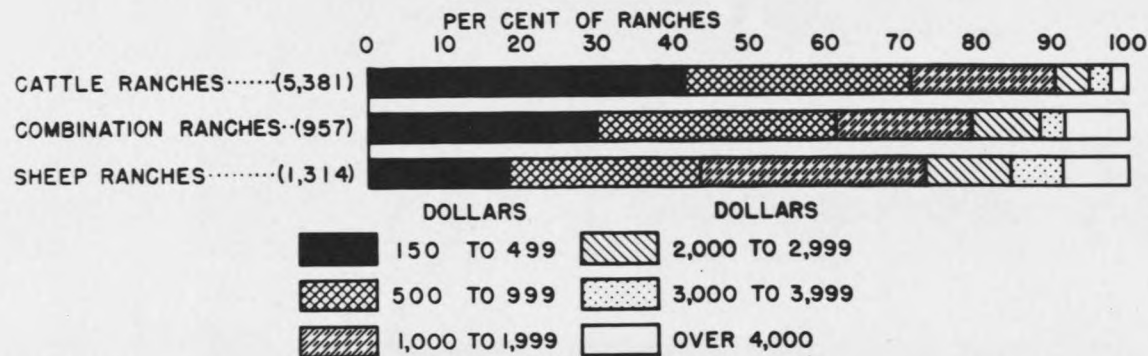


Figure 9.--Percentage of ranches receiving different amounts of net income from ranch enterprises.*

*Based on a study of the net income of 7652 livestock ranches in 46 Montana counties.

terms of level of living, that a very large proportion of all ranches are truly submarginal with respect to level of self-maintenance. According to these data, 36.5 per cent of all ranches produced less than \$500 net annual income and 65.7 per cent less than \$1000. Only 26.9 per cent had an income sufficient to support what might be classed as a good level of living (\$1000-\$3000), and only 7.4 per cent a high level (over \$3000 net annual income).

Comparison of these data with standards set up by the Department of Home Economics, Montana State College, indicates that about one-third of all stock ranches are normally on a "bare subsistence" level of living, producing an income from ranch enterprises which is insufficient to provide for any needs other than such fundamental requirements of food, shelter, and clothing as are necessary for existence. Also, comparison of these data with income requirements as listed in the previous discussion, indicates that only about one-third of all ranches are on an income level which would normally support a "minimum comfort" level of living. Further, by these data, only 15.6 per cent of all ranches produce what might be called a "desirable" net income of \$2000 or more.

Figure 10 shows the per cent of ranches in 4 net income classes for each of the 35 counties included in the study of net income distribution. Examination of this figure will indicate the general county relationships with respect to percentage of units in different income classes. It is noteworthy that the percentage of units which by these data received a net annual income greater than \$1000 was exceedingly

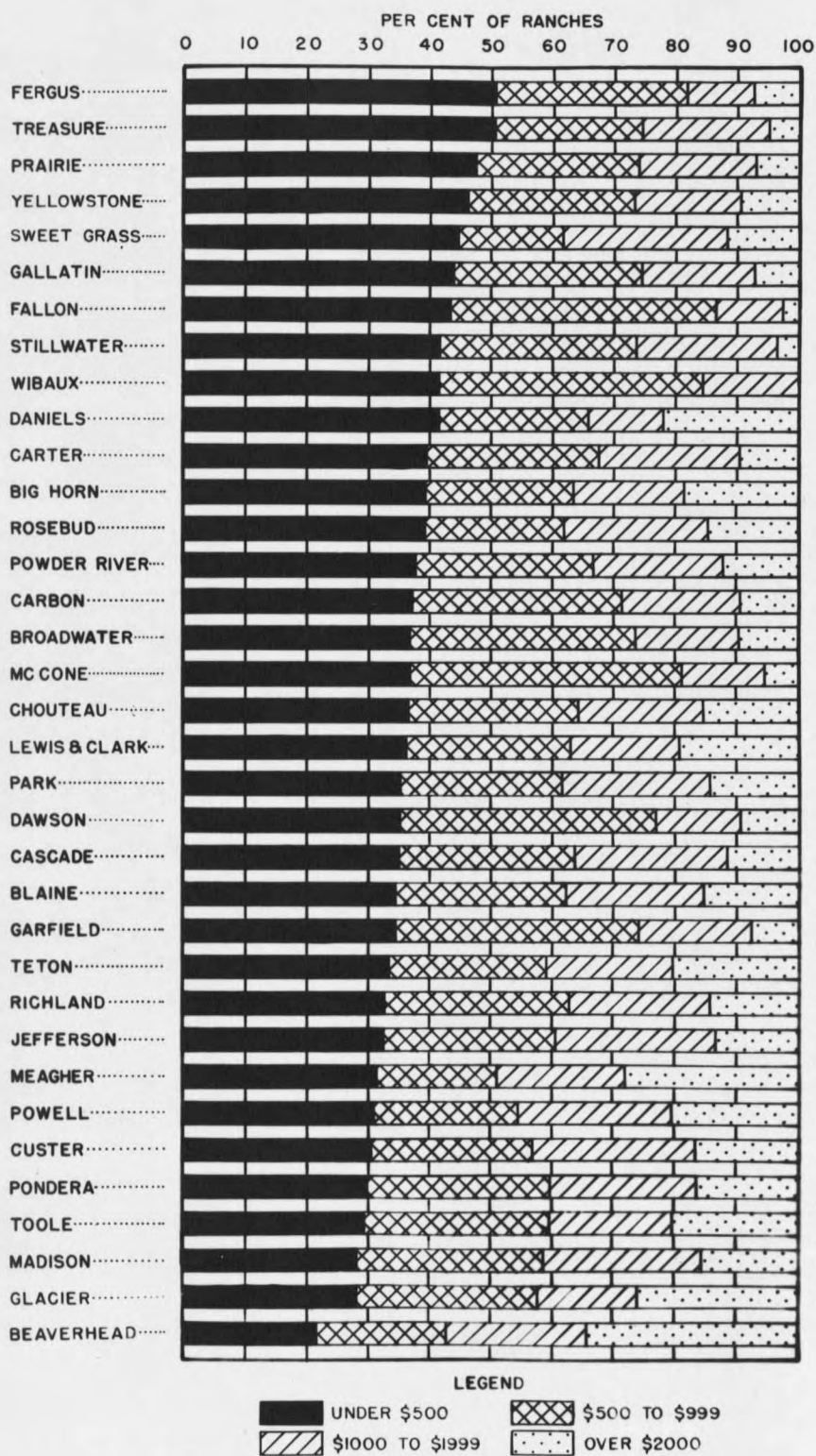


Figure 10.--Per cent distribution of ranches by 4 net income classes--35 Montana counties.

small for most counties. In Fergus County only 18 per cent of the units received over \$1000 net annual income from ranch enterprises. The other extreme was Beaverhead County in which 57.2 per cent of the units received over \$1000 net annual income.

PART V. SIZE CHARACTERISTICS OF MONTANA LIVESTOCK RANCHES

Trend in Size

The trend in ranch size is well illustrated in a small area for which quantitative data were available. "A study of the pioneer ranches operating in the 1890's in the Musselshell Valley showed about 55 established ranches in the area. There are now four counties in the same area, in which the last census reported approximately 400 stock ranches and 1200 other farms, with probably no greater number of livestock than at the earlier date." 22/

These data illustrate the trend and extent of change in ranch size that has been characteristic of most of Montana's range areas. As pointed out in the foregoing discussion of levels of living, this decrease in ranch size has proceeded so far as to result in an extremely large proportion of the ranches in the different areas being too small to provide an adequate income to support a desirable level of living.

Purpose and Procedure

This section of the study is an analysis of the extent and

22/ Saunderson, M. H., op. cit, 311, p. 4.

variation in ranch size as shown by an estimated 90 per cent of the ranches in the 46 counties analyzed. It shall seek to develop the size distribution of ranches and of livestock (livestock in terms of the size of ranch on which they are found) as a basis for evaluating different sizes of ranches within any area. The text shall consider the distribution of all ranches and all livestock included in this study pointing out salient differences between different kinds of ranches and some of the more outstanding area differences. County data are shown in the appendix.

Specifically this section shall seek to answer the following questions:

(1) What is the characteristic relationship between number of outfits and size of outfit?

(2) What is the relationship in size between cattle, sheep, and combination ranches?

(3) What is the relationship between number of livestock and ranch size?

(4) From these data, how does the size distribution of ranches and livestock compare? That is, what percentage of the operators control a certain percentage of all the livestock of an area?

(5) What is the size of ranch common to each of the 46 counties included in this study and how do the different counties compare in this respect?

In analyzing size, the ranches were first considered in one group to determine composite ranch characteristics and then broken down

into three general groups, into what is here termed small, medium, and large ranches, for the purpose of objectively differentiating between desirable and undesirable sizes and their relationship to different producing areas. All ranches were classified as to size in terms of total animal units of range livestock comprising the ranch unit.

In making the analysis of composite group characteristics, the ranches were segregated as to kind of ranch, since each kind displays definitely different characteristics, and were tabulated insofar as it was feasible, at small, uniform class intervals of size to determine the relationship between number of ranches, and size of ranch; that is, the number of the different kinds of ranches in progressively larger size classes. The analysis was carried out on a county, type of farming area, and state (46 counties) basis and will be presented in either way, depending upon the data to be illustrated.

Number of Ranches and Size of Outfit

Figure 11 shows the number of ranches by uniform class intervals of size up to 500 animal units per ranch, and figure 12 shows the distribution for ranches over 500 A.U. per ranch. These figures depict the relationship of number of ranches to size of ranch for all ranches and for each kind of ranch. Certain general tendencies predominate for all ranches, and certain differences between the different kinds of ranches become apparent upon examination of these figures.

The predominating tendency regarding the relationship of number

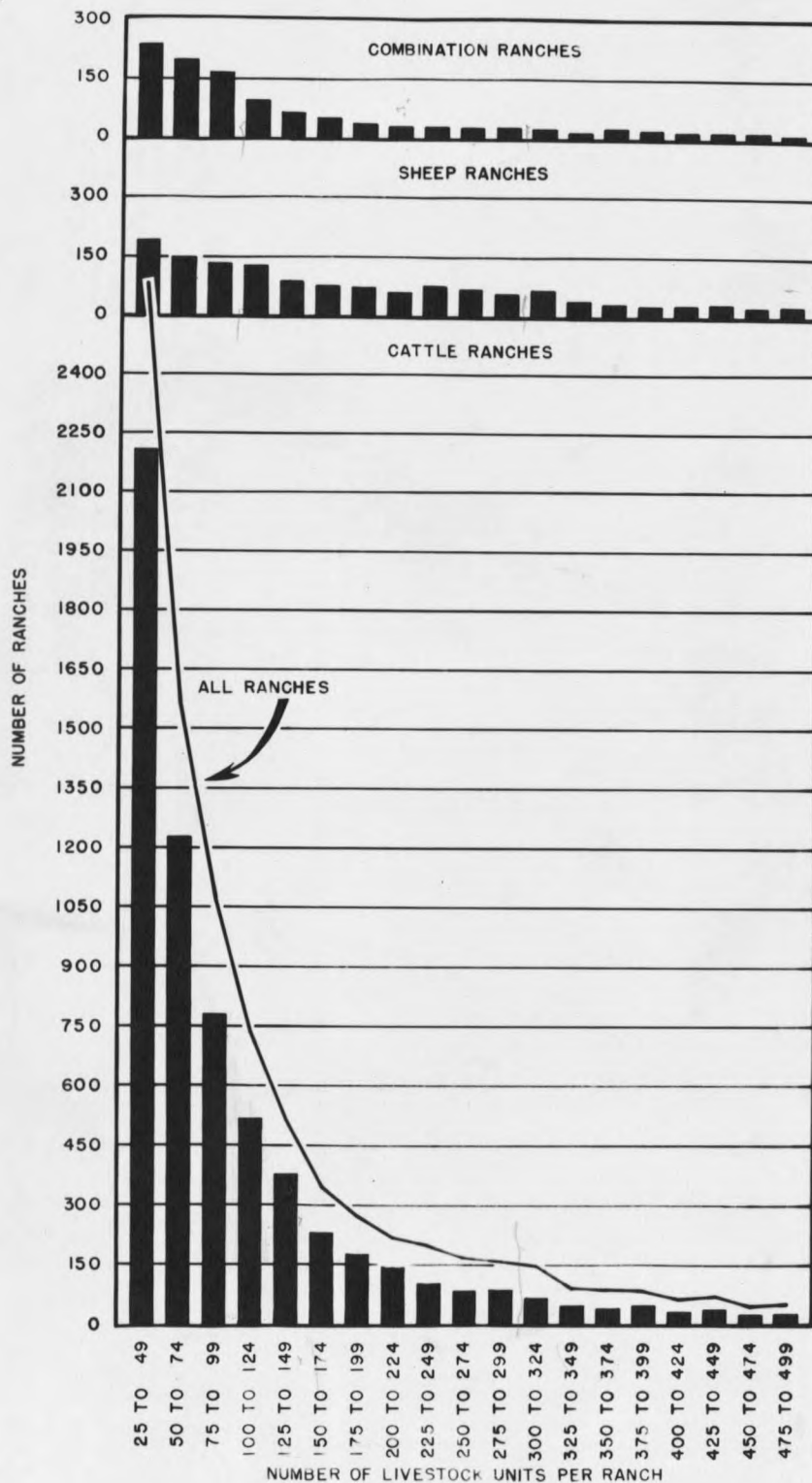


Figure 11.--Number of livestock ranches by size classes
(25-500 A.U. per ranch)--
46 Montana counties.

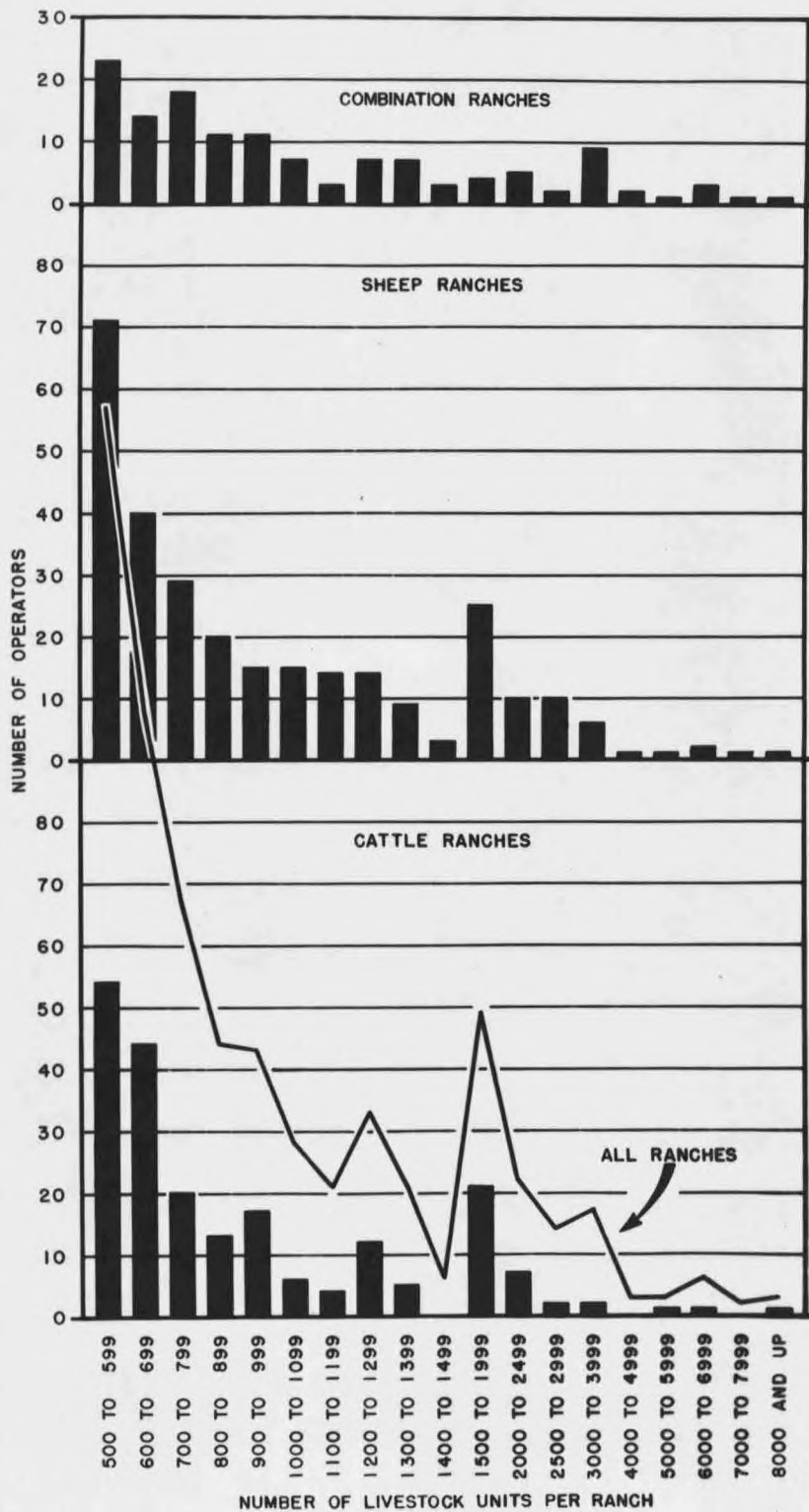


Figure 12.--Number of livestock ranches by size classes (over 500 A.U. in size)--
46 Montana counties.

of ranches to ranch size, is for the number to decrease as the size increases. Each consecutively larger size class of uniform class interval in these two figures shows a smaller number of ranches than the one preceding, with very few and minor exceptions. However, the decrease in the number of units in consecutive size classes among the smaller groups (up to 150 A.U.) is much more rapid than among the larger classes of ranches. The smallest size class (25-49 A.U.) alone accounts for 28.8 per cent of the entire number of ranches included in this study.

There are three apparent breaks in the tendency for a constant, uniformly smaller number of units in consecutively larger size classes. The first of these breaks occurs between the size classes 300 to 324 A.U. and 325 to 349 A.U. At this point there is a rather sharp decrease in the number of units in the former compared with the latter named class. The former class (300-324 A.U.) indicated a total of 149 ranch units between the upper and lower limits of that size group, the latter only 89, a decrease of almost 60 per cent. The second break in this uniform tendency is at the class 900 to 999 A.U. where the curve levels out precipitously and includes almost an equal number of units in that class (900-999 A.U.), as the class preceding, 44 ranch units as compared with 43. The only other break is in the class 1200 to 1299 A.U. where the number fluctuates from 21 ranches in the class preceding to 33 in the 1200 class and back to 21 ranch units in the class following. However, at these larger sizes the number of units is relatively small, and comprise a very small proportion of all units.

The predominant differences in the distribution characteristics between the different kinds of ranches as indicated by these figures (11 and 12), is for the number of cattle ranches to decrease much more precipitously in consecutively larger size classes than sheep or combination units, especially among the smaller size groups. Sheep ranches show a general decreasing tendency as regards the number of units in consecutively larger classes, and combination ranches a sharper initial decline, leveling out at about 150 A.U. to include an almost equal number in each consecutive size class.

These charts (figures 11 and 12) indicate that there is very little tendency for certain sized units to predominate over other sizes other than the uniform tendency for a larger number of smaller units. Especially is this true of cattle and combination ranches which by this chart exhibit no apparent grouping tendencies. However sheep ranches do exhibit some tendency toward grouping into the size groups between 225 and 325 A.U. per ranch. These different groupings occur at sizes which correspond roughly to a one band sheep outfit in different sections of the state. In the western part of the state the one band outfit consists of about 1000 to 1200 (200-240 A.U.) head of sheep; in the eastern sections from 1400 to 1600 head (280-320 A.U.) 23/

The extent and variation in the size grouping of sheep ranches for different sections of the state is shown in table X. The circled

23/ Saunderson, M. H., "The Economics of Range Sheep Production in Montana", Montana Agricultural Experiment Station Bul. 302, June, 1935, p. 15.

TABLE X. EXTENT OF GROUPING OF SHEEP RANCHES
INTO DEFINITE SIZE CLASSES

Per Cent of Sheep Ranches by 20 Size Classes
4 Montana Types of Farming Areas

Size Classes of Ranches in A.U. per Ranch	Type of Farming Areas			
	8 (264)	5 (179)	1 (354)	2 (216)
25-49	9.1	11.2	14.8	13.4
50-74	6.8	8.9	11.5	8.8
75-99	4.5	8.9	12.0	5.0
100-124	7.6	11.7	8.1	6.0
125-149	5.7	5.6	4.7	5.6
150-174	3.8	4.5	3.6	5.0
175-199	2.7	3.4	4.7	7.9
200-224	3.0	3.9	3.9	2.8
225-249	5.3	4.5	4.7	5.6
250-274	4.2	2.8	3.4	4.2
275-299	4.5	1.6	3.4	4.2
300-324	3.4	8.4	3.6	2.8
325-349	2.7	1.1	1.4	4.2
350-374	2.3	2.2	2.5	1.9
375-399	0.4	---	1.7	1.9
400-424	2.3	1.1	2.0	1.9
425-449	3.0	0.6	2.0	1.9
450-474	1.5	1.1	1.4	1.4
475-499	1.1	1.1	2.0	0.5
Over 500	25.7	17.4	8.7	15.0

numbers represent concentrations or groupings and correspond somewhat to a farm flock, half band, full band, and a two-band outfit in different sections of the state.

Type of farming area number 8 indicates 4 slight groupings of sheep ranches at what would correspond to a farm flock (25-50 A.U.); a half band (100-150 A.U.); a full band (225-300 A.U.); and another grouping at what would normally constitute a two-band outfit (400-450 A.U.) of 2000 to 2250 head in the western part of the state. Area number 5 shows the most clear-cut groupings of any area, a factor possibly influenced by a smaller and more uniform area than most of the others (Blaine, Valley, and Phillips counties), and by a relatively small number of units. The most pronounced grouping for this area was at 300 to 324 A.U. (1500 to 1620 head), a typical one-band outfit for that section of the state. Both areas 1 and 2 show very little tendency toward grouping. In some sections the permit policies of the Forest Service have been a directing factor in size developments.

These data would seem to indicate that variation among the individual units is almost too great and also the possible economies of operation within quite wide numbers so great as to have relatively little effect upon the predominant size of unit for any area. The deciding factors would possibly be the operator and ranch unit, (the acreage of grazing land, of feed base, etc.) both of which vary widely within the same area.

Size Relationship of Cattle, Sheep, and Combination Ranches

Size Class Composition.--Figure 13 shows the percentage composition of each of 33 size groups of ranches by kind of ranch. Examination of this figure will indicate definitely different characteristics and tendencies in this respect. This figure indicates that in the smallest size group (25-49 A.U. per ranch), cattle ranches comprise about 84 per cent of all ranches compared with 9 per cent for combination ranches and about 7 per cent for sheep units. The percentage of cattle ranches to the total number in each consecutive size class decreases fairly uniformly until they comprise only about 11 per cent of all ranches between 3000 and 3999 A.U., the last size class sufficiently large to be indicative of any definite relationships among the different kinds of ranches. Combination ranches comprised about 15 per cent of all ranches in each size group up to this 3000 A.U. class where the percentage increased, possibly indicating the tendency for extremely large units to operate on a combination sheep and cattle base. Most of the decreasing percentage of cattle units in each successive size class was replaced by a larger percentage of sheep ranches, increasing from about 7 per cent in the smallest size group to about 70 per cent of all ranch units between 2500 and 2900 A.U.

Cumulative Percentage Size Distribution of Ranches by Kind of Ranch.--Figure 14 shows the cumulative percentage size distribution of all ranches by kind of ranch up to 500 animal units per ranch and shows the percentage of the different kinds of ranches above or below any size class. Examination of this figure will indicate that 50 per cent of all

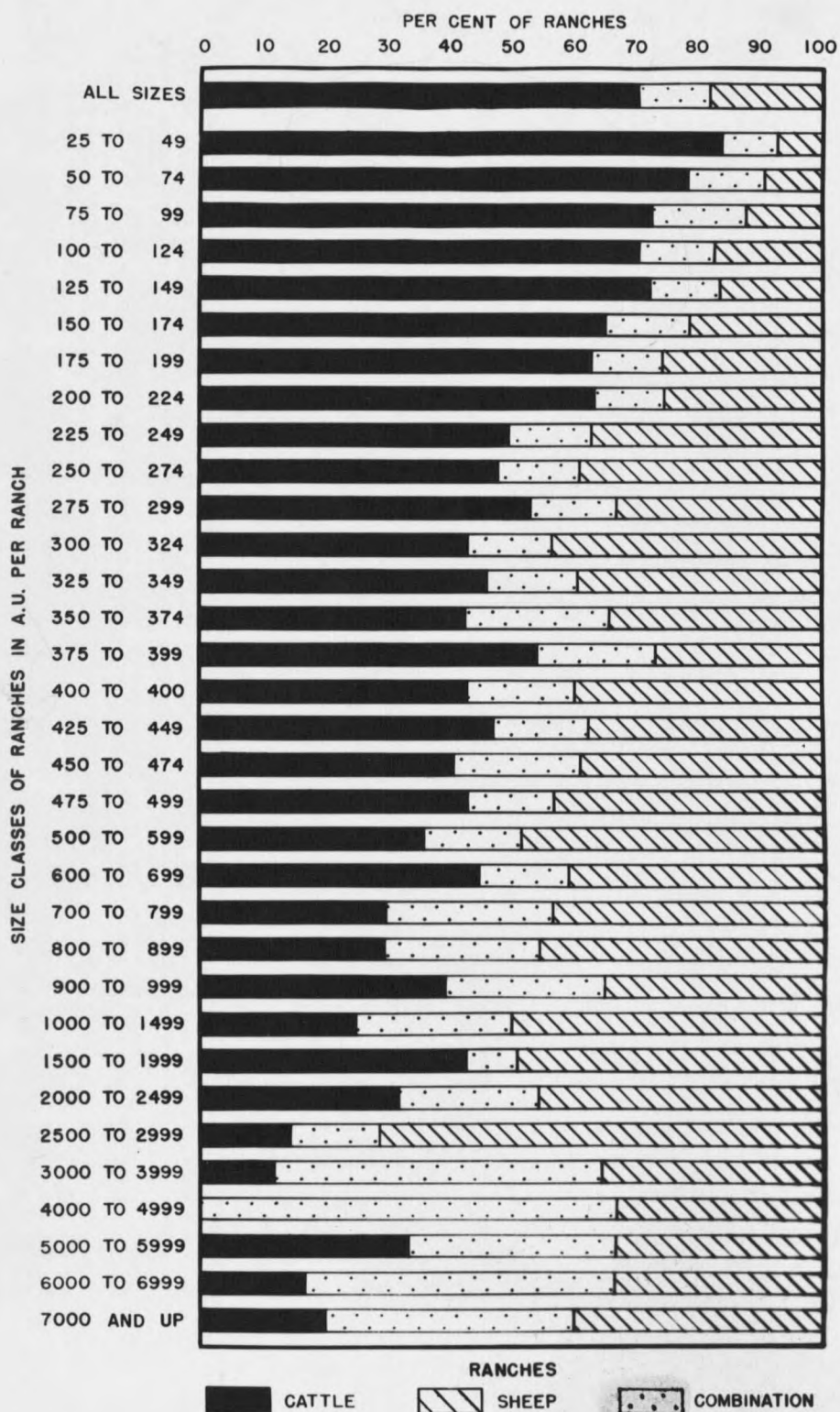


Figure 13.--Percentage by kind of ranch in 33 size groups of ranches--
46 Montana counties.

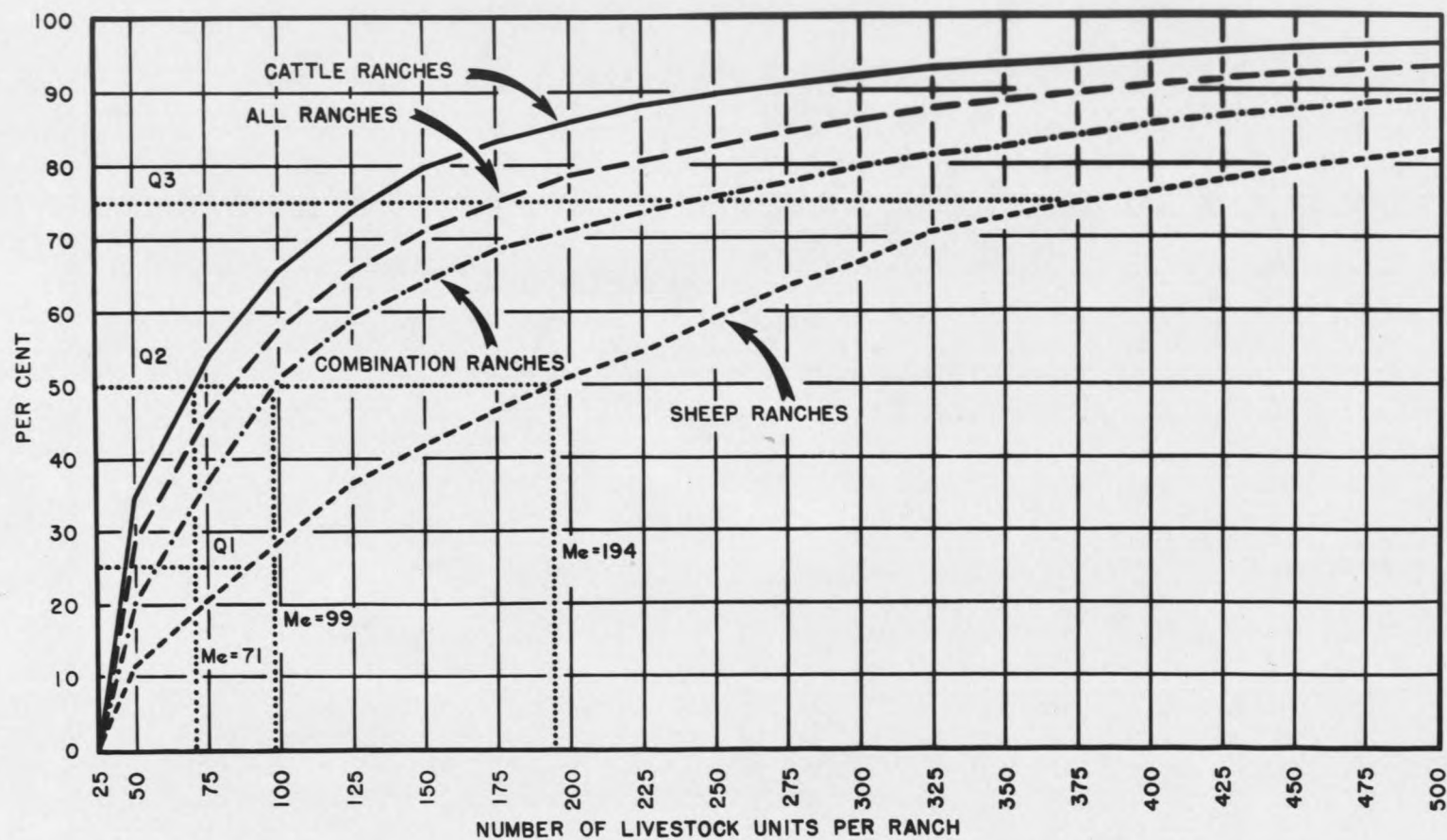


Figure 14.--Cumulative percentage size distribution by kind of ranch (25-500 A.U.)--9130 Montana livestock ranches.

cattle ranches included in this study were below, and 50 per cent above a median size of 71 animal units per cattle ranch, compared with 99 animal units for combination ranches, and 194 animal units for sheep ranches.

Interpolation at the third quartile indicates even greater differences. It indicates that one-fourth of all ranches had more than 170 animal units per ranch, compared with 125 animal units for cattle ranches, 250 animal units for combination ranch units, and 375 animal units for sheep outfits. This indicates the tendency for sheep ranches to be fairly large in size, and for combination ranches to be almost midway between sheep and cattle ranches with respect to size. It again indicates a very large proportion of cattle ranches among the smaller size classes.

Number of Livestock and Ranch Size

Size Class Composition by Kind of Livestock.—The aggregate number of livestock controlled by the various sized ranches is an important consideration for any ranching area. It furnishes a basis for evaluating the different sizes of ranches, thereby providing a means for extension workers to formulate and direct programs and a basis for agencies in charge of public grazing resources to develop plans of procedure in permit distribution.

Figure 15 shows the variation among the different kinds of range livestock with respect to the number of each class found on different sized ranch units in the form of a percentage composition by size classes. It will be noted that the percentage of cattle to total numbers was about 86 per cent in the class 25-50 animal units and that it gradually

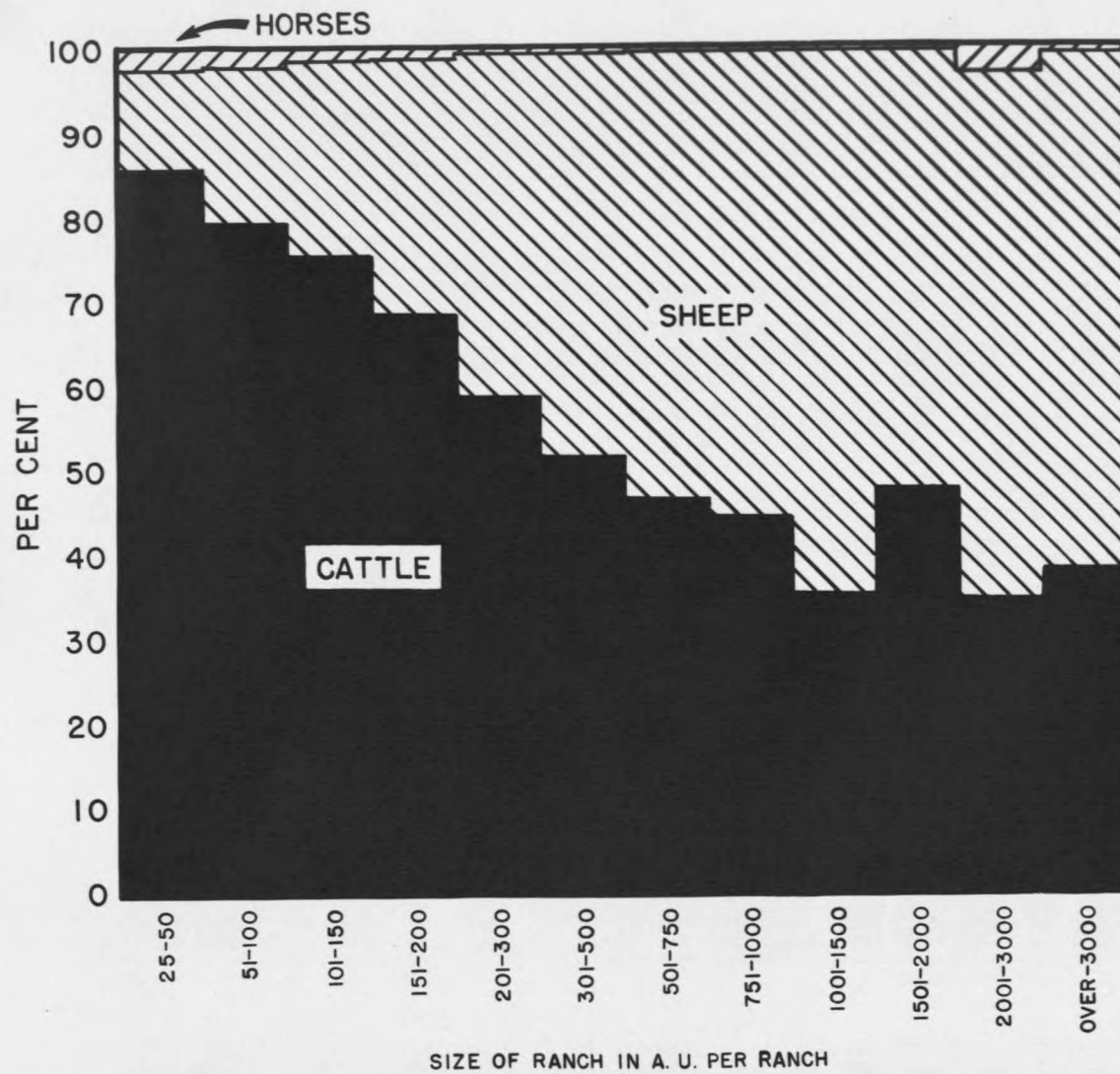


Figure 15.--Percentage by class of range livestock in 12 size groups of ranches.

decreases to about 35 per cent in the size class 2000-5000 animal units. The percentage of sheep to the total number of livestock increases from about 12 per cent in the class 25-50 animal units to over 60 per cent in the classes over 2000 animal units. The percentage of horses to total numbers of livestock comprises less than 2.2 per cent in every size class but is the largest in the smallest size classes.

Cumulative Percentage Distribution of Range Livestock by Ranch Size.--Table XI shows the cumulative percentage distribution of each class of range livestock by 12 size groups. Reference to this table will give for each class of livestock the percentage of the total number included in this study that was on ranches below any size group. For example, using the size class 200 to 300 animal units for illustration, this table indicates in round numbers that 43 per cent of all livestock were on ranches of less than 300 animal units in size, that 55 per cent of all cattle, 26 per cent of all sheep, and 59 per cent of all horses were on units smaller than the upper limits of this class (300 animal units). This same table indicates that 10 per cent of all range livestock on the livestock ranches included in this study were on units of more than 3000 animal units in size, compared with 6.9 per cent of all cattle, 14.4 per cent of all sheep, and 6.2 per cent of all horses. These analyses indicate the extremely large proportion of total livestock numbers controlled by a few very large ranching units and the tendency for sheep to pre-dominate on the larger outfits.

TABLE XI. CUMULATIVE PERCENTAGE DISTRIBUTION OF RANGE LIVESTOCK
BY 12 SIZE CLASSES OF RANCHES
46 MONTANA COUNTIES

Size Classes of Ranches (in A.U.)	All Classes (1,712,260)*	Cattle (959,369)*	Sheep (736,661)*	Horses (16,320)*
25-50	5.7	8.7	1.6	12.9
51-100	16.8	24.4	6.4	35.0
101-150	25.5	36.2	11.1	46.1
151-200	31.8	45.9	15.5	53.5
201-300	42.5	55.1	25.5	59.2
301-500	56.5	68.0	41.0	66.4
501-750	66.5	76.4	53.3	70.4
751-1000	72.3	81.0	60.9	72.7
1001-1500	80.1	85.0	72.5	75.7
1501-2000	84.9	90.0	78.3	78.0
2000-3000	90.0	93.1	85.6	93.8
Over 3000	100	100	100	100

* Animal Units.

Comparison, Number of Livestock and Number of Ranches
By Size Classes

Number of Operators and Livestock by Size Classes.—Figure 16 shows the total number of livestock and total number of ranches by uniform class intervals of size up to 500 animal units per ranch on a ratio scale of one operator per 100 animal units of livestock. This shows the distribution of ranches and of livestock and the extreme differences in the two. It indicates that the total number of ranches in each succeeding size class greatly decreases, whereas the aggregate numbers of livestock decrease relatively slowly. The approach to or divergence from a tendency of 100 animal units per ranch is also indicated by the approach to or spread in the length of the adjacent columns. This distribution includes 93.1 per cent of all ranches and 57.1 per cent of the total number of livestock included in this study. Since the number of livestock in consecutively larger size classes is a constant function of the number of operators and the size classes, logically there would be no more tendency toward "grouping" of livestock at certain sizes than of operators. However, the spread between number of operators and aggregate number of livestock becomes continually wider as the size classes increase because the classification was made on the basis of livestock numbers.

Size Distribution of All Ranches and All Livestock.—Figure 17 shows the cumulative percentage distribution of all ranches and all livestock by size classes. Reference to this figure will indicate the percentage of either ranches or livestock above or below any size of ranch, and comparison of the two distributions will indicate the percentage of

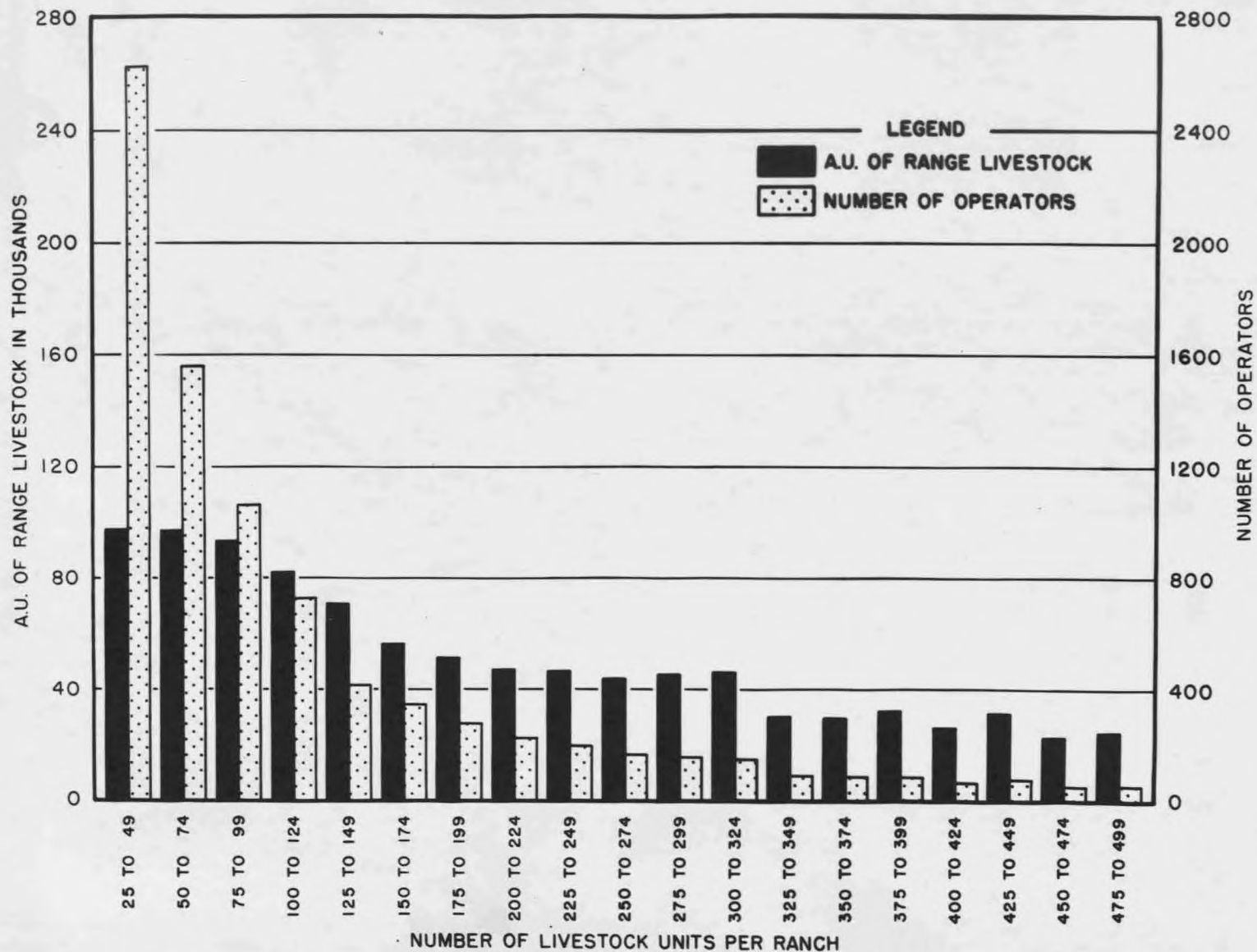


Figure 16.--Number of operators and range livestock by size groups of ranches (25-500 A.U. per ranch)--46 Montana counties.

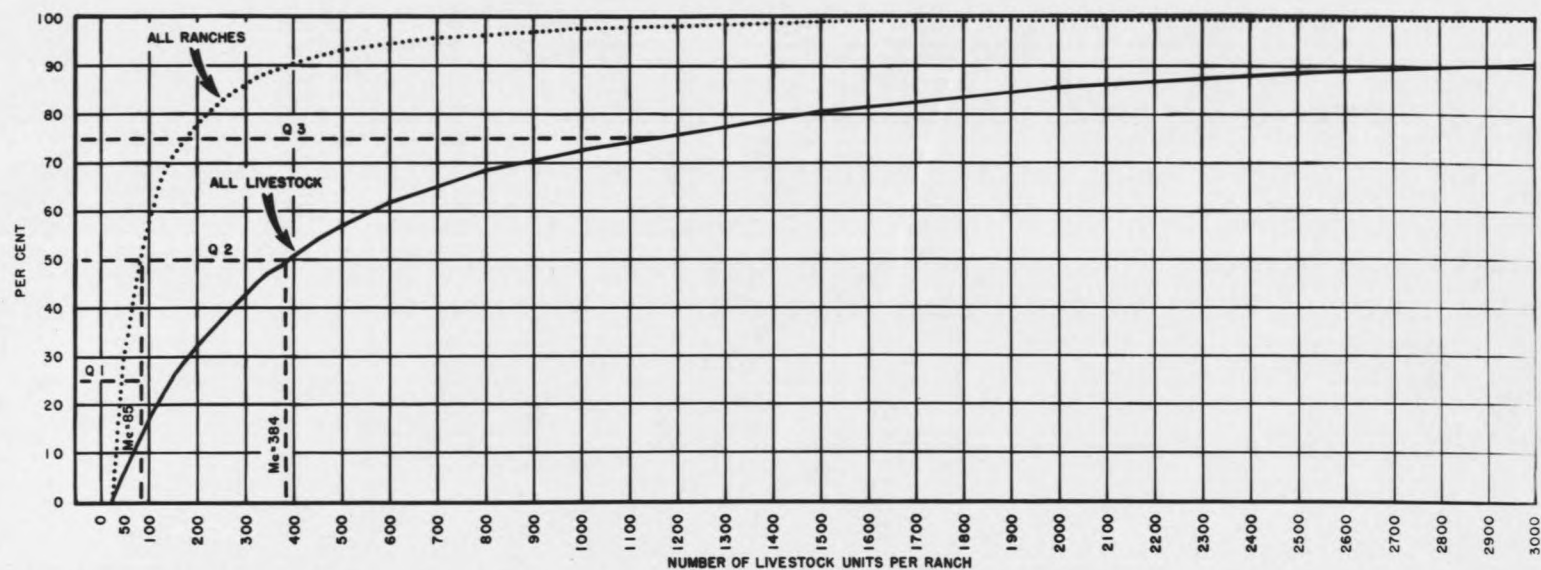


Figure 17.--Cumulative percentage size distribution of 9130 Montana livestock ranches and 1,712,260 A.U. of range livestock.

livestock controlled by any percentage of ranches. That is, reference to this figure will indicate that 50 per cent of all ranches were below and 50 per cent above a median ranch size of 84 animal units per ranch; whereas, 50 per cent of all livestock were on ranches above the 50 per cent below a median ranch size of 384 animal units per ranch. Further comparison of the two distributions indicate that the smallest three-fourths of all ranches controls only about one-fourth of the entire number of livestock, and that the 10 per cent of all ranches that are largest in size control about 50 per cent of all livestock. It is noteworthy, that about 9 per cent of all livestock in the 46 counties included in this study were on ranches of over 3000 animal units per ranch.

Size Distribution of all Ranches and all Livestock--County Extremes.—Table XII shows the distribution of the ranches and livestock of two counties with the largest percentage of ranches over 100 A.U. in size, and the two counties with the smallest percentage of operators on ranches of over 100 A.U. in size. This table shows the size distribution of operators and livestock for Beaverhead and Meagher counties and for Fergus and Gallatin counties on this basis. Using the class 500 to 750 A.U. for purposes of comparison, this table indicates that in Beaverhead county 21.6 per cent of all ranches were over 500 A.U. in size and they controlled 73.2 per cent of the entire number of the stock on livestock ranches within that area. In Fergus County, however, only 2.9 per cent of the ranches were over 500 A.U. in size and they controlled 21.7 per cent of all the livestock in that county. Interpolation and comparison is possible at any other point on this table.

TABLE XII. CUMULATIVE PERCENTAGE DISTRIBUTION OF OPERATORS
AND LIVESTOCK BY 12 SIZE CLASSES OF RANCHES
4 MONTANA COUNTIES*

Size of Ranch in A.U. per Ranch	Beaverhead		Meagher		Gallatin		Fergus	
	Operators (360)	Livestock (166,089) A.U.	Operators (143)	Livestock (56,734) A.U.	Operators (241)	Livestock (32,095) A.U.	Operators (211)	Livestock (22,016) A.U.
25-50	100	100	100	100	100	100	100	100
51-100	84.7	98.8	76.2	97.7	63.5	90.1	58.3	85.8
101-150	63.5	95.3	55.9	94.1	27.4	70.4	26.1	63.7
151-200	51.4	92.0	44.7	90.6	17.4	61.1	15.7	51.1
201-300	44.7	89.4	38.4	87.9	14.5	57.3	11.0	43.3
301-500	34.4	83.8	31.4	83.4	5.8	41.3	5.8	31.6
501-750	21.6	93.2	21.6	73.8	3.3	33.9	2.9	21.7
751-1000	15.2	64.8	15.3	64.4	2.5	30.1	—	—
1001-1500	11.9	58.6	11.2	55.8	2.1	27.6	1.0	11.3
1501-2000	6.9	45.9	—	—	1.2	19.9	—	—
2001-3000	3.9	34.9	4.2	32.9	.4	8.9	—	—
Over 3000	1.7	23.5	2.8	24.7	—	—	—	—

* Beaverhead and Meagher counties show the largest percentage of units over 100 A.U. per ranch of any counties, and Gallatin and Fergus the smallest percentage.

Similar data are shown in the appendix (table E) for each of the 46 counties included in this study. From this table it is possible to determine for each county the number and proportion of ranches and live-stock in each of these twelve size classes and through this means to evaluate the importance of the different sized ranching units to each county.

County Ranch Size

Purpose and Procedure.---Two approaches are used in presenting data concerning ranch size on a county basis. The first is showing chartographically the median size of ranch for the 46 counties included in this study as a means of indicating the general relationship in size of ranch between the different counties and areas of the state. The second is showing the percentage of the ranches in the different counties that are here classed as small, medium and large ranch units. These latter data provide a means for objectively illustrating the extent and variation among the counties of desirable or undesirable sized ranch units.

Median County Ranch Size.---Figure 18 gives a general characterization of size of ranch on a county basis and pictures general area relationships in this respect. It shows the median size of ranch for 46 Montana counties. The median represents the middle-most item of a distribution, and is given here as a convenient representation of ranch size in the various counties. The areas and counties of predominantly small ranches, and the areas and counties having a relatively large proportion of large units are depicted by this figure. The counties where small-scale diversified farming is predominant become obvious by this figure because of

[illegible]

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the small median size of ranch common to these counties or areas. Likewise, the truly range livestock areas are conspicuous because of the large median size of ranch. In 7 counties, the median size of ranch was below 70 A.U. per ranch. They were Roosevelt, Daniels, Sheridan, Fallon, Fergus, Treasure and Gallatin counties. In 5 counties the median size of ranch exceed 110 A.U. per ranch. They were Beaverhead, Madison, Powell, Meagher, and Glacier Counties.

Number of Small, Medium and Large Ranches by Counties.—The ranches of the 46 counties were classed as small, medium, or large on the basis of the number of animal units of range livestock comprising the individual ranch unit for the purpose of indicating roughly the extent to which the ranches of any county are of a desirable or undesirable size. The small units (25-100 A.U. per ranch) by this classification comprise a group of units which are generally too small to produce an income large enough to provide the ranch family with an adequate level of living under normal conditions. They are arbitrarily classed as "undesirable" even though there is definitely a place for them in the economy of any area since they are available sources of year-long labor on the larger units. However, the extremely large number of these units would seem to be greater than the requirements for these purposes.

The "medium-sized" units (those between 101 and 500 animal units) are what might roughly be called family-sized ranches of a socially and economically desirable size. This includes the lowest size that will ordinarily furnish the operator and family with full-time employment, as well as the upper limit in size that the operator and his family can

"normally" care for without too much year-long hired labor. The lower limit of this group is somewhere near that size necessary to support a "minimum comfort" level of living. 24/ The upper limit is an approximation to the upper limits of efficiency in production per unit of livestock and capital used. 25/ Even though the outfits with more than 500 to 600 animal units commonly operate more effectively than smaller units, the demand for range and efficiency of operation would conspire to set the "upper" limit of "desirable" size at 500 to 750 animal units. In this discussion, 500 animal units is considered as that point.

The ranches of more than 500 animal units include roughly a group of ranch organizations which, though relatively scarce, control a large proportion of all livestock and grazing resources, public as well as private. It is this group of units which is discriminated against from the public standpoint, because of uneconomic use of resources and failure to bring the greatest good to the community. 26/ Schwann in a study of desirable sizes from these two standpoints, indicates that units of 250 to 400 head of cattle, and 3,600 to 4,000 head of sheep are the most desirable sizes in Madison and Beaverhead counties. 27/ He concludes his discussion of desirable ranch sizes saying, "It is recommended that the maximum limit for this area be established at 500 head of cattle and 4000 sheep." 28/

24/ Saunderson, op. cit., Bul. 311, p. 18.

25/ Schwann, op. cit. Section III, p. 28.

26/ Schwann, op. cit. Section VI, p. 34.

27/ Ibid., p. 34.

28/ Ibid., p. 34.

Consequently, it is the ranch units above these sizes that are publicly less desirable than the smaller units.

An interesting comparison of these three groups of ranches is the extent to which the small uneconomic ranch units might be raised to an economic level of production if it were possible (and desirable) to do so by a redistribution of the livestock controlled by the so-called socially undesirable large units. For the state as a whole the outfits under 100 A.U. in size lack an aggregate of 244,052 A.U. of having a minimum of 100 A.U. per ranch. Also, the outfits greater in size than 500 A.U. per ranch show an excess of a 500 A.U. requirement per ranch of 430,063 A.U. Thus, if the large units were to be reduced to a maximum of 500 A.U. per ranch and these "excess" A.U. of livestock were to be divided among the smaller units in an effort to give them a minimum sized economic unit, there would be an excess of 186,011 A.U. over the requirements of the smaller units. Possibly there is still room for scaling the large units down in an effort to provide a larger number of ranch operators with an economic ranch unit.

Figure 19 illustrates county ranch size on the basis of the three general size groups discussed above. It shows the percentage of ranches in each of the 46 counties included in this study that are here designated as small, medium, or large-sized units. The counties are listed according to the percentage of ranch units designated as small ranches by this classification, with the counties in which the percentage of small units is greatest being listed at the top of the figure. Examination of this figure (number 19) will indicate that in five counties, over 70 per cent of all the ranches had fewer than 100 A.U. per ranch. Fergus county showed the

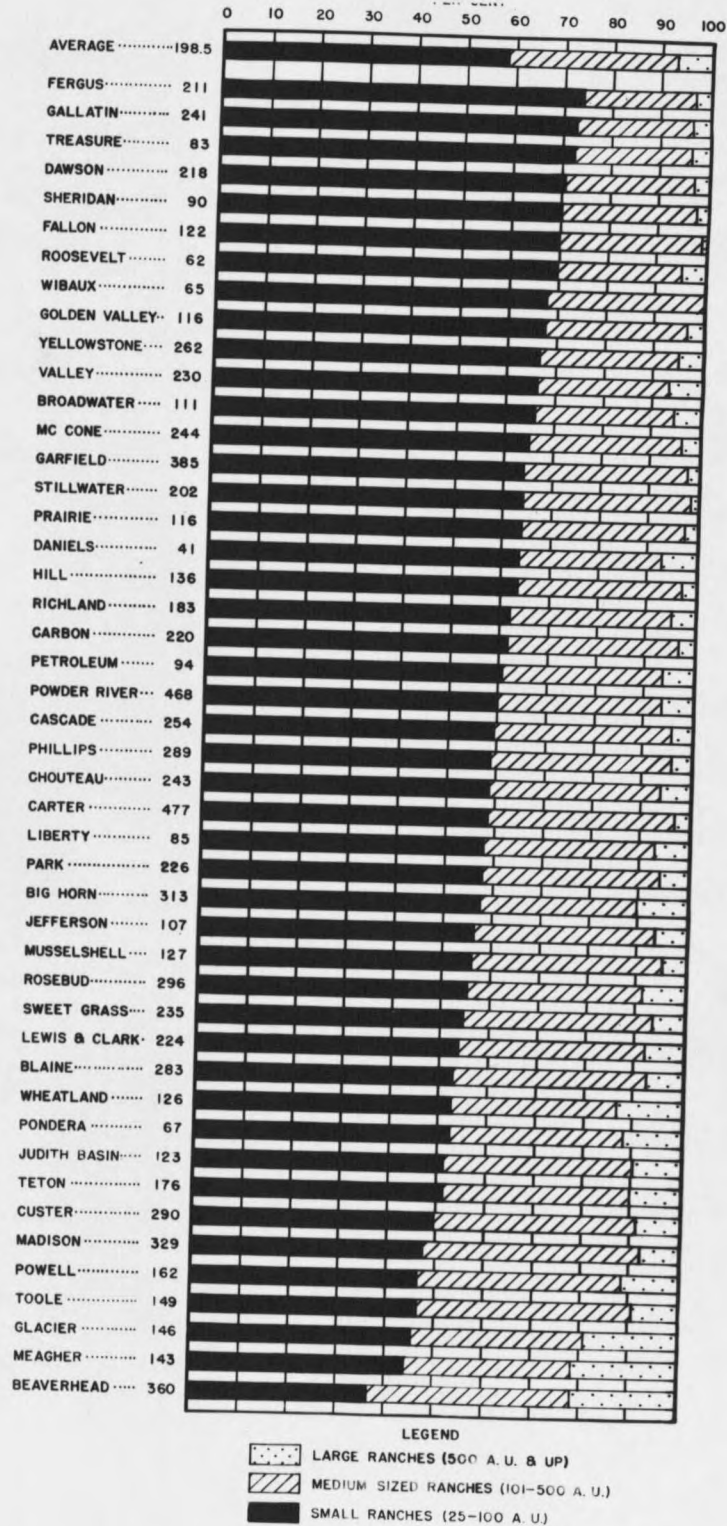


Figure 19.--Per cent of ranches in three size groups of ranches--
46 Montana counties.

largest percentage of ranch units of fewer than 100 A.U. per ranch of any county with 73.9 per cent of the entire number in that county below 100 A.U. per ranch. The other counties in which over 70 per cent of all ranch units were under 100 A.U. per ranch were Gallatin, Treasure, Dawson, and Sheridan counties.

Only seven counties showed less than 50 per cent of all units as being small ranches by this designation. Beaverhead county showed the smallest percentage of small units with 36.6 per cent of the units in that county under 100 A.U. per ranch. Meagher, Glacier, Toole, Powell, Madison, and Custer counties were the remaining six counties in which less than 50 per cent of the ranches were under 100 A.U. per ranch.

Madison and Toole counties showed the highest percentage of medium-sized ranch units (100-500 A.U. per ranch) of any of the 46 counties, with 44.7 per cent and 44.3 per cent of the ranches in these counties falling in this classification. This figure indicates that in most counties about one-third of all ranches are between 100 and 500 A.U. in size.

This figure shows quite wide variation in the percentage of large ranches (over 500 A.U. per ranch) among the individual counties. Wibaux County was the only one in which there was no outfit greater than 500 A.U. in size. The range in the percentage of ranches designated as large units by this classification was from 0.0 per cent for Wibaux county to 21.7 per cent for Meagher and Beaverhead counties. In half the counties included in this study, more than 5 per cent of the ranches were classed as large units by this designation and in the other half of the counties the large units comprised less than 5 per cent of the total.

PART VI. POSSIBLE USES AND APPLICATION OF THESE DATA

The purpose of this study was to determine the variation in the size, income, and some organization characteristics of the livestock ranches of Montana and to make this information available on a county basis for possible use by the different public agencies aiding the ranches of any area. In pointing out how some of these agencies may use these data in developing their programs or better defining their policies, the information regarding the ranches of each county that is included in this study is listed, followed by a brief discussion of the application of the data developed.

The county information listed or otherwise indicated either in the text or appendix of this study includes:

(1) The number of the different kinds of ranches. (This includes an estimated 90 per cent of all the ranches in the counties studied.)

(2) The number of the different kinds of range livestock on the ranches of the individual counties. (It is estimated that 69 per cent of all beef cattle and 86 per cent of all sheep are on livestock ranches in Montana. From these figures it is possible to determine the approximate total of cattle or sheep for any county.)

(3) The total amount of gross and net income produced by the ranches of the county by sources of income.

(4) The number and per cent of ranches receiving various amounts of gross and net income from ranch enterprises.

(5) The number of ranches and livestock in 12 different size

groups of ranches.

Some general characteristics of size, organization and income were also developed for all ranches.

There are three principal agencies that might find use for these data. They are: (1) different government programs and planning agencies; (2) the management of public grazing resources; and, (3) state and county extension workers.

The number of the different kinds of ranches and of range livestock in the different counties gives the management of public grazing resources and the county agents an estimate as to the relative importance of the different kinds of ranches or livestock within the area.

The total amount of gross and net income produced by the ranches of any county is a consideration of the county agents and various institutions engaged in business within the areas. The gross income represents the total amount of money produced and used by the ranchers to support all the different institutions and agencies within the area. The net income represents only that portion used for the purchase of consumption commodities.

The number and per cent of ranches in various gross and net income classes is of possible significance to government programs and planning agencies in isolating the areas where assistance is most needed and in estimating the amount of this needed aid. It is a means of giving the county agent a birds eye view of his county and suggests possible changes in the direction of his energies.

The number of ranches and of livestock in different size groups is a primary consideration of the management of the various public grazing resources, but is also an important consideration of the state and county extension workers. Through a knowledge of these data the various agencies in charge of public grazing resources may determine the relative demand for range among these different size groups of ranches and estimate the possible effects of a change in policy upon the ranches of the area. The aggregate number of livestock in the different size classes is a cue to the relative demand for range by the different size groups of ranches, and the number of ranches in each one of these groups is a means of estimating the effects a change in the permit distribution policy on public lands would have upon the ranchers of the area.

These data also furnish state and county extension workers with a summary of the relative importance of the different sized groups of units within the different counties and should assist him in devising programs that are directed toward performing the greatest service for the people of the county.

These data may be of value to these various public agencies in developing programs to better discharge their public obligations.

SUMMARY

This is a study of the size, income, and some features of organization of the livestock ranches of 46 Montana counties. The study includes 9130 ranches of an estimated 10,144, or about 90 per cent of the range livestock producing units in the counties studied as of the years 1932-35.

Considered as a group, the livestock ranches of Montana are smaller than the minimum requirements for an economic unit, and they produce an income inadequate to support a socially desirable level of living under Montana ranch conditions. Conservative estimates of the minimum-sized ranch unit which can produce effectively and provide a ranch family with an acceptable living income place the minimum requirement for an economic unit at about 100 animal units of range livestock per ranch. About 58 per cent of the ranches in the areas studied had fewer than 100 animal units of range livestock per ranch and about one-half of all ranches had fewer than 85 animal units per ranch. Twenty-nine per cent of all ranches had fewer than 50 animal units per ranch and about 7 per cent had over 500 animal units per ranch.

Investigators maintain that the "average" ranch family requires a net income of about \$1000 in order to maintain a socially desirable level of living under Montana ranch conditions. About two-thirds of all the ranches included in this study had a net annual income of less than \$1000. Half the ranches received less than \$750 annually. Eighteen per cent of the ranches included in this study received over \$3000 net annual

income.

Under the commercialized and specialized type of agriculture common to Montana livestock ranching, where production is largely limited to one or two major commodities, and where there is relatively little production for home consumption, a large gross income is essential to ranch prosperity. About 27 per cent of all ranches normally receive a gross income from ranch enterprises of less than \$1000 annually. Half the ranches in the areas studied received a gross annual income of less than \$1822. Among the higher income classes, there was also a fairly large percentage of ranches. Eighteen per cent of all ranches received over \$5000 gross annual income from ranch enterprises.

Following are some figures that furnish a better basis for interpreting the limits and variations in the size and income of the Montana livestock ranches included in this study. The 29 per cent of all ranches which were smallest in size (under 50 animal units per ranch) had (a) 5.7 per cent of all range livestock included in this study (8.7 per cent of all beef cattle and 1.6 per cent of all sheep), received (b) 8 per cent of the total net income received by all ranches, and produced (c) 6 per cent of the total gross income produced by all ranches.

The half of all ranches which were smallest in size (under 85 animal units per ranch) maintained (a) 10 per cent of total livestock numbers, received (b) 18 per cent of total net income, and produced (c) 14 per cent of total gross income.

The half of all ranches which were largest in size maintained (a) 90 per cent of total livestock numbers, received (b) 82 per cent of total

net income, and produced (c) 86 per cent of total gross income.

The 14 per cent of all ranches which were largest in size (over 300 animal units per ranch) maintained (a) 57 per cent of total livestock numbers (59 per cent of all sheep and 32 per cent of all cattle), received (b) 46 per cent of total net income, and produced (c) 58 per cent of total gross income.

Different kinds of ranch organization are generally different with respect to size, and income. A larger proportion of all cattle ranches were among the smaller sized and low income groups of ranches than was characteristic of sheep or combination cattle and sheep outfits. These general differences are indicated in the following median comparisons. One-half of all cattle ranches had (a) fewer than 71 animal units of range livestock per ranch, received (b) less than \$638 net annual income from ranch enterprises, and produced (c) less than \$1074 gross annual income.

One-half of all combination (cattle and sheep) ranches maintained (a) fewer than 99 animal units of range livestock per ranch, received (b) less than \$814 net annual income from ranch enterprises, and produced (c) \$2149 gross annual income.

One-half of all sheep ranches maintained (a) fewer than 194 animal units of range livestock per ranch, received (b) less than \$1207 net annual income from ranch enterprises, and produced (c) less than \$4156 gross annual income.

In general, the smaller the ranch, the greater the number of ranches; and, the smaller the ranch, the greater the number of range

livestock. Both numbers of ranches and numbers of livestock are greatest in the smaller size groups of ranches in most areas.

There is a great deal of variation in the size, income, and organization of ranches in the different counties and areas of the state.

Generally speaking, the counties in the eastern part of the state have the largest number and proportion of small and low-income livestock producing units; and conversely, the counties in the western part of the state have the greatest number and proportion of large and high-income ranches.

Cattle ranching predominates in the counties in the south-central part of the state and sheep ranching in the north-central sections. The ranches in the eastern part of the state are most diversified and the ranches in the western areas most specialized in their enterprises. Major exceptions to these tendencies are the counties in the central and western parts of the state where irrigation is practiced and where there is a diversified type of agriculture.

BIBLIOGRAPHY

1. Johnson, N. W., and Saunderson, M. H., Types of Farming in Montana, Mont. Agr. Expt. Sta. Bul. 328, October, 1936, pp. 79, illus.
2. Olsen, Bertha, Farm Family Living, A thesis submitted at Montana State College, 1937, pp. 104, illus.
3. Richardson, J. E., The Quality of Living in Montana Farm Homes, Mont. Agr. Expt. Sta. Bul. 260, April, 1932, pp. 45, illus.
4. Saunderson, M. H., Economic Changes in Montana's Range Livestock Production, Mont. Agr. Expt. Sta. Bul. 311, February, 1936, pp. 30, illus.
5. Saunderson, M. H., The Economics of Range Sheep Production in Montana, Mont. Agr. Expt. Sta. Bul. 302, June, 1935, pp. 55, illus.
6. Saunderson, M. H., and Chittenden, D. W., Cattle Ranching in Montana, Mont. Agr. Expt. Sta. Bul. 341, May, 1937, pp. 31, illus.
7. Schwann, H. E., Economic Survey of Beaverhead and Madison Counties, Montana, Forest Service Report, pp. 118, illus.
8. Wyand, C. S., The Economics of Consumption, The Macmillan Company, New York, 1937, pp. 565.

APPENDIX

TABLE A. GROSS COUNTY RANCH INCOME BY SOURCES--46 MONTANA COUNTIES

County	Total Gross Income	Per cent by Source				
		Cattle	Sheep	Horses	Other	Crop
Beaverhead	\$ 3,325,169	59.7	39.1	1.1	---	.1
Big Horn	1,901,539	73.9	25.2	.3	.2	.4
Powder River	1,455,261	80.6	17.2	.8	.5	.9
Madison	1,367,224	56.5	42.5	.7	.2	.1
Carter	1,341,852	53.5	43.7	.7	.5	1.6
Blaine	1,338,302	42.2	55.6	.8	.5	.9
Custer	1,273,218	74.6	17.4	4.2	.4	3.4
Glacier	1,171,128	25.0	73.7	1.0	.3	---
Rosebud	1,158,915	60.0	36.2	.8	.1	2.9
Meagher	1,135,800	33.9	65.4	.6	.1	---
Phillips	1,049,916	45.4	48.4	1.3	.2	4.7
Lewis & Clark	1,045,428	56.7	41.6	.4	.2	1.1
Garfield	1,017,597	44.0	48.7	2.2	.1	5.0
Park	928,900	52.6	44.2	.5	1.2	1.5
Chouteau	906,484	67.3	28.7	.5	.6	2.9
Valley	843,671	32.4	60.9	1.4	.7	4.6
Powell	839,716	56.2	42.0	.8	.9	.1
Sweet Grass	838,722	49.6	48.0	.4	.8	1.2
Cascade	834,643	59.5	36.7	.3	.7	2.8
Yellowstone	795,948	51.4	43.7	.6	.3	4.0
Teton	783,096	42.9	54.6	.1	.7	1.7
Gallatin	686,350	64.4	28.6	.5	2.4	4.1
Wheatland	670,666	44.7	52.7	.3	.4	1.9
Carbon	637,417	50.4	43.3	.2	.8	5.3
Toole	629,870	38.1	59.0	.4	.1	2.4
McCone	613,960	46.6	44.8	2.0	---	6.6
Richland	593,527	36.2	51.3	.2	.8	11.5
Dawson	543,417	57.6	33.9	1.3	.3	6.9
Judith Basin	493,085	65.8	30.1	.3	.3	3.5
Fergus	457,081	58.2	36.6	1.5	1.0	2.7
Stillwater	456,903	52.8	41.3	.5	1.0	4.4
Broadwater	430,644	42.6	53.9	.4	1.8	1.3
Musselshell	417,970	60.8	33.0	.5	.4	5.3
Jefferson	364,560	79.7	19.0	.3	1.0	---
Hill	331,733	60.8	33.7	.8	.2	4.5
Pondera	311,395	22.3	73.0	.1	.1	4.5
Golden Valley	298,270	53.7	39.8	1.0	.4	5.1
Petroleum	295,758	50.5	47.4	.8	.7	.6
Prairie	286,723	39.2	54.8	2.5	.1	3.4

TABLE A, sheet 2

County	Total Gross Income	Per cent by Source				
		Cattle	Sheep	Horses	Other	Crop
Liberty	\$ 253,794	63.4	31.9	.8	---	3.9
Fallon	245,523	62.3	27.9	1.5	1.8	6.5
Sheridan	223,995	48.1	36.1	.7	.5	14.6
Roosevelt	200,048	57.0	33.9	1.5	.3	7.3
Treasure	198,493	88.2	7.3	1.3	.1	3.1
Daniels	171,840	37.9	52.8	2.1	.2	7.0
Wibaux	114,447	73.1	19.7	.5	.4	6.3
	\$ 35,280,048	54.4	41.8	.9	.5	2.4

TABLE B. CUMULATIVE PERCENTAGE DISTRIBUTION OF RANCHES BY 7
GROSS INCOME CLASSES--35 MONTANA COUNTIES

Counties (35)	Number Ranches	Gross Income Classes						
		\$500- 999	\$1000- 1999	\$2000- 2999	\$3000- 4999	\$5000- 9999	\$10,000- 19,999	Over \$20,000
ALL RANCHES	7652	26.9	55.1	69.6	81.6	92.9	97.4	100
Treasure	83	44.6	69.9	82.0	90.4	97.6	---	100
Prairie	116	39.7	58.7	76.8	87.1	97.4	99.1	100
Fergus	211	39.3	70.6	83.9	92.0	97.2	99.1	100
Daniels	41	34.1	58.5	65.8	78.0	90.2	95.1	100
Yellowstone	262	33.6	64.1	75.6	88.2	94.7	98.1	100
Gallatin	241	33.2	64.7	80.5	88.0	96.7	97.9	100
Rosebud	296	32.4	55.0	64.5	79.7	91.2	97.3	100
Fallon	122	31.9	64.8	83.6	94.3	99.2	100.0	---
Dawson	218	31.2	63.3	78.0	89.4	97.2	99.5	100
Big Horn	313	30.9	57.1	66.7	79.2	89.1	93.6	100
Wibaux	65	30.8	63.1	84.6	100.0	---	---	---
Stillwater	202	30.7	59.4	81.7	92.1	98.5	99.5	100
Sweet Grass	235	29.8	52.4	66.4	77.9	93.2	97.9	100
Pondera	67	29.8	49.2	64.1	71.6	88.0	95.5	100
Chouteau	243	29.2	57.6	71.2	81.9	93.0	97.9	100
Park	226	28.0	54.9	67.7	77.9	93.8	98.2	100
Powder River	468	27.1	58.2	72.0	84.4	93.3	99.1	100
McCone	244	27.0	56.9	78.3	88.9	95.9	100.0	---
Garfield	385	26.5	60.2	75.8	88.0	97.6	99.2	100
Jefferson	107	26.2	56.1	68.2	81.3	93.5	100.0	---
Lewis & Clark	224	25.4	52.6	69.1	78.5	91.9	96.4	100
Carter	477	25.3	56.5	71.3	83.5	96.9	100.0	---
Cascade	254	24.8	56.3	71.7	84.3	94.9	98.8	100
Broadwater	111	24.3	61.2	73.9	91.0	94.6	97.3	100
Carbon	220	24.1	58.6	74.1	90.0	96.8	99.1	100
Richland	183	24.0	53.0	68.4	78.2	94.0	98.9	100
Meagher	143	23.1	44.0	54.5	65.0	78.3	88.8	100
Blaine	283	23.0	50.9	65.0	76.0	92.6	96.8	100
Glacier	146	22.6	44.5	61.0	68.5	80.8	91.8	100
Custer	290	21.4	47.2	62.4	76.9	91.0	96.9	100
Teton	176	21.0	49.4	63.6	77.2	89.7	98.9	100
Toole	149	20.9	46.4	61.8	72.5	89.9	98.0	100
Madison	329	20.4	47.4	62.0	78.7	92.4	96.7	100
Powell	162	20.4	44.5	57.4	73.5	88.3	95.7	100
Beaverhead	360	14.7	35.3	48.4	60.1	78.4	88.1	100

TABLE C. NET RANCH COUNTY INCOME BY SOURCES--46 MONTANA COUNTIES

County	Total Net Income	Per cent by Source				
		Sheep	Beef	Horses	Other	Crop
Beaverhead	\$ 806,985	31.5	65.9	2.4	---	.2
Big Horn	493,049	18.2	80.1	.7	.3	.7
Powder River	480,310	13.3	83.5	1.1	.7	1.4
Carter	437,828	35.5	60.1	1.1	.8	2.5
Custer	409,975	12.4	75.2	6.5	.7	5.2
Madison	408,242	34.7	63.7	1.2	.3	.1
Blaine	363,097	42.1	53.7	1.5	1.0	1.7
Rosebud	346,927	29.2	64.3	1.4	.2	4.9
Garfield	327,018	36.9	51.7	3.4	.2	7.8
Phillips	315,367	34.2	55.4	2.2	.3	7.9
Lewis & Clark	290,395	29.3	67.7	.7	.4	1.9
Chouteau	280,517	20.1	73.4	.8	1.0	4.7
Glacier	273,392	62.6	34.7	2.1	.6	---
Park	269,712	33.4	61.2	.7	2.1	2.6
Cascade	263,759	26.7	67.2	.5	1.2	4.4
Meagher	262,928	54.5	44.0	1.3	.2	---
Sweet Grass	251,903	38.6	57.4	.7	1.3	2.0
Yellowstone	244,844	32.5	59.5	1.0	.6	6.4
Valley	236,736	48.0	40.1	2.6	1.2	8.1
Powell	232,553	31.9	64.9	1.4	1.7	.1
Teton	220,996	43.9	51.6	.2	1.3	3.0
Carbon	204,253	32.5	57.7	.4	1.2	8.2
McCone	201,656	33.0	53.9	3.0	.1	10.0
Gallatin	199,704	24.0	64.1	.8	4.1	7.0
Richland	196,156	39.6	41.3	.4	1.2	17.5
Toole	183,855	48.4	46.7	.7	.1	4.1
Dawson	183,171	25.6	62.0	1.8	.4	10.2
Wheatland	179,996	43.5	51.7	.6	.7	3.5
Stillwater	156,428	32.1	59.2	.7	1.4	6.6
Forgeus	154,241	27.6	64.7	2.3	1.5	3.9
Judith Basin	150,914	23.8	69.4	.5	.5	5.8
Musselshell	137,039	26.5	63.9	.9	.6	8.1
Jefferson	118,846	14.9	83.2	.5	1.4	---
Broadwater	117,265	37.4	56.3	.8	3.2	2.3
Hill	115,050	25.8	66.2	1.2	.3	6.5
Golden Valley	99,747	29.2	61.1	1.5	.6	7.6
Prairie	91,720	43.3	47.4	4.0	.1	5.2
Fallon	90,486	21.6	65.1	2.0	2.4	8.9
Petroleum	90,068	35.9	60.6	1.3	1.2	1.0
Liberty	85,341	24.0	69.0	1.2	---	5.8
Pondera	84,186	59.9	31.2	.2	.3	8.3
Sheridan	78,255	24.0	53.4	.9	.7	21.0
Treasure	65,763	6.8	86.4	1.9	.3	4.6
Roosevelt	60,513	24.4	60.4	2.5	.5	12.2
Daniels	50,544	38.2	46.1	3.5	.3	11.9
Wibaux	43,086	15.2	75.0	.7	.8	8.3
TOTALS	\$10,355,516	31.9	61.5	1.6	.8	4.2

TABLE D. CUMULATIVE PERCENTAGE DISTRIBUTION OF RANCHES BY 6
NET INCOME CLASSES--35 MONTANA COUNTIES

Counties (35)	Number Ranches	Net Income Classes					
		\$150- 499	\$500- 999	\$1000- 1999	\$2000- 2999	\$3000- 3999	Over \$4000
TOTAL	7652	36.5	65.7	86.4	92.6	96.1	100
Fergus	211	50.7	82.0	92.9	97.2	99.1	100
Treasure	83	50.6	74.7	95.2	96.4	97.6	100
Prairie	116	47.4	74.1	93.1	97.4	98.3	100
Yellowstone	262	46.2	73.3	90.9	93.5	96.9	100
Sweet Grass	235	44.7	61.7	88.5	93.6	96.2	100
Gallatin	241	44.0	74.7	93.0	96.7	97.9	100
Fallon	122	43.4	86.8	97.5	99.2	100.0	100
Stillwater	202	41.6	73.8	96.6	98.5	99.5	100
Wibaux	65	41.5	84.6	100.0			
Daniels	41	41.5	65.9	78.1	90.3	100.0	
Carter	477	39.6	67.5	90.6	97.5	99.4	100
Big Horn	313	39.3	63.3	81.5	87.9	92.4	100
Rosebud	296	39.2	61.9	85.5	91.6	95.3	100
Powder River	468	37.8	66.8	88.0	93.1	95.7	100
Carbon	220	37.3	71.3	90.8	97.2	98.6	100
Broadwater	111	36.9	73.7	90.7	93.4	95.2	100
McCone	244	36.9	81.2	94.7	96.7	100.0	
Chouteau	243	36.6	64.2	84.8	91.0	95.9	100
Lewis & Clark	224	36.2	63.0	80.9	88.0	94.2	100
Park	226	35.4	61.5	85.8	93.3	97.3	100
Dawson	218	35.3	77.0	90.8	98.1	99.5	100
Cascade	254	35.0	63.8	88.6	93.7	98.0	100
Blaine	283	34.7	62.2	84.8	91.9	95.1	100
Garfield	385	34.6	74.1	92.5	98.2	99.0	100
Teton	176	33.5	59.1	79.6	89.3	95.5	100
Richland	183	32.8	62.9	85.8	94.0	97.8	100
Jefferson	107	32.7	60.7	86.7	90.4	95.2	100
Meagher	143	31.5	51.0	72.0	79.7	87.4	100
Powell	162	30.9	54.4	79.6	88.8	93.8	100
Custer	290	30.7	56.9	83.5	90.3	97.9	100
Pondera	67	29.9	59.8	83.7	92.5	100.0	
Toole	149	29.5	59.7	79.8	89.9	96.6	100
Madison	329	28.2	58.6	84.4	91.7	95.7	100
Glacier	146	28.1	57.5	73.9	80.1	90.4	100
Beaverhead	360	21.7	42.8	65.5	78.3	84.7	100

TABLE E. CUMULATIVE PERCENTAGE DISTRIBUTION OF RANCHES AND LIVESTOCK BY 12 SIZE CLASSES—
46 MONTANA COUNTIES (Counties listed according to the percentage of ranches over 100 A.U. per ranch)

Size in A.U. per Ranch	Beaverhead		Meagher		Glacier		Toole		Powell		Madison		Custer	
	Operators (360)	Livestock (166,089 A.U.)	Operators (145)	Livestock (56,734 A.U.)	Operators (146)	Livestock (52,336 A.U.)	Operators (149)	Livestock (30,728 A.U.)	Operators (162)	Livestock (41,564 A.U.)	Operators (329)	Livestock (63,195 A.U.)	Operators (290)	Livestock (61,267 A.U.)
25-50	100	100	100	100	100	100	100	100	100	100	100	100	100	100
51-100	84.7	98.8	76.2	97.7	77.4	98.0	79.2	96.6	78.4	97.0	79.3	96.4	75.8	95.7
101-150	63.3	95.3	55.9	94.1	54.8	93.9	53.7	87.5	53.7	90.3	52.6	86.7	50.3	97.0
151-200	51.4	92.0	44.7	90.6	39.0	89.0	36.3	77.3	40.7	83.9	38.3	78.2	35.5	78.3
201-300	44.7	89.4	38.4	87.9	35.6	87.5	32.9	74.6	31.4	77.5	26.7	68.6	28.3	72.2
301-500	34.4	83.8	31.4	83.4	30.1	84.3	24.2	64.3	20.3	66.7	14.3	54.1	16.9	58.8
501-750	21.6	73.2	21.6	73.8	19.1	73.9	9.4	35.9	11.7	53.6	7.8	41.2	9.0	43.7
751-1000	15.2	64.8	15.3	64.4	11.6	61.9	4.0	20.7	7.4	43.1	4.8	32.5	3.3	29.0
1001-1500	11.9	58.6	11.2	55.8	8.3	54.3	2.0	12.4	4.3	33.0	3.5	26.6	3.1	26.4
1501-2000	6.9	45.9	—	—	3.5	40.0	.7	5.2	2.4	24.8	1.2	14.5	2.1	20.4
2001-3000	3.9	34.9	4.2	32.9	2.8	36.7	—	—	1.8	20.8	.9	11.8	1.1	11.8
Over 3000	1.7	23.5	2.8	24.7	1.4	23.3	—	—	.6	8.4	.3	5.5	.4	5.0

TABLE E, sheet 2.

Size in A.U. per Ranch	Teton		Judith Basin		Pondera		Wheatland		Blaine		Lewis & Clark		Sweetgrass	
	Operators (176)	Livestock (58,203 A.U.)	Operators (123)	Livestock (23,712 A.U.)	Operators (67)	Livestock (14,847 A.U.)	Operators (126)	Livestock (32,780 A.U.)	Operators (283)	Livestock (65,942 A.U.)	Operators (224)	Livestock (51,538 A.U.)	Operators (235)	Livestock (41,115 A.U.)
25-50	100	100	100	100	100	100	100	100	100	100	100	100	100	100
51-100	76.7	96.1	69.9	94.1	70.2	95.2	74.6	96.2	75.6	96.3	71.9	95.5	68.5	93.4
101-150	48.9	87.1	48.8	86.1	47.8	87.8	47.6	89.0	47.3	87.8	46.4	87.5	45.5	84.1
151-200	35.8	79.6	37.4	79.0	35.9	81.4	37.3	83.9	33.9	80.8	29.9	78.6	31.9	74.5
201-300	29.5	74.5	26.0	68.8	26.9	74.6	30.2	79.0	30.0	78.0	24.1	74.1	26.4	69.3
301-500	18.7	62.4	13.0	52.9	19.4	66.1	19.9	69.2	19.4	66.8	19.2	69.0	17.5	56.4
501-750	10.2	46.7	9.7	46.4	11.9	53.2	13.6	59.7	7.4	47.9	8.0	51.0	6.4	32.9
751-1000	5.7	34.5	5.2	25.7	—	—	9.6	50.7	4.2	39.9	5.8	45.1	3.8	24.1
1001-1500	—	—	2.4	21.5	4.4	34.9	7.2	42.4	3.1	36.3	3.6	36.3	2.1	15.5
1501-2000	1.2	16.4	1.6	16.9	—	—	2.4	18.9	1.7	26.3	2.7	31.7	.4	4.3
2001-3000	—	—	—	—	1.4	17.3	.8	8.1	—	—	1.8	24.8	—	—
Over 3000	.6	11.8	—	—	—	—	—	—	.7	20.5	.9	14.8	—	—

TABLE E, sheet 3.

Size in A.U. per Ranch	Rosebud		Musselshell		Jefferson		Big Horn		Park		Liberty		Custer	
	Operators (238)	Livestock (58,176 A.U.)	Operators (127)	Livestock (19,702 A.U.)	Operators (107)	Livestock (18,052 A.U.)	Operators (813)	Livestock (94,557 A.U.)	Operators (226)	Livestock (45,176 A.U.)	Operators (85)	Livestock (12,194 A.U.)	Operators (477)	Livestock (65,647 A.U.)
25-50	100	100	100	100	100	100	100	100	100	100	100	100	100	100
51-100	66.9	85.8	67.7	82.4	72.0	94.1	87.4	86.2	70.6	94.7	70.6	82.8	75.4	85.0
101-150	44.9	85.3	44.1	81.1	44.0	82.0	42.8	80.2	42.5	84.2	42.4	78.1	41.7	76.6
151-200	35.1	78.8	32.5	71.6	30.9	72.5	32.3	86.0	32.8	78.1	34.8	68.3	27.9	64.3
201-300	25.6	70.1	19.7	57.6	27.1	63.1	26.5	82.8	24.4	70.4	18.9	56.4	21.0	55.4
301-500	15.2	56.5	14.2	49.8	11.2	44.8	17.8	75.8	13.9	60.8	11.8	44.8	15.2	41.6
501-750	8.3	43.1	4.8	24.8	6.5	31.2	10.8	66.6	5.8	40.0	7.1	33.7	3.1	14.9
751-1000	5.4	28.5	—	—	3.7	20.3	8.0	61.3	2.7	30.8	1.2	7.5	.6	4.2
1001-1500	2.7	23.4	1.8	11.7	—	—	6.4	56.8	1.8	26.6	—	—	—	—
1501-2000	1.7	17.3	—	—	—	—	4.8	50.1	—	—	—	—	—	—
2001-3000	.3	5.2	—	—	—	—	2.6	37.8	—	—	—	—	—	—
Over 3000	—	—	—	—	—	—	1.6	29.7	.9	21.3	—	—	—	—

TABLE E, sheet 4.

Size in A.U. per Ranch	Chouteau		Phillips		Cascade		Powder River		Petroleum		Carbon		Richland	
	Operators (243)	Livestock (43,731 A.U.)	Operators (239)	Livestock (49,892 A.U.)	Operators (254)	Livestock (40,259 A.U.)	Operators (468)	Livestock (71,766 A.U.)	Operators (94)	Livestock (14,584 A.U.)	Operators (220)	Livestock (29,941 A.U.)	Operators (183)	Livestock (26,021 A.U.)
25-50	100	100	100	100	100	100	100	100	100	100	100	100	100	100
51-100	69.5	93.7	71.3	93.7	72.8	93.7	71.6	93.2	70.2	92.7	63.2	91.2	69.9	92.5
101-150	41.5	82.4	41.5	81.6	40.9	79.4	40.2	78.5	39.3	78.9	38.7	76.1	39.2	76.7
151-200	27.9	73.1	26.6	71.1	24.8	66.5	23.7	67.5	26.5	69.1	23.2	61.7	27.8	67.7
201-300	22.1	67.7	19.3	63.6	17.3	58.0	20.1	59.8	18.0	59.2	13.7	49.6	24.0	63.0
301-500	14.3	57.1	10.3	50.1	12.2	49.9	11.1	45.1	12.7	51.0	3.7	40.9	12.5	42.2
501-750	6.1	38.6	4.1	36.5	4.3	30.0	6.4	32.7	6.3	36.1	3.3	25.3	4.9	23.2
751-1000	2.8	23.3	2.0	23.9	2.7	23.1	3.0	18.8	4.2	26.8	1.5	17.6	1.6	10.6
1001-1500	2.0	24.3	-----	-----	1.2	14.8	.9	6.3	2.1	16.2	1.0	15.0	.5	3.9
1501-2000	1.2	18.7	1.7	27.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
2001-3000	.8	14.7	1.0	20.2	.6	12.0	-----	-----	-----	-----	-----	-----	-----	-----
Over 3000	.4	9.7	.3	10.5	-----	-----	-----	-----	-----	-----	.5	11.5	-----	-----

TABLE E, sheet 5.

Size in A.U. per Ranch	Hill		Daniels		Prairie		Stillwater		Garfield		McCone		Broadwater	
	Operators (136)	Livestock (15,810 A.U.)	Operators (41)	Livestock (7,975 A.U.)	Operators (116)	Livestock (13,845 A.U.)	Operators (202)	Livestock (21,602 A.U.)	Operators (385)	Livestock (48,247 A.U.)	Operators (244)	Livestock (28,653 A.U.)	Operators (111)	Livestock (20,883 A.U.)
25-50	100	100	100	100	100	100	100	100	100	100	100	100	100	100
51-100	70.6	90.9	58.5	92.2	58.6	87.8	66.3	88.5	72.2	91.9	69.3	90.4	71.2	94.4
101-150	36.8	70.3	36.5	84.4	36.2	73.3	36.1	68.1	36.1	70.9	35.6	69.9	34.2	80.1
151-200	22.1	55.5	34.1	83.1	19.8	56.2	16.3	45.4	22.6	57.7	19.7	54.2	24.3	73.8
201-300	15.5	45.6	29.2	79.2	12.9	46.5	10.9	36.7	15.3	47.8	14.4	46.2	16.2	65.8
301-500	7.4	27.8	14.6	60.7	7.7	34.7	4.0	21.0	7.8	32.7	7.8	32.5	9.9	58.0
501-750	3.0	14.5	-----	-----	2.5	20.1	1.5	11.4	2.4	15.9	3.7	19.6	5.4	49.5
751-1000	-----	-----	7.3	46.4	1.7	15.2	-----	-----	1.4	11.1	-----	-----	3.6	43.8
1001-1500	-----	-----	4.9	34.0	.8	9.6	.5	5.9	.6	5.7	-----	-----	-----	-----
1501-2000	-----	-----	-----	-----	-----	-----	-----	-----	.3	3.4	-----	-----	2.7	39.8
2001-3000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Over 3000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.8	31.8

TABLE E, sheet 6.

Size in A. U. per Ranch	Valley		Yellowstone		Golden Valley		Wibaux		Roosevelt		Fallon		Sheridan	
	Operators (230)	Livestock (59,983 A.U.)	Operators (262)	Livestock (38,070 A.U.)	Operators (116)	Livestock (14,100 A.U.)	Operators (65)	Livestock (5,339 A.U.)	Operators (62)	Livestock (9,236 A.U.)	Operators (122)	Livestock (11,251 A.U.)	Operators (90)	Livestock (9,502 A.U.)
25-50	100	100	100	100	100	100	100	100	100	100	100	100	100	100
51-100	64.3	92.7	65.3	91.2	73.3	92.4	66.2	85.6	53.2	89.3	64.7	85.5	51.1	82.9
101-150	33.9	79.7	33.6	75.9	32.8	69.4	32.4	55.5	30.6	78.4	30.3	58.3	30.0	68.2
151-200	20.0	69.8	22.5	67.2	19.9	55.6	13.9	30.6	22.5	71.8	12.3	34.7	13.3	48.4
201-300	13.5	65.4	14.5	57.5	13.9	47.4	1.6	4.6	12.8	60.2	8.2	27.5	10.0	43.2
301-500	10.0	58.5	9.2	48.5	7.0	34.0	-----	-----	-----	-----	2.4	12.9	4.4	29.7
501-750	6.9	52.2	5.0	37.2	3.5	22.6	-----	-----	4.8	47.0	.8	5.6	-----	-----
751-1000	3.4	39.3	2.7	27.5	1.8	14.1	-----	-----	-----	-----	-----	-----	-----	-----
1001-1500	2.1	32.7	1.9	22.7	.9	7.9	-----	-----	-----	-----	-----	-----	2.2	22.0
1501-2000	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
2001-3000	.8	22.9	.8	12.6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Over 3000	.4	16.9	-----	-----	-----	-----	-----	-----	1.6	34.9	-----	-----	-----	-----

TABLE E, sheet 7.

Size in A.U. per Ranch	Dawson		Treasure		Gallatin		Fergus	
	Operators (218)	Livestock (25,207 A.U.)	Operators (83)	Livestock (9,602 A.U.)	Operators (241)	Livestock (32,025 A.U.)	Operators (211)	Livestock (22,016 A.U.)
25-50	100	100	100	100	100	100	100	100
51-100	64.2	88.8	54.2	85.4	63.5	90.1	58.3	85.8
101-150	29.3	67.1	27.7	68.0	27.4	70.4	26.1	63.7
151-200	18.3	54.9	15.6	54.7	17.4	61.1	15.7	51.1
201-300	11.9	45.5	10.8	47.5	14.5	57.3	11.0	43.3
301-500	6.9	35.0	4.8	34.8	5.8	41.3	5.8	31.6
501-750	2.8	21.6	3.6	31.0	3.3	33.9	2.9	21.7
751-1000	1.4	13.3	—	—	2.5	30.1	—	—
1001-1500	—	—	—	—	2.1	27.6	1.0	11.3
1501-2000	.5	6.5	1.2	17.9	1.2	19.9	—	—
2001-3000	—	—	—	—	.4	8.9	—	—
Over 3000	—	—	—	—	—	—	—	—

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