

JUNE, 1953

RESEARCH BULLETIN 520

UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION

J. H. LONGWELL, *Director*

Economic Position of the Dairy Industry in Missouri

C. C. Erwin



(Publication Authorized April 2, 1953)

COLUMBIA, MISSOURI

TABLE OF CONTENTS

| | |
|--|----|
| INTRODUCTION | 3 |
| Objectives of the Study | 3 |
| Procedures and Sources of Data | 4 |
| THE AGRICULTURE OF MISSOURI | 5 |
| General Characteristics | 6 |
| Physical and economic aspects | 6 |
| Land utilization | 6 |
| Type-of-Farming Areas in Missouri | 7 |
| The major type-of-farming areas | 7 |
| Area type-of-farming characteristics | 8 |
| Relation of Dairying to Other Farm Enterprises in Missouri | 10 |
| Importance of the principal crops | 10 |
| Dairying related to other livestock enterprises | 13 |
| Recent Trends in the Milk Supply and Disposition | 15 |
| Production of milk on farms | 15 |
| Disposition of milk from farms | 15 |
| INTER-AREA ASPECTS OF THE MISSOURI DAIRY | |
| INDUSTRY | 18 |
| Inter-Area Comparisons Concerning the Milk Supply | 18 |
| Cow population by areas | 18 |
| Milk production by areas | 21 |
| Alternative Opportunities Within the Principal Areas | |
| of Supply | 22 |
| Importance of farm crops | 22 |
| Emphasis placed on livestock | 23 |
| Off-farm opportunities | 25 |
| General Economic Factors Affecting the Place of Dairying | 26 |
| Average size of farms | 27 |
| Commodity-price ratios | 28 |
| The balance of pasture | 29 |
| Farmers' Attitudes Toward Dairying | 31 |
| UTILIZATION OF THE MISSOURI MILK PRODUCTION | 33 |
| Utilization of Milk in the Principal Dairy Products | 33 |
| Utilization trends from 1925 to 1938 | 33 |
| Utilization trends from 1938 to 1950 | 34 |
| Trends in the Overall Utilization of Milk | 36 |
| Missouri's National Rank in Various Phases of the Dairy | |
| Industry | 38 |
| SUMMARY | 40 |

ACKNOWLEDGMENT

This bulletin is a report on Department of Agricultural Economics research project No. 93, "Marketing Dairy Products."

Economic Position of the Dairy Industry of Missouri

C. C. ERWIN*

INTRODUCTION

Dairying constitutes an important source of income to Missouri farmers. During the past quarter century, the sale of dairy products has contributed from 10 to 15 per cent of the total cash farm income. The sale of cull cows and veal calves, plus the value of milk and cream used on farms, provides an additional increment to the dairy income. Hence, it is estimated that during recent years from 15 to 20 per cent of the total Missouri farm income may be attributed to dairying.

Preliminary investigation indicates that considerable shifts both in the areas of production and in the output of different types of dairy products have occurred during recent years. Some of the areas which were formerly important have lost much of their earlier significance, while other areas in the state have increased in importance as areas of supply. An understanding of the reasons for these changes would help to safeguard the relative economic position of dairy farmers, with respect to both their wages and capital investments, in the areas which are expanding as well as in the areas which are diminishing in importance. In this connection, it was thought that the most applicable type of inquiry to determine the economic position of the dairy industry was an inter-area analysis of the most important phases of dairying in Missouri.

Objectives of the Study

The primary objectives of this study may be stated as follows: to determine the relative importance of dairying in the agriculture of Missouri; to determine the economic position of dairying in relation to competing farm enterprises in the state; to determine the relative economic position of the dairy industry in different areas of the state; to ascertain the importance of the various dairy products produced and manufactured in the state; to reveal and analyze specific problems in the marketing of dairy products at the producer, processor, and consumer levels; and to suggest adjustments in accordance with the findings of the investigation, if such adjustments appear desirable for the future progress of the dairy industry of the state.

*This bulletin is based on a thesis submitted to the University of Illinois in partial fulfillment of the requirements for the Ph.D. Degree in Agricultural Economics.

Procedures and Sources of Data

The procedures employed in this analysis may be summarized briefly as follows. Preliminary investigation indicated that there are three areas in Missouri of primary importance in the production of dairy products, the St. Louis and Kansas City fluid-milk areas and the Southwest Missouri manufacturing area. In addition, the North Central part of the state may be designated chiefly as a cream producing area (Fig. 1). Since the dairy enterprise in this area is of secondary importance in the organization of most farms, the discussion will be centered on the other three areas.

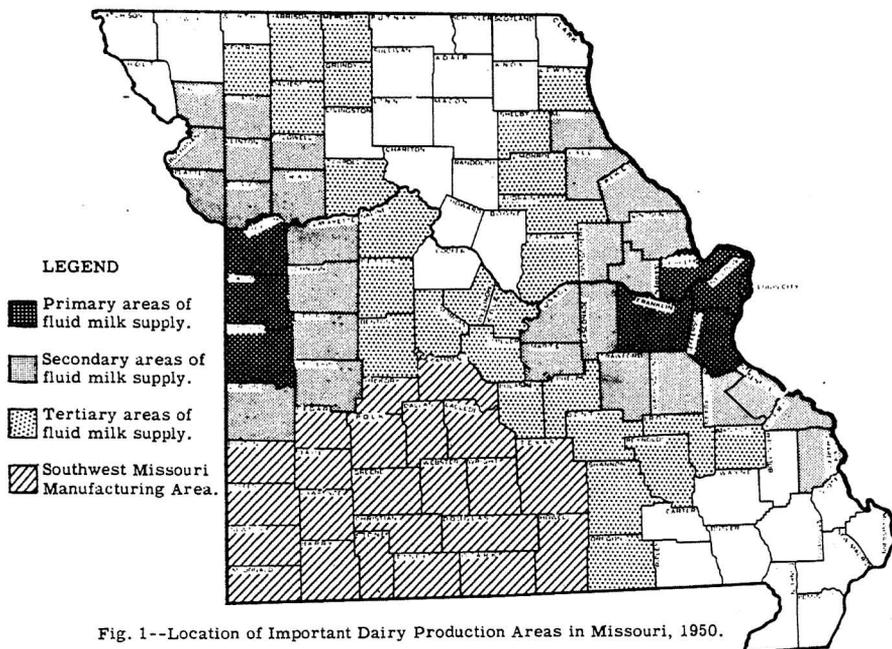


Fig. 1.--Location of Important Dairy Production Areas in Missouri, 1950.

Data relative to the general position of the dairy industry of Missouri were obtained from the following agencies: the Census Bureau of the U. S. Department of Commerce, various publications of the U. S. Department of Agriculture, and the records of the Department of Agricultural Economics of the University of Missouri. More specific data were obtained from the Missouri State Department of Agriculture, from the market administrators of the Federal order markets of St. Louis and Kansas City, and from various other agencies of the dairy industry of Missouri.

Composite data thus assembled were analyzed with the view of determining the importance of recent changes in the relative economic position of the foremost producing areas of the dairy industry of the state. Throughout the study, an attempt also was made to assess the future prospects of dairying as compared to other farm enterprises in Missouri.

THE AGRICULTURE OF MISSOURI

The agriculture of Missouri is very diversified. Both livestock and crop enterprises serve as important sources of cash farm income. During the past quarter century, however, the sale of livestock and livestock products constituted roughly three fourths of the total cash farm income, while that of crops contributed only about one fourth (Fig. 2). Of the total livestock contribution, meat animals and their

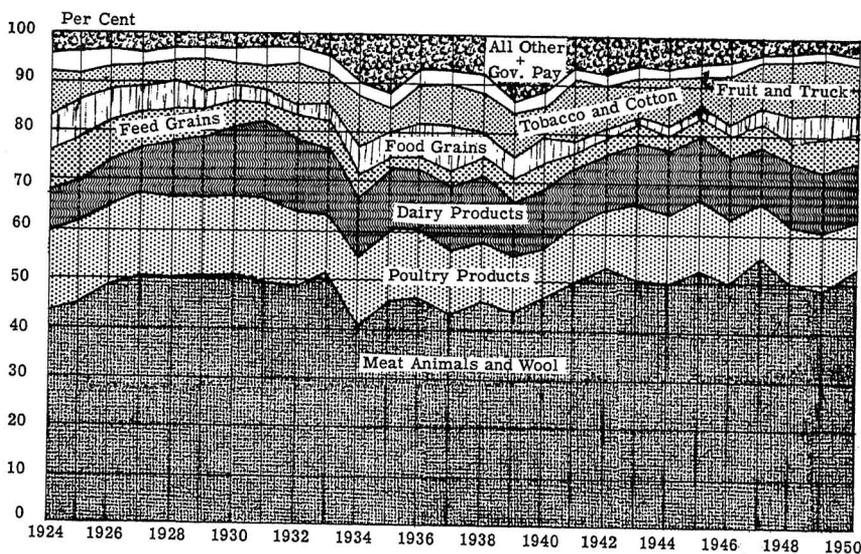


Fig. 2 -- Group Contributions to the Total Missouri Cash Farm Income, 1924-1950, See Appendix Table I)

products accounted for approximately two thirds of this income, with dairy and poultry products accounting for the other third in almost equal proportions. The remainder, or approximately one fourth of the total cash farm income, was contributed by the major grains and specialty crops.

As a background for the subsequent analysis of the dairy industry, it seems necessary at this point to consider briefly some of the overall aspects of the agriculture of Missouri. Considerations of importance in this respect are: the general characteristics of the land, dominant

type of farming areas existing in the state, the place of dairying in the agricultural industry, and some recent trends in the dairy industry.

General Characteristics

Generally favorable climatic conditions in Missouri have made possible the development of a diversified and progressive agriculture. Evidence of this may be seen from a summary presentation of some of the physical and economic aspects, which affect the agricultural industry, and the utilization of the land.

Physical and Economic Aspects.— Considerable variation exists in the topography of Missouri; the northern part is relatively level to rolling, while the south-central part, the Ozark region, is relatively rough. The Ozark region is bordered, on the west, by a comparatively level prairie-like area and, on the east, by the Mississippi valley, the extreme southeastern part of which is known as the lowlands or delta area. Furthermore, the normal annual rainfall is ample and its distribution is considered generally satisfactory for dairy production. Over the state, the normal annual precipitation ranges from 32 to 36 inches in the northwest and from 46 to 48 inches in the southeast. The length of the growing season in Missouri varies from 165 to 180 days, except in the extreme southeastern part where it averages about 195 days.

In most sections of the state, the cool humid climate, together with the sunny and occasionally dry and often hot summer period, has favored the development of husbandry based on cereal and forage crops rather than cash crops. Therefore, the early emphasis placed on dairying in various sections appears to have resulted primarily from the fact that dairying offered an intensive farm enterprise for the relatively abundant pasture production of the land, and provided also the most profitable employment of the family labor.

Land Utilization.— In order to arrive at an estimate of the physical possibilities of Missouri agriculture, it is necessary to consider not only the climatic conditions but also the general pattern of land utilization. According to the latest census data, approximately 80 per cent of the total land area of the state was in farms and devoted to one or another of several agricultural uses (Table 1). Only 30.9 per cent of the total land area, however, was designated as cropland, and only part of this may be considered highly productive. As only 11.5 per cent of the total was listed as plowable pasture, this leaves 57.6 per cent of the state's entire land area which must be designated as non-crop land.

From the standpoint of an animal husbandry system of agriculture, however, it would be more meaningful to classify the data according to pasture and forage potential. From this point of view, about 38 per

Table 1 -- Utilization of Land in Missouri, 1950¹

| Utilization | Area (acres) | Percentage of total land area (per cent) |
|-------------------------|-----------------|--|
| Land in farms: | | |
| Cropland | 13,653,044 | 30.9 |
| Plowable pasture | 5,103,949 | 11.5 |
| Woodland pasture | 5,804,522 | 13.1 |
| Other pasture | 6,036,457 | 13.6 |
| Woodland not pastured | 2,693,788 | 6.1 |
| All other land in farms | 1,831,383 | 4.1 |
| Total | 35,123,143 | 79.3 |
| Land not in farms | 9,181,497 | 20.7 |
| Total land area | 44,304,640 | 100.0 |

¹ United States Census of Agriculture, 1950, Department of Commerce, Bureau of the Census, Washington, D. C.

cent of the state's total land area may be designated as pasture, consisting of approximately equal proportions of plowable pasture, woodland pasture, and other pasture.

Hence, it would appear that it has been, and will continue to be, necessary for Missouri farmers to depend largely upon a livestock-pasture system of farming in order to develop the agricultural industry of the state to the fullest extent. Furthermore, as dairy cattle are very efficient in the conversion of pasture and roughage into products for human consumption, the dairy enterprise has an important place in the organization of the agricultural industry of Missouri, especially in those sections where farms are small and much of the land is suited best to the production of pasture and forage.

Type-of-Farming Areas in Missouri

In the preceding discussion of the general characteristics of the agriculture of Missouri, some effects of physical conditions and land utilization were taken into account. These, together with various other forces, such as soil type, biological and personal factors, and availability of markets, influence to a considerable extent the types of farming practiced. At this juncture, therefore, it seems necessary to discuss briefly the various type-of-farming areas of the state.

The Major Type-of-Farming Areas.*—Missouri has been divided into 10 major type-of-farming areas and some of these have been fur-

*For a detailed discussion of the type-of-farming areas in Missouri, see Hammar, C. H., Roth, W. J., and Johnson, O. R., *Types of Farming Areas in Missouri*, Missouri Agricultural Experiment Station Research Bulletin 284, Third Edition, Oct., 1947.

ther subdivided. Only the major areas, however, appear to be of sufficient importance to consider in this study. Perhaps at the outset, these major type-of-farming areas should be listed, and then their characteristics considered. According to the latest information compiled by the Department of Agricultural Economics of the Missouri College of Agriculture, the major type-of-farming areas are as follows:

- I. Northwest Meat Production Area
- II. Northeast Meat Production Area
- III. Sub-urban Area
- IV. Missouri-Mississippi Ozark Border Area
- V. Ozark Highland Meat Production Area
- VI. Western Grain Production Area
- VII. Southwest Dairy, Fruit, and Poultry Production Area
- VIII. Ozark Plateau Dairy Production Area
- IX. Delta Border Livestock and Cash Crop Production Area
- X. Delta Cotton and Corn Production Area

Area Type-of-Farming Characteristics.— Fully two thirds of the entire area of Missouri has been classified as predominantly meat production type-of-farming areas (Fig. 3). This classification includes all of the territory north of the Missouri river and, in addition, a vast region, known as the Ozark Highlands, located in the south-central

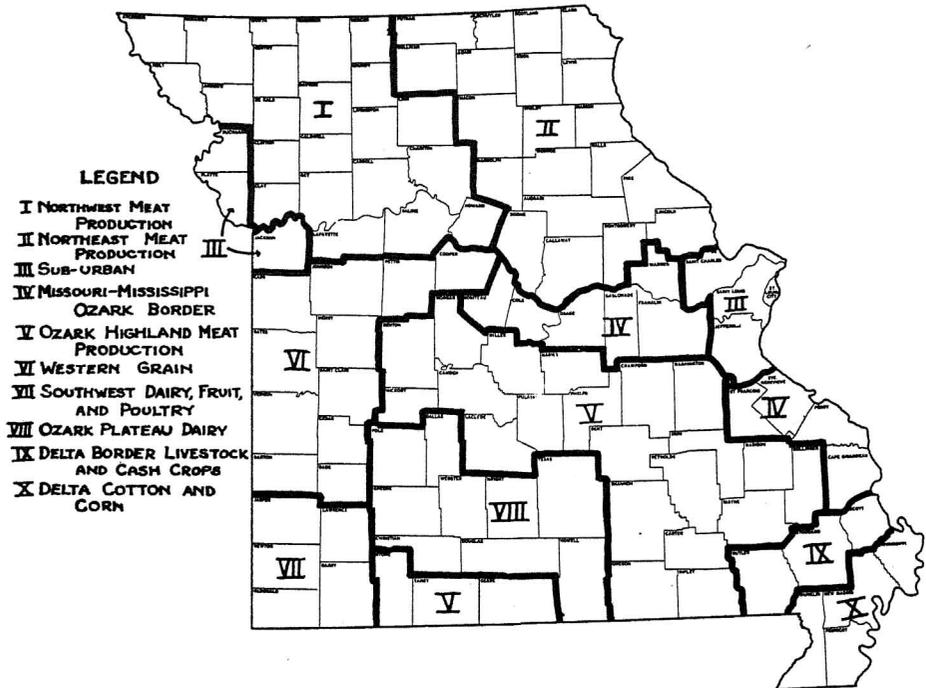


Fig. 3 -- Type of Farming Areas in Missouri.

part of the state (Areas I, II, and V). Consequently, the bulk of the farmers in Missouri are engaged in the production of meat animals and their products.

Important differences, however, exist between the northern areas and the Ozark area. First, the meat animals from the Ozark area are primarily stocker and feeder animals which are sold to farmers in areas where more adequate supplies of feed grains are available for further feeding of these animals before they are marketed. Secondly, the typical system of farm organization in the Ozarks is that of a self-sufficing type, while that of the northern areas is much more commercialized and, therefore, more dependent upon an exchange economy. Furthermore, a significant amount of the Ozark area is cut-over timber land, not organized into farms nor owned by farmers, and may be pastured only as open range. On the other hand, more than 90 per cent of the land area in the northern meat producing areas is appropriated into some kind of agricultural use. Finally, farming in the Ozark area is not nearly as highly mechanized as that in the northern areas. Doubtless, this is due to several reasons, chief among which, however, appear to be the limited area of cropland, its low inherent productivity, and the small size and irregular shape of the cultivated fields. In other words, the Ozark area may be described as a subsistence-general type-of-farming area with feeder and stocker livestock production serving as the major source of cash income, while the northern areas are essentially and principally commercialized meat producing areas.

The third major area, located immediately adjacent to the metropolitan centers of St. Louis and Kansas City, has been designated as sub-urban. In this area, agricultural production consists largely of a variety of truck crops grown for the city markets. Nevertheless, in each of the two different segments of this area, especially toward the outer fringes, the production of fluid milk on highly specialized farms for consumption in the adjacent urban markets of St. Louis and Kansas City is of great importance. Moreover, fruit and other specialty crops are of primary importance along the bluffs which follow the general courses of the Missouri and Mississippi rivers (Area IV). In the bottom lands of this area, production consists chiefly of wheat, corn, soybeans, alfalfa, and, to a lesser extent, such staple truck crops as potatoes, sweet potatoes, and cabbage intended for the cash markets of St. Louis and Kansas City.

From the standpoint of the dairy industry of the state, the most important major type-of-farming classifications are Areas VI, VII, and VIII. Although Area VI is designated primarily as a grain producing area, it serves as an important source of fluid milk for the Kansas

City market, accounting for approximately half of the total Missouri contribution to that market. Production of milk for manufacturing purposes is also of some importance in this area. Area VII is of importance not only in the production of dairy products but also in the production of fruit and poultry products. The small size of farms and small crop acreages, coupled with a favorable soil and climate, have given this area a comparative advantage in both the utilization of labor and land in the production of fruit, especially strawberries, tomatoes and grapes, as well as dairy and poultry products.

The most important dairy producing area in Missouri, and one of the most important in the nation, is the Ozark Plateau (Area VIII). While general farms may be more numerous in this area than specialized dairy farms, the concentration of dairy cows is higher and the volume of milk production is greater than in any other section of the state. Unlike the areas located in the general proximity of the primary fluid markets of St. Louis and Kansas City, the Ozark Plateau area is of importance chiefly in the production of milk for utilization in the principal manufactured dairy products, including butter, cheese, evaporated and condensed milk, and other minor products, for distribution and sale in the national market.

Finally, Areas IX and X are of principal importance in the production of cash crops. These areas are designated, respectively, Delta Border Livestock and Cash Crops and Delta Cotton and Corn. As the designations suggest, these areas are important primarily in the production of cash crops, chiefly cotton and soybeans, with livestock as a supplementary, but minor, enterprise.

Relation of Dairying to Other Farm Enterprises in Missouri

Along with the general economic development of Missouri, the agricultural industry has been shifting increasingly toward a livestock and pasture economy. As the dairy cow is very efficient in the utilization of pasture and roughage, the dairy industry has increased in its importance in relation to other farm enterprises in the agriculture of the state.

Importance of the Principal Crops.—With the development of dairying, changes have occurred also in the other segments of the agricultural industry of Missouri. During recent years, the emphasis on field crops for direct sale has decreased, while that placed on hay and pasture crops has increased (Fig. 4). The corn crop of the state has declined from an annual average of about six million acres during the 1920s and early 1930s to approximately four million acres in 1949.

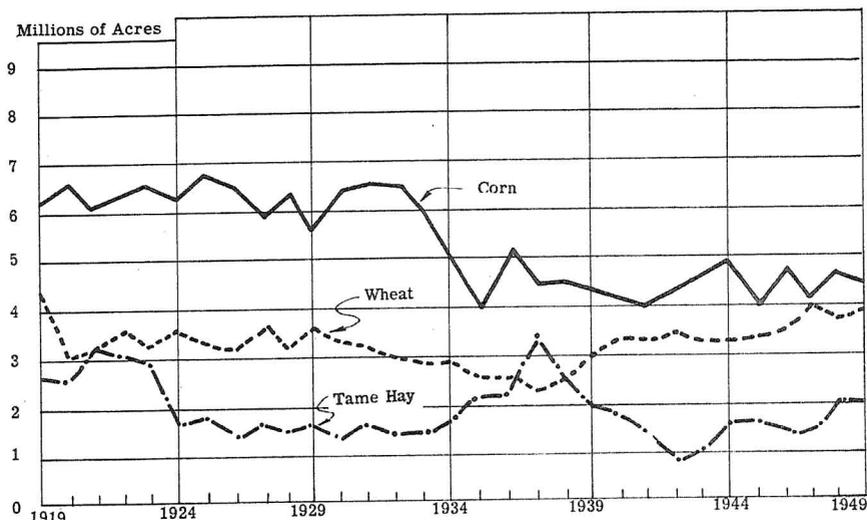


Fig. 4 -- Acreage of Corn, Wheat, and Tame Hay in Missouri, 1919-1949. (See Appendix Table II)

Also, the annual acreage of wheat dropped considerably during the 1920s, declining from approximately four and one half million acres in 1919 to about one and one third million in 1933. From 1934 to 1937, however, there was a material increase in the wheat acreage, due primarily perhaps to the emphasis which the Agricultural Extension Service placed on wheat both as a reliable cash crop and an excellent cover crop for that land of the state which is subject to serious erosion. Nevertheless, the wheat acreage declined again in the late 1930s, and reached a low point of less than a million acres in 1942. During the last few years, the trend in wheat acreage again has tended to increase, and in 1949, stood at approximately two million acres.

While the acreages of both corn and wheat in Missouri have varied greatly during the past three decades, the acreage of tame hay has remained more stable. The acreage of hay was maintained at more than three million acres during the 1920s, but dropped to an average of about two and one half million during the 1930s. Perhaps the primary reason for this decline was the added emphasis placed on pasture production during most of this period. Since the war, however, the trend in hay acreage has been upward.

Although the acreage of tame hay in the state has remained relatively stable during the past three decades, both the production and the quality of hay have increased materially (Table 2). Total production of tame hay increased from an average of 3,025 thousand tons,

Table 2 -- Acreage and Production of All Tame Hay and Lespedeza Hay in Missouri, 1921 -1949¹

| Year | All Tame Hay | | Lespedeza Hay | |
|--------------|------------------------|-------------------------------|------------------------|-------------------------------|
| | Acreage (Thousands) | Production (Thousand Tons) | Acreage (Thousands) | Production (Thousand Tons) |
| 1921-30 Ave. | 3,375 | 3,205 | ----- | ----- |
| 1931-35 Ave. | 2,857 | 2,545 | ----- | ----- |
| 1936 | 2,507 | 1,658 | 80 | 44 |
| 1937 | 2,287 | 2,430 | 300 | 285 |
| 1938 | 2,466 | 2,607 | 440 | 484 |
| 1939 | 2,898 | 3,231 | 870 | 914 |
| 1940 | 3,278 | 3,626 | 974 | 925 |
| 1941 | 3,327 | 3,515 | 1,110 | 999 |
| 1942 | 3,584 | 4,739 | 1,720 | 2,064 |
| 1943 | 3,615 | 4,112 | 1,600 | 1,600 |
| 1944 | 3,549 | 4,003 | 1,376 | 1,348 |
| 1945 | 3,754 | 4,312 | 1,651 | 1,651 |
| 1946 | 3,395 | 4,064 | 1,261 | 1,261 |
| 1947 | 3,654 | 4,197 | 1,450 | 1,450 |
| 1948 | 3,475 | 4,608 | 1,595 | 1,914 |
| 1949 | 3,592 | 4,910 | 1,755 | 2,194 |

¹ Missouri Farm Census by Counties, 1950, Missouri State Department of Agriculture, Jefferson City, Missouri.

or 1,900 pounds per acre, during the period 1921-1930 to 3,910 thousand tons, or 2,734 pounds per acre, in 1949. The only very significant exception to the upward trend in hay production during the entire period occurred in the early and middle 1930s. This resulted primarily from the prolonged drouth which affected most severely the hilly areas where the natural productivity of the soil is relatively low. The impact of adverse weather conditions affected hay production most in 1936 when it dropped to only 1,658 thousand tons, or only 1,323 pounds per acre. Since 1936, total production of tame hay in Missouri has almost tripled.

Perhaps the best available measure of improvement in the quality of hay in Missouri is the increase in production of lespedeza. At any rate, it seems to be generally agreed that the introduction of lespedeza in the 1930s provided a much needed legume for the hay and pasture mixtures recommended for the soils of medium to low productivity. Total production of lespedeza hay increased from 44 thousand tons in 1936, the first year for which production estimates are available in the state, to 2,064 thousand tons in 1942. During more recent years, lespedeza hay production has shown greater stability, amounting to 2,194 thousand tons in 1949.

In addition to the contribution which lespedeza hay has made to the dairy enterprise in Missouri, a similar contribution may be claimed for

its introduction into the pasture mixtures in the state, especially in the Southwest area where the pasture season is longest and the importance of the dairy industry is greatest. It should be noted also that the introduction of lespedeza approximately parallels in point of time quite an evident structural change in the number of milk cows kept on farms. Undoubtedly, much of this increase during the middle and late 1930s resulted from the introduction and widespread use of lespedeza.

Dairying Related to Other Livestock Enterprises.—For several years, increasing emphasis has been placed on the livestock enterprises of Missouri. As a result, a general upward trend has been apparent in the number of all classes of cattle kept on Missouri farms (Fig. 5).

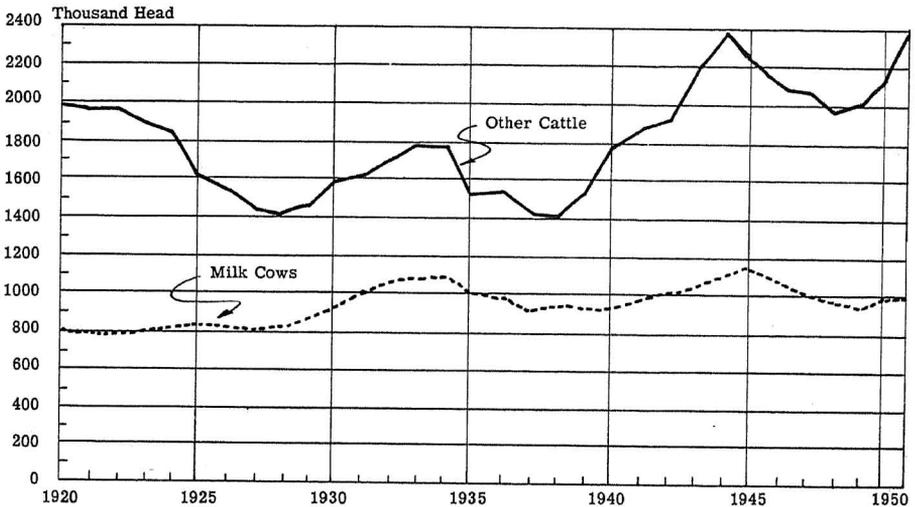


Fig. 5 -- Number of Milk Cows and Other Cattle in Missouri, 1920-1951. (See Appendix Table III)

Milk cow numbers, particularly, have shown a general upward trend during the last three decades. From 1920 to 1934, the number of milk cows on farms, as of January 1, increased from 800 thousand to a little over one million head, or approximately 36 per cent. This increase seems to have been due primarily to the more favorable economic position existing for dairying, as compared to other farm enterprises, dropped from 1934 to 1937, reflecting low yields in feed crops and remained highly stable until 1940. During the first half of the past decade, the number of milk cows again increased, reaching a high point of 1,145 thousand in 1945, then declined until 1949. Since that time,

milk cow numbers in Missouri have remained relatively stable at a little less than a million head. But the number is now approximately one fourth higher than it was a third of a century ago in 1920.

The trend in number of cattle other than milk cows has also been upward since 1938. Prior to that time, although considerable variation was apparent, the trend was downward from the two million reported on farms in 1920. It appears from the data cited that the number of cattle other than milk cows has tended to be established during recent years at slightly more than the 1920 level of two million head. Thus, the increase in forage production has largely gone into an expanded dairy industry.

In the agriculture of Missouri, livestock enterprises other than the dairy and beef enterprises are also of considerable importance. Since 1920, despite many variations, some of which were quite drastic, the hog enterprise appears to have been maintained at about four million head (Fig. 6). From 1920 to the mid-1930s, the trend in hog numbers

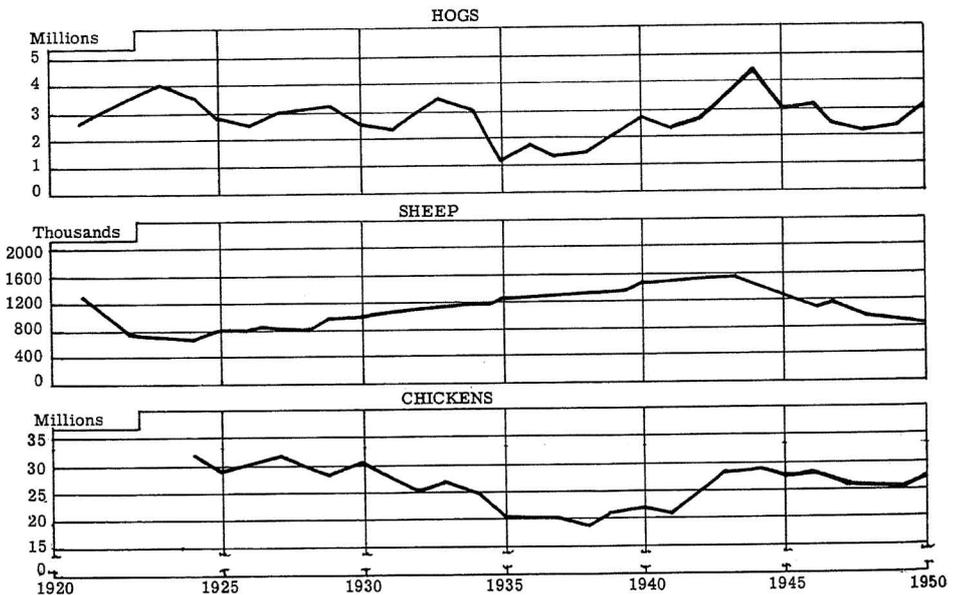


Fig. 6 -- Number of Hogs, Sheep, and Chickens in Missouri, 1920-1950. (See Appendix Table IV)

was downward, reaching a low point of less than two and one half million in 1935. However, since that time, the trend has been upward. During the very favorable period of 1942-45, the number of hogs reported on Missouri farms reached a high point of almost five and one half million.

Although of less importance than hogs, the sheep enterprise has an important place in the livestock system on many Missouri farms. As a consequence, for the past 30 years, sheep numbers have been maintained, with some variation, at about a million head.

The poultry enterprise of the state is approximately equal in importance to the dairy enterprise. Except for turkey and broiler production, of which the latter is of very recent importance, the poultry enterprise generally is not highly specialized, and chickens, like the family cow, may be found on almost all types of Missouri farms. Therefore, with the exception of a period of six years, 1935-41, the number of chickens reported on farms has averaged between 25 and 30 million for the past quarter century.

Thus, it may be concluded that the dairy enterprise has an important place in the agriculture of Missouri. As the state moves further toward a livestock-pasture system of agricultural organization, it is likely that dairying will continue to increase in importance.

Recent Trends in the Milk Supply and Disposition

As indicated already, the expansion of dairying in Missouri has been almost continuous for many years. It now seems appropriate to consider some recent trends in the overall supply and disposition of milk produced on Missouri farms.

Production of Milk on Farms.— According to information compiled by the Crop Reporting Service of the Bureau of Agricultural Economics, farm production of milk in Missouri has increased 27 per cent during the past two decades (Table 3). Except for a short period during the mid-1930s, when depression and drought were felt most, the increase in milk production has been continuous. Moreover, this increase took place in spite of the relative stability of cow numbers, which means that average production per cow increased materially during the period in question. In this connection, the annual average production per cow, while showing some variability, rose from 3,700 pounds in 1930 to 4,710 pounds in 1950.

The foregoing facts are indicative of the continuous trend toward greater specialization which is apparent almost everywhere in regard to the dairy enterprise on most farms in the state.

Disposition of Milk From Farms.— The manner in which Missouri dairy farmers disposed of their milk production remained relatively constant during the period from 1924 to 1934. Since 1934, however, significant changes in disposition have occurred, the most important of

Table 3 -- Number of Cows, Production Per Cow, and Total Annual Milk Production in Missouri, 1930-1950¹

| Year | Number of Cows on Farms ² (Thousand head) | Total Milk Production (Millions of pounds) | Average Annual Production Per Cow ³ (Pounds) |
|------|---|--|--|
| 1930 | 938 | 3,472 | 3,700 |
| 1931 | 991 | 3,627 | 3,660 |
| 1932 | 1,037 | 3,650 | 3,520 |
| 1933 | 1,068 | 3,578 | 3,350 |
| 1934 | 1,047 | 3,371 | 3,220 |
| 1935 | 972 | 3,363 | 3,460 |
| 1936 | 936 | 3,014 | 3,220 |
| 1937 | 898 | 3,053 | 3,400 |
| 1938 | 895 | 3,270 | 3,650 |
| 1939 | 884 | 3,271 | 3,700 |
| 1940 | 903 | 3,386 | 3,750 |
| 1941 | 930 | 3,562 | 3,830 |
| 1942 | 960 | 3,715 | 3,870 |
| 1943 | 995 | 3,751 | 3,770 |
| 1944 | 1,040 | 3,994 | 3,840 |
| 1945 | 1,025 | 4,192 | 4,090 |
| 1946 | 970 | 4,171 | 4,300 |
| 1947 | 941 | 4,103 | 4,360 |
| 1948 | 916 | 4,122 | 4,500 |
| 1949 | 920 | 4,342 | 4,720 |
| 1950 | 939 | 4,423 | 4,710 |

¹ Data secured direct from State Statistician, Crop Reporting Service, Bureau of Agricultural Economics, Columbia, Missouri.

² Average number on farms during year; heifers that have not freshened excluded.

³ Excludes milk sucked by calves.

which were the decrease in sales of farm butter and cream and the increase in sales of whole milk (Fig. 7). Butter and cream sales by farmers decreased from more than 50 per cent of the total production in 1934 to approximately 19 per cent in 1949. On the other hand, the sale of whole milk to plants increased rather consistently from about 12 per cent of the total in 1934 to 59 per cent in 1949. Furthermore, milk fed or consumed on farms decreased steadily during this period, and in 1949 amounted to only 19 per cent of the total production.

These trends indicate clearly that during recent years great changes have taken place in the commercial use of milk and milk products in Missouri. In this respect, the most significant changes have to do with the increase in sales of whole milk for utilization in various manufactured dairy products and the decrease in sales of farm butter and butterfat sold as cream. These changes have brought Missouri to the forefront in importance as a source of supply of a greater variety of manu-

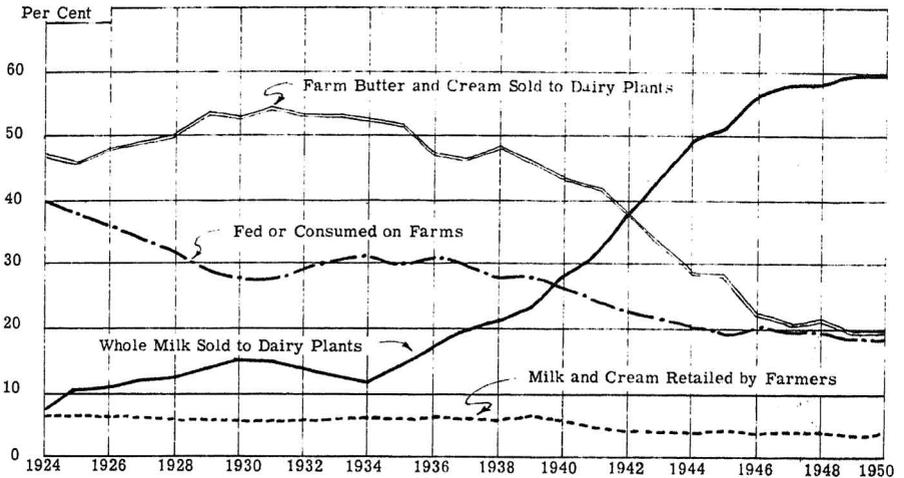


Fig. 7 -- Disposition of Milk Production in Missouri, 1924-1950.(See Appendix Table V)

factured products, and have made available a considerably greater per cent of the milk solid-not-fat for use as human food rather than animal feed.

The general changes in disposition of farm milk appear to be due to the following reasons. For many years, the demand for farm butter and farm separated cream has decreased, while the demand for whole milk both for manufacture into the various dairy products and for immediate consumption in the bottled trade has increased. Therefore, price differences have provided sufficient incentive for the commercialized dairy farmer to change his operations with the changing conditions. However, on the basis of general information, considerable differences in the pattern of disposition appear from one area to another, and these involve other considerations. Perhaps in areas, such as Southwest Missouri, where dairying is a major farm enterprise, farmers adjust their operations more quickly to changing economic conditions than in areas, such as North Central Missouri, where dairying is a minor enterprise in the organization of most farms. Moreover, much depends upon the organization of marketing facilities in order for farmers to be able to take advantage of the changes in consumer preferences for specific products. In this respect, the orderly marketing of whole milk from farms requires a network of all-weather roads in the rural community. In Missouri, such roads exist in some areas of the state, while, in other areas, many of the rural roads become impassable during the winter months.

Notwithstanding the difficulties which may be involved, it would seem that cream producing farmers should give serious consideration to the conversion of their operations to the sale of whole milk in order to maintain their dairy enterprise on the most profitable basis in the future.

INTER-AREA ASPECTS OF THE MISSOURI DAIRY INDUSTRY

Among the inter-area aspects of importance in determining the economic position of the Missouri dairy industry are inter-area comparisons concerning the milk supply, alternative opportunities within the areas of supply; general economic factors affecting the place of dairying in the respective areas of production; and farmers' attitudes toward dairying.

Inter-Area Comparisons Concerning the Milk Supply

It seems desirable at this point to consider some of the more important inter-area aspects of the milk supply, especially to compare the differences existing in the principal areas of production. Of primary importance in this respect are the cow population and milk production.

Cow Population by Areas.—As a result of the increasing emphasis which has been placed on the dairy enterprise in Missouri, the number of dairy cows has risen substantially during the past 30 years. However, when the figures are analyzed by areas, it appears that most of the increase has occurred in Southwest Missouri* (Fig. 8). The increase in this area apparently resulted largely from the introduction of improved varieties into the pasture mixtures, which have improved materially their carrying capacity.

Neither of the fluid milk supply areas had any significant increase in the number of milk cows during the entire period from 1920 to 1950. The trend in cow population in the St. Louis supply area increased somewhat during the 1920s and early 1930s but declined during the late 1930s. Again, in the early 1940s, the trend was upward, but it declined in the late 1940s. Essentially the same situation existed in the Kansas City supply area; however, the cyclical variation there appears even more pronounced. During the entire period, the number of cows in the St. Louis supply area increased only 7 per cent, while that in the Kansas City supply area increased less than 3 per cent.

*For a more complete discussion of the dairy industry in Southwest Missouri, see Kirtley, M. B., and Erwin, C. C., *Marketing Dairy Products in Southwest Missouri*, Missouri Experiment Station Bulletin 567, Feb., 1952.

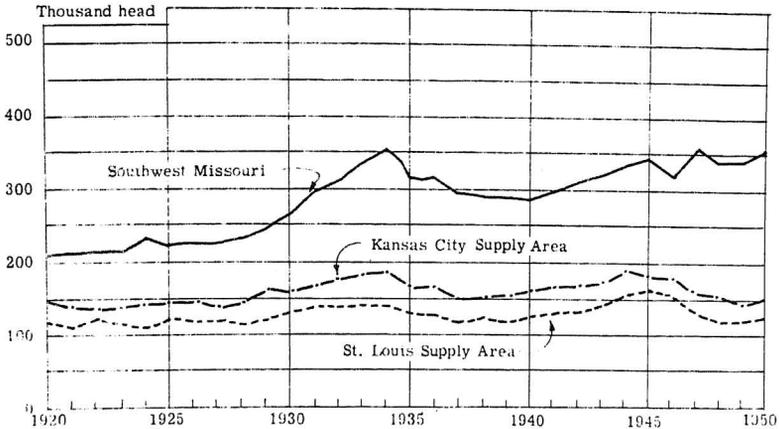


Fig. 8 -- Number of Milk Cows in Selected Areas of Missouri, 1920-1950.
(See Appendix Table VI)

In the Southwest area, while only a slight increase in milk cow numbers occurred during the early and middle 1920s, the cow population increased from 227 thousand in 1928 to 351 thousand in 1934, or 55 per cent. After declining considerably during the late 1930s, the number of milk cows in the Southwest area has increased steadily during the past decade, and, in 1950, amounted to 351 thousand, which represented 36 per cent of the total milk cow population of the state.

Variation in the number of milk cows kept on farms undoubtedly is due to a multiplicity of causes. Among the many factors that might be mentioned are: periodic scarcities of feed and pasture, resulting from adverse weather conditions, rain, drouth, and the like; tight labor situations, during which other alternatives offered greater remuneration; and divergencies in the prices of dairy products as compared to other farm products. With respect to the latter point, it is apparent that the number of cows increased significantly during the late 1920s and early 1930s, a period of adverse business conditions, during which prices of most agricultural products declined drastically. Apparently, the conversion to dairying was considerable during this period. An examination of both the butterfat-hog and the butterfat-beef cattle price ratios* indicates that farmers had sufficient economic incentive to place relatively more emphasis on dairying during these periods (Fig. 9). Furthermore, the farm family labor probably could be utilized more advantageously in the production of dairy products than in the production of other agricultural products.

*The terms "butterfat-hog ratio" and "butterfat-beef cattle ratio" indicate the number of pounds of the designated live animal that is required to be equal in value to one pound of butterfat at prevailing prices.

commercialization of dairying has progressed, it has been necessary for farmers to increase the size of their herds in order to improve their cash incomes. This has been true especially in the Southwest area, as well as in the fringes of both the St. Louis and Kansas City supply areas, where the farms are relatively small.

Milk Production by Areas.—As indicated previously, along with the general trend toward greater specialization which has been characteristic of the dairy enterprises in Missouri, milk production has increased significantly during the past quarter century. This general upward trend has been apparent for each of the major areas of production, but the most important increase took place in the Southwest area, where dairying is the primary farm enterprise on most farms (Table 4).

Table 4 -- Number of Cows Milked, Total Milk Production, and Average Production Per Cow for Selected Areas of Missouri, 1924-1944¹

| Year | Number of cows milked | Total milk production (pounds) | Production per cow (pounds) |
|--------------------------------|-----------------------|--------------------------------|-----------------------------|
| St. Louis Supply Area | | | |
| 1924 | 115,600 | 343,188,358 | 2,969 |
| 1934 | 129,908 | 383,971,914 | 2,956 |
| 1939 | 113,307 | 395,116,680 | 3,487 |
| 1944 | 111,139 | 448,311,000 | 4,034 |
| Kansas City Supply Area | | | |
| 1924 | 143,956 | 474,660,841 | 3,297 |
| 1934 | 166,865 | 523,410,216 | 3,136 |
| 1939 | 132,176 | 514,960,905 | 3,896 |
| 1944 | 132,102 | 545,415,672 | 4,129 |
| Southwest Missouri | | | |
| 1924 | 209,957 | 628,065,680 | 2,991 |
| 1934 | 322,900 | 875,812,330 | 2,712 |
| 1939 | 261,593 | 861,487,430 | 3,293 |
| 1944 | 306,128 | 1,253,646,957 | 4,095 |

¹ Data obtained from United States Census of Agriculture, by States, 1925-1945, Department of Commerce, Bureau of the Census, Washington, D. C.

According to census data, milk production in this area increased from approximately 628 million pounds in 1924 to 1,254 million pounds in 1944. This represents a net increase in the Southwest area of 99.6 per cent as compared to 30.6 per cent in St. Louis supply area and only 14.9 per cent in the Kansas City supply area.

As the number of milk cows kept on farms increased less percentage-wise than milk production, most of the increase resulted from an increase in production per cow. It should be noted that this increase took place primarily during the late 1930s and early 1940s and coincided in point of time with the emphasis placed on the development of a

pasture-livestock economy by the various agricultural programs at both the state and national levels. But perhaps the most important factor contributing to the increase in production per cow was the work done in the selection and breeding of higher producing cows. The agencies concerned with this program included various local business and civic groups, the Extension Service of the Missouri College of Agriculture and a number of dairy herd improvement associations which maintain active programs throughout the state.

Alternative Opportunities Within the Principal Areas of Supply

To a considerable extent, the emphasis placed on milk production within the principal areas of supply is determined by the alternatives available for employing the existing productive factors. Of importance in this connection are the alternative farm enterprises and the off-farm opportunities which exist in the particular area concerned. In the areas under consideration, the alternative farm enterprises consist of cash crops and livestock other than milk cows. Off-farm opportunities consist largely of employment in a variety of small manufacturing and processing establishments, which either process farm products or serve as branch plants of larger manufacturing establishments located primarily in St. Louis.

Importance of Farm Crops.—Generally, the importance of field crops for direct sale has declined during the past quarter century, while the importance of hay and pasture crops has increased (Fig. 11). In each of the areas examined, the corn acreage averaged considerably less during the 1940s than during the 1920s. However, according to material during this period. Considerable variation is apparent in the the estimates of the Extension Service, corn yields have improved wheat acreage, both generally and for each area. The greatest variation appears in the Kansas City area, but similar production cycles appear also in the St. Louis and Southwest areas. Production peaks occurred in each of the areas during the early 1920s and the late 1930s. During recent years, a general increase in wheat acreage has been evident, but no significant increase, or decrease, is apparent in the long term trend for any of the areas.

The emphasis placed on hay, particularly in the St. Louis and Southwest areas, has increased substantially since 1935. During the 1920s the hay acreage averaged from 500 to 600 thousand acres in each of the areas under consideration. However, during the early 1930s, the hay acreage declined considerably, due primarily to adverse weather

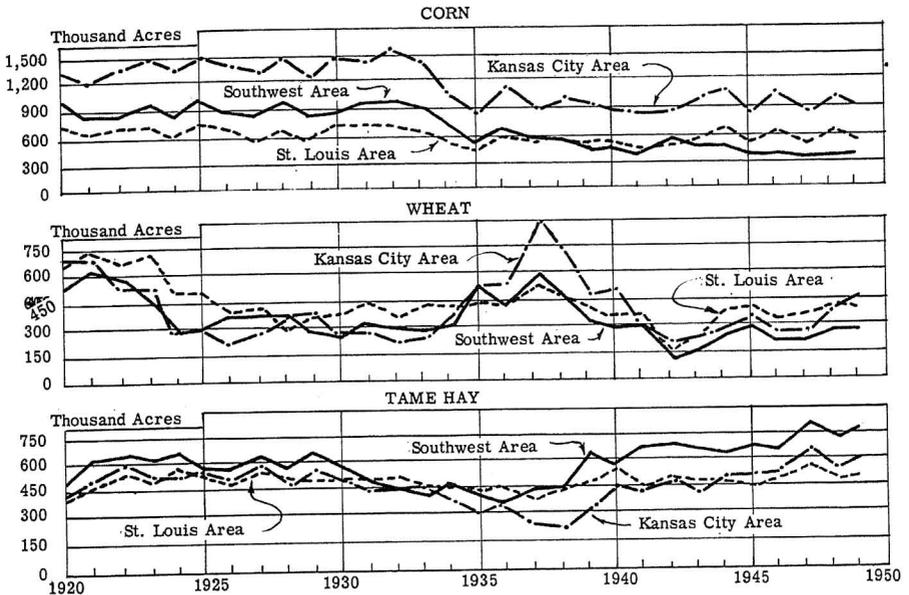


Fig. 11 -- Acreage of Corn, Wheat, and Tame Hay, Selected Areas of Missouri, 1920-1949.
(See Appendix Tables IX, X, and XI)

conditions. As a result of the introduction of improved varieties of grasses and legumes, the acreage of hay in all areas increased materially during the past decade. The Southwest area showed the greatest increase, most of which appears to have been due to the widespread use of lespedeza.

Emphasis Placed on Livestock.— As indicated already, increasingly greater emphasis has been placed on the livestock enterprises of Missouri during recent years. Among the livestock enterprises, beef cattle provides the primary competition to dairying. Since 1920, considerable variation has existed in the number of cattle other than milk cows in all three areas under consideration (Fig. 12). During the past decade, however, the general trend has been upward. As compared to the number of milk cows, the number of other cattle increased most in the Kansas City and St. Louis supply areas.

Livestock other than cattle are also of considerable importance in the principal areas of milk production. Generally speaking, hogs have been of most importance in the Kansas City area, where the feed grains are produced in more abundance than in either of the other areas (Fig. 13). Moreover, sheep have been of greatest importance in the Kansas City and Southwest areas. The extreme variation in sheep numbers in the Southwest area during the late 1920s and early 1930s may be attributed particularly to two circumstances: the promotion

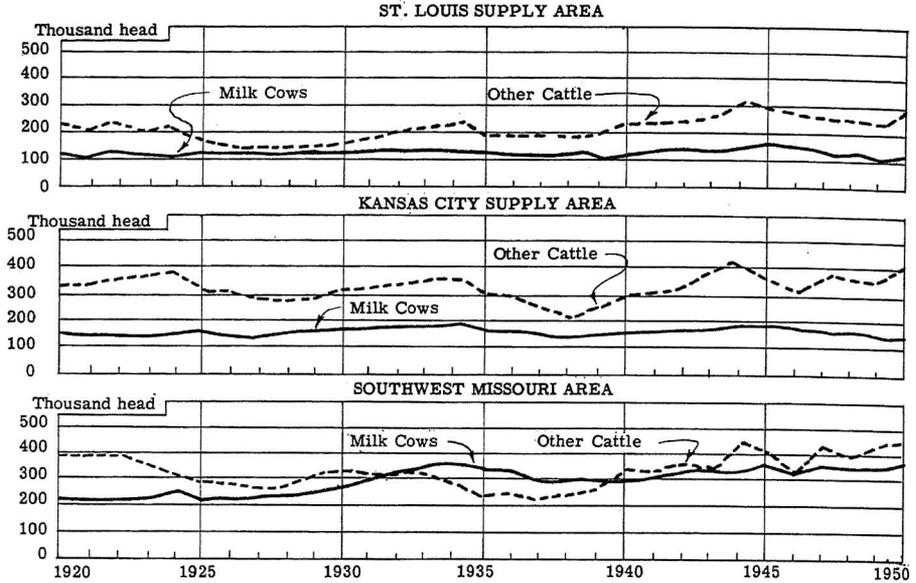


Fig. 12 -- Number of Milk Cows and Other Cattle, Selected Areas of Missouri, 1920-1950.
(See Appendix Table XII)

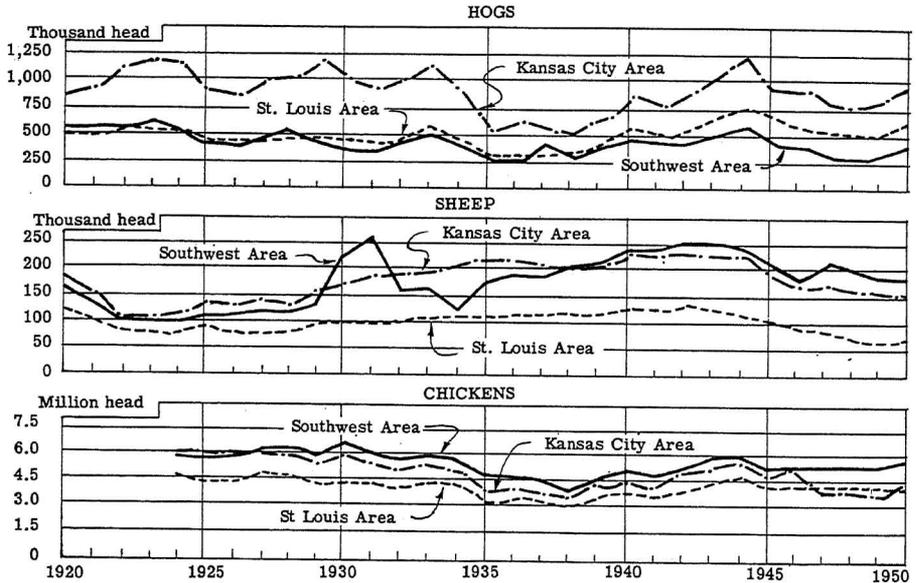


Fig. 13 -- Number of Hogs, Sheep, and Chickens, Selected Areas of Missouri, 1920-1950.
(See Appendix Tables XIII, XIV, and XV)

of sheep as a supplementary enterprise on much of the semi-range pasture and later to the shortage of pasture and roughage brought about by unfavorable weather conditions. Also, the trend in chicken numbers apparently has not changed greatly during the past quarter century, except for a brief period during the middle 1930s when the poultry enterprise decreased considerably in each of the three areas under consideration. During the past decade, more emphasis has been placed on the production of broilers and turkeys, both of which are very highly specialized enterprises, and less emphasis on the general farm flock.

The foregoing changes in farm enterprise relationships indicate that during recent years Missouri farmers have placed increasingly greater emphasis on livestock. In line with this development, the relative importance of hay and pasture crops has increased while that of cash crops has decreased. Moreover, in both the St. Louis and Kansas City fluid milk supply areas, the beef cattle enterprise is of greater importance than the dairy enterprise. Thus, the dairy enterprise must be maintained on a highly specialized basis to compete favorably with the beef cattle enterprise. Although the beef enterprise ranks second in importance in the Southwest area, it provides the primary competition to dairying, especially on the larger farms where the utilization of pasture and roughage is a primary consideration.

Off-Farm Opportunities.—The alternatives offered by off-farm employment doubtless determine to some extent the emphasis placed on farm enterprises, including that placed on dairying. Although the dairy enterprise offers timely and regular returns, it is considered too confining by many farmers. Moreover, much of the labor connected with the dairy enterprise still has to be done by hand, except on the highly specialized dairy farms which require a large expenditure of capital over a long period of time. In other words, the dairy enterprise does not lend itself to mechanization as readily as many other enterprises.

In areas, such as Southwest Missouri, where the rural population is relatively isolated from the great industrial centers, such as St. Louis, which provide the best opportunities for unskilled labor, there may seem little else for farmers to do except to employ to the fullest extent possible the existing productive factors, chiefly labor. Furthermore, off-farm opportunities may not be considered seriously primarily because they would require a break in the mode of family living. But, in such sections as the St. Louis supply area, it would seem that off-farm opportunities are taken into account, especially since many branch plants of the larger manufacturing concerns are located throughout the area.

In an effort to arrive at some measure of the extent and influence of off-farm alternatives available to rural residents in the St. Louis supply area, the number of manufacturing firms was recorded and classified according to products (Table 5). In the primary area of the St. Louis milkshed, 92 firms were recorded. Of these, lumber processing

Table 5 -- Manufacturing Firms in the St. Louis Supply Area Classified According to Products¹

| Type of Firms | Number of firms in Primary area of supply ² | Number of firms in Secondary area of supply ³ |
|---|--|--|
| Brewery, winery, distillery | 4 | 1 |
| Cannery | 1 | -- |
| Concrete fabrication and ceramics | 12 | 10 |
| Creamery and milk products (excluding Grade A milk, ice cream, and cottage cheese) | 3 | 6 |
| Foundry | -- | 5 |
| Industrial equipment and miscellaneous | 19 | 13 |
| Leather | 12 | 23 |
| Limestone, barite, brick, and monument | 6 | 22 |
| Lumber, building materials, furniture, and wood products | 20 | 41 |
| Milling | 4 | 10 |
| Packing | -- | 4 |
| Pipes (corn cob and hickory) | 3 | 1 |
| Textiles, clothing, and mattress | 8 | 17 |
| Total establishments reported | 92 | 153 |

¹ Missouri Directory of Manufactures, 1950, Missouri Department of Resources and Development, Jefferson City, Missouri.

² Includes following counties: Franklin, Jefferson, St. Charles, St. Louis but excludes City of St. Louis.

³ Includes following counties: Cape Girardeau, Crawford, Gasconade, Lincoln, Maries, Marion, Montgomery, Osage, Perry, Pike, Ralls, St. Francois, Ste. Genevieve, Warren, Washington.

and industrial equipment were of prime importance, while leather processing and concrete fabrication ranked second. In the secondary area of supply, 153 firms were recorded. Although these establishments engaged in a wide variety of activities, the processing of lumber led the list, with limestone and related products of secondary importance. In both areas, it appears that these off-farm opportunities provide considerable competition for the supply of farm labor.

General Economic Factors Affecting the Place of Dairying

In the preceding section, some of the alternatives available to dairy farmers in the principal areas of supply were discussed. These

included the importance of farm crops, the emphasis placed on livestock other than dairy cows, and off-farm opportunities. Doubtless many other factors affect the place of dairying in the principal areas of milk production. Among other things, the place of dairying in Missouri generally, as well as in each of the principal areas of supply, would seem to depend to a large extent upon the size of farms, certain commodity-price ratios, and the balance of pasture.

Average Size of Farms.— Perhaps one of the most important factors affecting the place of dairying in any particular area as a whole is the average size of farms. In the St. Louis supply area, the average size of farms exceeded that of the state as a whole (Fig. 14). During the

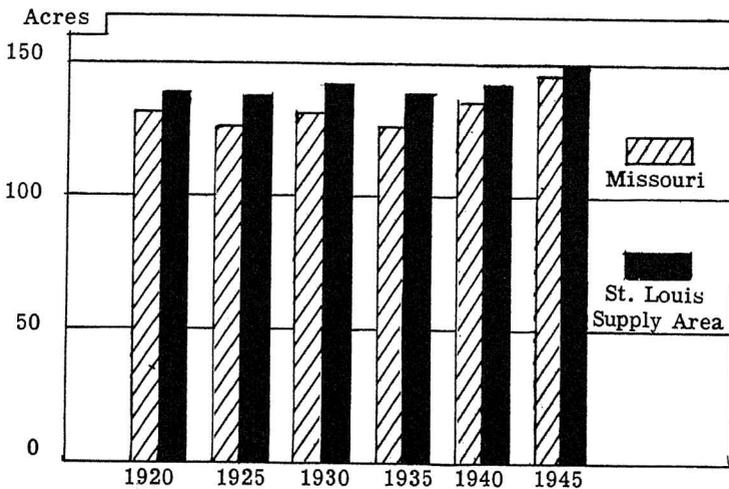


Fig. 14 -- Average size of Farms in Missouri and the St. Louis Milk Supply Area, 1920-1945.
(See Appendix Table XVI)

1920s and 1930s, the average size of farms in this area remained relatively more stable than that of the state. During most of the period, farms averaged approximately 140 acres, increasing to almost 150 acres in 1945. However, in the Kansas City supply area, the average size of farms approximated that of the state, increasing from approximately 125 acres during the 1920s and 1930s to almost 150 acres in 1945 (Fig. 15). Thus, farm size in the Kansas City area, the average somewhat less than that of the St. Louis area and it may be noted that a higher percentage of fluid milk is produced in this area than in the St. Louis area.

The size of farms averaged less in the Southwest area than either of the fluid milk supply areas. From 1925 to 1935, farms averaged

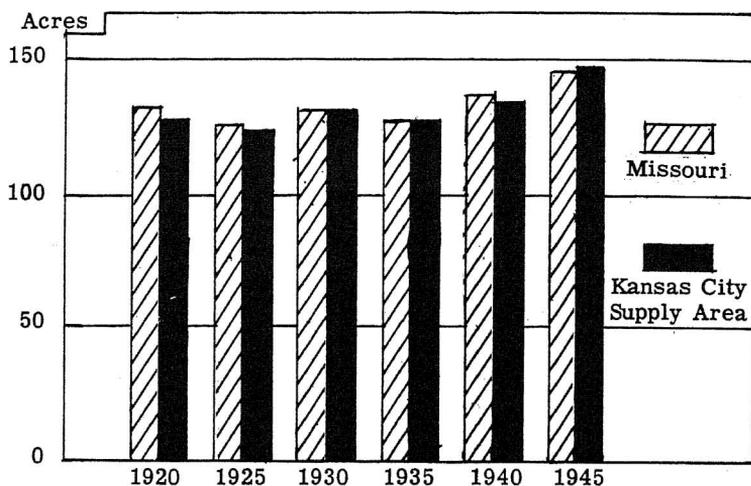


Fig. 15 -- Average Size of Farms in Missouri and the Kansas City Milk Supply Area, 1920-1945.
(See Appendix Table XVI)

approximately 115 acres in size, or about 15 per cent less than that of the St. Louis area. Actually, these figures appear high, for many of the farms in the area contain a small acreage of cropland which explains in part why so much emphasis is placed on dairying (Fig. 16).

Commodity-Price Ratios.—As indicated already, the long term butterfat-beef cattle price ratio was more favorable to dairy farmers during the period of the 1920s than it has been since. From 1920 to 1925, between six and seven pounds of beef (live-weight) were required to be worth a pound of butterfat on the market. Since the early 1930s, however, beef has gained steadily on the average as compared to dairying, measured in terms of the price of butterfat. Likewise, the butterfat-hog price ratio shows essentially the same relationship as the butterfat-beef cattle ratio, except that during the 1920s the cyclical variation was less pronounced. Furthermore, an examination of the milk-hog and milk-beef cattle price ratios indicates a general decline (Table 6). But these appear to be only phases of cyclical variation, and therefore cannot be expected to continue at present levels.

The long term relationships in both the butterfat-feed and the milk-feed price ratios show considerable variation (Fig. 17). Generally, these ratios were lowest during the period from 1910 to 1920, and highest, in 1921, 1926, and 1946. During recent years, these dairy product-feed ratios have been unfavorable to dairy production, but there is considerable evidence at present that these ratios may soon become more favorable.

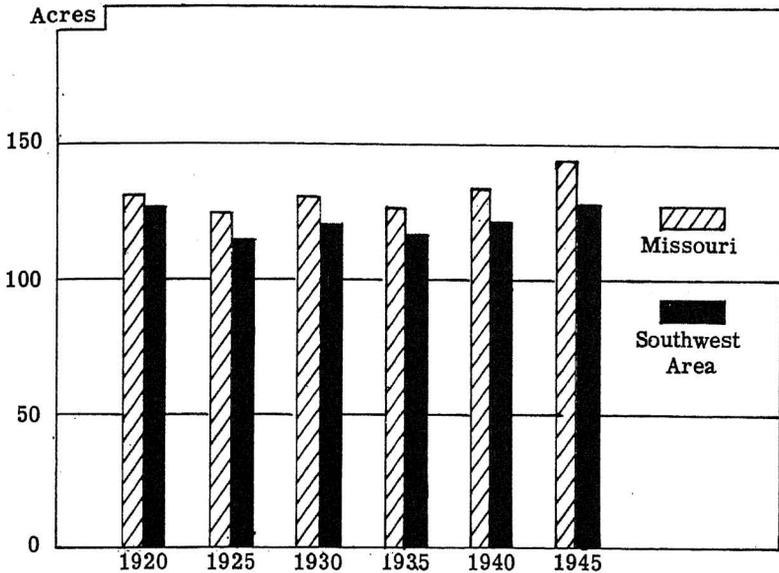


Fig. 16 -- Average Size of Farms in Missouri and the Southwest Area, 1920-1945. (See Appendix Table XVI)

Table 6 -- Milk-Hog and Milk-Beef Cattle Price Ratios for the North Central States 1940-1950¹

| Year | Milk-hog Ratio ² | Milk-beef Cattle Ratio ² |
|------|-----------------------------|-------------------------------------|
| 1940 | .30 | .20 |
| 1941 | .22 | .21 |
| 1942 | .18 | .20 |
| 1943 | .20 | .22 |
| 1944 | .22 | .26 |
| 1945 | .20 | .22 |
| 1946 | .20 | .24 |
| 1947 | .16 | .20 |
| 1948 | .19 | .19 |
| 1949 | .18 | .16 |
| 1950 | .18 | .14 |

¹ Dairy Situation, United States Department of Agriculture, Bureau of Agricultural Economics, October, 1950, p. 14.

² Number of pounds of live animal required to equal the value of one pound of milk.

The Balance of Pasture.— Another factor which determines to some extent at least the choice of the livestock enterprise is the balance of pasture. In areas where the percentage of pasture is relatively high, beef cattle and sheep usually are given priority; whereas, in areas where

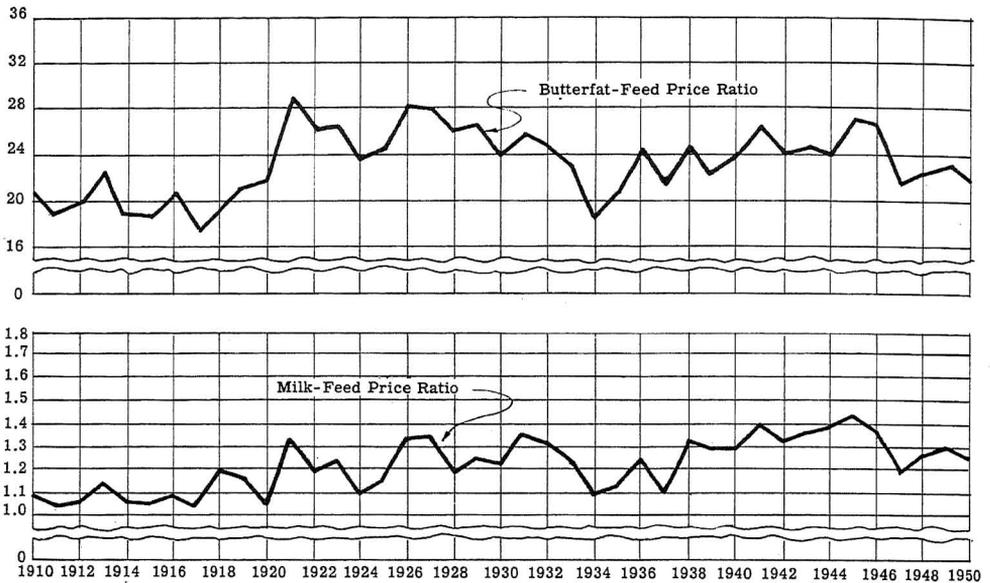


Fig. 17 -- Selected Commodity-Feed Price Ratios Affecting the Dairy Industry, 1910-1950.(See Appendix Table XVII)

the percentage of pasture is relatively low, dairy cattle are better adapted.

As compared to the total land area, the percentage of pasture in 1950 was highest in the Kansas City supply area and lowest in the St. Louis supply area, both in the primary and in the secondary areas of supply (Table 7). In the St. Louis primary area of supply, only 15 per cent of the total land area was in pasture; whereas, in the Kansas City

Table 7 -- Pasture Percentages of Selected Areas of Missouri, 1950¹

| | Per Cent pasture was of total land area | Per Cent pasture was of land in farms | Per Cent pasture was of total cropland |
|------------------|--|--|---|
| St. Louis Area | 18.26 | 24.95 | 50.12 |
| Primary area | 14.61 | 22.28 | 40.44 |
| Secondary area | 19.42 | 25.69 | 53.16 |
| Kansas City Area | 31.20 | 35.26 | 59.78 |
| Primary area | 32.91 | 38.34 | 67.76 |
| Secondary area | 30.69 | 34.39 | 57.63 |
| Southwest Area | 26.70 | 34.09 | 78.15 |

¹ Computed from data obtained from the United States Census of Agriculture, 1950, Department of Commerce, Bureau of the Census, Washington, D. C.

primary area of supply, 33 per cent was in pasture. This difference may be accounted for primarily by the fact that a much larger percentage of the land area in the St. Louis primary area is suburban than in the Kansas City primary supply area. In the secondary areas, the percentage of pasture increased in the St. Louis area as compared to that of the Kansas City area. When the area in pasture was compared to the total land in farms and to the total cropland, approximately the same differences were found to exist.

As compared to the total land area, the balance of pasture was greater in the Southwest area than in the St. Louis area but less than in the Kansas City area. However, as compared to the cropland, the percentage of pasture was considerably greater in the Southwest area than in either of the other areas. This explains to a considerable extent the greater emphasis which is placed on dairying in the Southwest area.

Farmers' Attitudes Toward Dairying

Dairying receives less emphasis in the St. Louis supply area than in either of the other areas under consideration. As indicated previously, this area extends over a vast territory of the state, but in much of this territory dairying is a minor, if not insignificant, enterprise. Therefore, in an attempt to determine some of the obstacles to the expansion of fluid milk production, a survey was conducted in five counties of the area and interview schedules were taken from 47 farmers selected at random. Of the 47 farmers included in the sample, 15 produced and marketed Grade A milk, one marketed ungraded whole milk, and eight marketed farm separated cream (Table 8). Five farms were reported on which no cows were kept.

The most frequently mentioned comment relative to the obstacles to the expansion of milk production concerned a labor shortage. Probably the most significant implications in this comment were the relative shortage of competent labor and the competing alternatives available in other lines to workers than employed on dairy farms. Next in importance was the dislike of dairy farm inspections relative to sanitation, and, more particularly, structural requirements for milking parlors. In this connection, it should be noted that several farmers mentioned the inconsistent interpretations made by health inspectors concerning market requirements (Table 9).

The high cost of entering the dairy business, poor markets, and greater profits in other enterprises were considered equally important as obstacles to the expansion of milk production. Together, these might be considered as indicative of the relative competitive current position of the dairy enterprise. Currently, other enterprises available to farmers in this area offer more profitable utilization of the production factors. If long run considerations had been implied in the questions,

Table 8 -- Number of Cows and Disposition of Milk Production Reported on 47 Farms Selected at Random in Five Counties of the St. Louis Supply Area, 1952.

| Item | Counties | | | | |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
| | Audrain | Randolph | Franklin | Phelps | Lincoln |
| Total No. of Farms | 10 | 9 | 10 | 9 | 9 |
| No. of Farms with: | | | | | |
| 0 cows | 2 | - | 1 | - | 2 |
| 0-5 cows | 7 | 5 | 5 | 5 | 6 |
| 6-10 cows | - | - | - | - | - |
| 11-15 cows | - | 1 | - | 2 | - |
| Over 15 cows | 1 ¹ | 3 ² | 4 ³ | 2 ⁴ | 1 ⁵ |
| No. of farms selling: | | | | | |
| Grade A Milk | 1 | 4 | 4 | 5 | 1 |
| Whole Milk (not Grade A) | - | - | - | - | 1 |
| Farm separated cream | 1 | - | 2 | 4 | 1 |

¹ This farm maintained an 18 cow herd.

² One of these farms maintained an 18 cow herd; One a 24-cow herd; and the other a 34-cow herd.

³ One of these farms maintained a 25-cow herd; two, a 30-cow herd; and one, an 86-cow herd.

⁴ One of these farms maintained a 20-cow herd; the other, a 25-cow herd.

⁵ This farm maintained a 25-cow herd.

Table 9 -- Attitudes of Farmers as to the Obstacles to the Expansion of Milk Production in Selected Counties of the St. Louis Supply Area.

| Obstacles to the Expansion of Milk Production | Number of Respondents in: | | | | | Total for all counties |
|---|---------------------------|-----------------|----------------|-----------------|---------------|------------------------|
| | Audrain county | Randolph county | Lincoln county | Franklin county | Phelps county | |
| Poor Roads | 1 | - | 2 | - | - | 3 |
| Labor Shortage | 3 | 2 | 6 | 8 | 6 | 25 |
| Dairying too Confining | 4 | 1 | - | 1 | - | 6 |
| Dairy Margin Low | 1 | - | - | 1 | 2 | 4 |
| High cost of entering Dairy Business | 1 | 1 | 1 | 1 | 1 | 5 |
| Dislike of Dairy Inspectors | 1 | - | 3 | 2 | 1 | 7 |
| Poor Market Outlets | - | 5 | - | - | - | 5 |
| Poor Pastures | - | - | - | 2 | - | 2 |
| Small Farms | - | - | - | 2 | - | 2 |
| Low Grade Cows | - | - | - | 1 | - | 1 |
| Greater Profits in Other Enterprises Particularly | | | | | | |
| Livestock and Grain | 3 | 1 | 1 | - | - | 5 |
| No obstacles | 2 | - | - | - | 1 | 3 |
| Don't Know, no answer | 1 | 1 | 2 | - | - | 4 |
| Total Number of Respondents | 17 | 11 | 15 | 18 | 11 | 72 |

¹ Data obtained by Survey, May, 1952, Department of Agricultural Economics, University of Missouri College of Agriculture, Columbia, Missouri.

these comments undoubtedly would have been less important. Other comments, less frequently mentioned, such as poor roads, small size of farms, and poor pastures, were generally indicative of the individual farm situation. Only three farmers reported that in their opinion there were no obstacles to the expansion of milk production.

UTILIZATION OF THE MISSOURI MILK PRODUCTION

With the growth of the Missouri dairy industry during the past quarter century, marked changes have occurred in the pattern of utilization of the milk supply. The most significant changes have been the declining trend in the percentage of the total production utilized in the manufacture of creamery butter and the upward trend in the percentage used in various types of fluid milk products. Perhaps attention should be given first to the general trends in the utilization of milk for the state as a whole, and then consider the problem in more detail by areas.

Utilization of Milk in the Principal Dairy Products

Although the available data relative to utilization of Missouri milk do not allow either for shipments of milk into and out of the state or for duplication in the production of different dairy products, an attempt has been made to arrive at an approximation by converting the reported production of the principal dairy products into milk equivalents and presenting these as percentages of the total reported farm production (Fig. 18). In selecting the particular dairy products for this estimation, an attempt also was made to minimize the duplication involved by choosing only those products which utilize the major part of the farm product. Therefore, it is believed that these trends in utilization may be considered fairly reliable.

Utilization Trends From 1925 to 1938.—From 1925 to 1938, the general trend in the percentage of the total milk production utilized in the manufacture of creamery butter increased. Likewise the percentage utilized in the production of cheese and évaporated milk increased considerably, while that used in the production of ice cream, although showing some variation, remained relatively stable. It must be noted, however, that this general trend was interrupted during the early 1930s by the depression, and, for two or three years, considerably less milk was utilized in the manufacture of almost all types of dairy products.

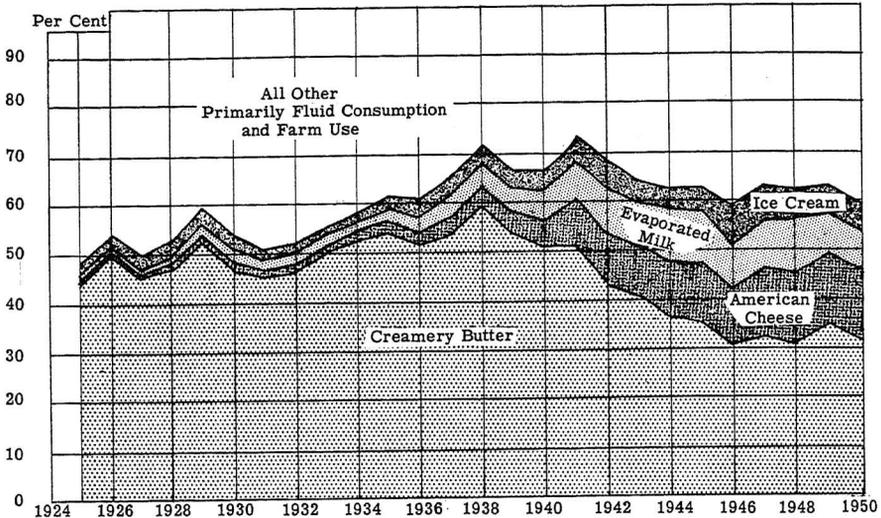


Fig. 18 -- Utilization of Milk in the Principal Dairy Products, Missouri, 1925-1950.
(See Appendix Table XVIII)

Utilization Trends From 1938 to 1950.— Since 1938, the pattern of utilization of Missouri milk has changed greatly. In this connection, the proportion of the total production utilized in creamery butter production declined from almost 60 per cent of the total farm production in 1938 to about 30 per cent in 1946. During more recent years, however, the percentage of the total utilized in butter has leveled off at about 33 per cent. On the other hand, the percentage utilization of milk in the production of the other major products, with some exceptions, has steadily increased. The most important gain has been made by American cheese, which increased consistently in the percentage utilization of the total farm supply from only 1 per cent in 1932 to more than 14 per cent in 1950. During the past decade, the increasing requirements of cheese have offset to a great extent the declining percentage requirements of creamery butter. The percentage increase in the production of cheese shows little evidence of leveling off and, therefore, it may be expected to increase still further during the present decade.

Important gains also have been made by evaporated milk and ice cream, as well as some of the minor manufactured dairy products. The percentage utilization of evaporated milk increased from 4.6 per cent in 1938 to 10.5 per cent in 1945. However, during more recent years, the percentage utilized by evaporated milk seems to have become stabilized at around 8 per cent of the total farm production. About the same situation has existed for ice cream, the production of which ac-

counted for 3.6 per cent of the total utilization in 1938 and 5.5 per cent in 1950.

Likewise, Missouri has become an important producer of such minor dairy products as nonfat dry milk solids for human consumption, cottage cheese, sherbet, and fluid cream, which have been produced primarily in connection with the manufacture of other staple dairy products (Table 10). The production of nonfat dry milk solids for

Table 10 -- Production of Certain Minor Dairy Products, Missouri, 1935-1950¹

| Year | Nonfat Dry Milk Solids (for human consumption) (1000 lb.) | Dry Skim Milk (ani- mal feed) (1000 lb.) | Cottage Cheese (1000 lb.) | Sherbet (1000 gal.) |
|------|---|---|---------------------------------|------------------------|
| 1935 | 4,136 | 3,608 | 3,572 | 110 |
| 1936 | 6,152 | 3,527 | 3,931 | 157 |
| 1937 | 9,341 | 4,766 | 4,131 | 126 |
| 1938 | 12,380 | 5,807 | 4,054 | 176 |
| 1939 | 10,210 | 3,408 | 4,775 | 163 |
| 1940 | 12,053 | 2,967 | 5,048 | 271 |
| 1941 | 16,691 | 1,633 | 5,103 | 173 |
| 1942 | 17,467 | 1,636 | 6,137 | 166 |
| 1943 | 16,215 | 573 | 5,742 | 1,311 |
| 1944 | 20,802 | 1,287 | 6,481 | 992 |
| 1945 | 21,560 | 1,408 | 7,779 | 2,180 |
| 1946 | 24,974 ² | 1,220 | 6,349 ² | 474 |
| 1947 | 27,848 | 1,952 | 6,999 | 339 |
| 1948 | 29,968 | 625 | 7,322 | 320 |
| 1949 | 37,977 | 534 | 7,768 | 362 |
| 1950 | 32,485 | 786 | 9,913 | 501 |

¹ Production of Manufactured Dairy Products, 1950, United States Department of Agriculture, Bureau of Agricultural Economics, Statistical Bulletin 105, October, 1951.

² Data reported since 1945 are not strictly comparable to previous years because of minor duplications.

human consumption increased from 4.1 million pounds in 1935 to 32.5 million pounds in 1950. At the same time, the production of dry skim milk for animal feed has decreased from 3.6 million pounds to only 0.7 million pounds. While the shift from the manufacture of animal feed to products for human consumption accounts for only a small percentage of the increase in the production of nonfat dry milk solids, it represents a significant trend in the utilization of milk solids-not-fat.

In addition, the production of other minor dairy products in Missouri has increased materially during the past 15 years. The production of cottage cheese increased from 3.6 million pounds in 1935 to 9.9 million pounds in 1950. Also, the production of sherbet increased from

110 thousand gallons in 1935 to more than two million gallons in 1945, but had declined to only 501 thousand in 1950. Furthermore, during recent years, Missouri has become an important producer of sweet cream for sale primarily in the metropolitan markets of the East Coast.

The remainder of the total Missouri farm supply of milk during the period in question has been used on farms or utilized in the fluid trade. During recent years, around 20 per cent of the total production has been utilized on farms. Depending upon the duplication involved in the production of the minor products, this leaves about 15 to 20 per cent of the total production for utilization in the various fluid milk products, of which the primary portion undoubtedly was fluid milk for immediate consumption in the cities and villages of the state.

These trends indicate that during recent years dairy manufacturing agencies in Missouri have performed an outstanding service to farmers and consumers alike by utilizing an increasingly greater percentage of the milk solids-not-fat in the production of various dairy products for human consumption.

Trends in the Overall Utilization of Milk

Thus far, it has been pointed out that in Missouri generally there has been a considerable shift in the utilization of milk, particularly during the past decade. The most marked changes have been the utilization of an increasingly larger amount of milk in the production of cheese, evaporated milk, ice cream, and nonfat dry milk solids and a corresponding decrease in the production of butter.

The foregoing trends are indicative of a fundamental change that is taking place in the consumption of dairy products, that is, the increase in the consumption of milk solids-not-fat. In this respect, reliable data relating to the production and consumption of the two major components of milk are available only for the United States as a whole. Although it would seem from the material on utilization presented in the preceding sections that Missouri plants have done a better than average job of utilizing the milk solids-not-fat, at least the overall data should be considered indicative of the trends which have taken place in Missouri.

While the total production of milk has increased materially during the past quarter century, annual production per capita has remained relatively stable at about 105 pounds of total milk solids (Table 11). This figure increased temporarily during the war period, reaching 116.5 pounds in 1942. Furthermore, a little change in the percentage of the total production of milk fat utilized for human consumption occurred during this period. However, a significant change occurred in the utilization of the nonfat component. The percentage of the total production of milk solids-not-fat utilized for human consumption rose

Table 11 -- Production and Utilization of Milk in the United States, 1924-1950¹

| Year | Total milk production | | Production per capita | | Percentage of total production utilized for human consumption | |
|------|------------------------------|----------------|-----------------------|----------------|---|----------------|
| | Milk fat (Million pounds) | Solids-not-fat | Milk fat (Pounds) | Solids-not-fat | Milk fat (Per cent) | Solids-not-fat |
| 1924 | 3,671 | 8,429 | 31.9 | 73.4 | 97.1 | 51.8 |
| 1925 | 3,722 | 8,545 | 31.9 | 73.3 | 97.1 | 51.8 |
| 1926 | 3,818 | 8,766 | 32.3 | 74.2 | 97.1 | 51.8 |
| 1927 | 3,882 | 8,912 | 32.4 | 74.4 | 97.1 | 51.1 |
| 1928 | 3,905 | 8,943 | 32.2 | 73.7 | 97.0 | 52.0 |
| 1929 | 4,004 | 9,192 | 32.7 | 75.0 | 97.1 | 53.0 |
| 1930 | 4,037 | 9,269 | 32.6 | 74.9 | 97.1 | 52.7 |
| 1931 | 4,160 | 9,527 | 33.3 | 76.3 | 97.2 | 50.8 |
| 1932 | 4,191 | 9,597 | 33.4 | 76.4 | 97.3 | 51.4 |
| 1933 | 4,228 | 9,683 | 33.5 | 76.7 | 97.3 | 51.7 |
| 1934 | 4,115 | 9,400 | 32.4 | 74.0 | 97.4 | 52.3 |
| 1935 | 4,109 | 9,363 | 32.1 | 73.1 | 97.4 | 53.6 |
| 1936 | 4,157 | 9,471 | 32.2 | 73.5 | 97.4 | 55.0 |
| 1937 | 4,137 | 9,426 | 31.9 | 72.7 | 97.4 | 55.6 |
| 1938 | 4,291 | 9,777 | 32.8 | 74.8 | 97.4 | 51.1 |
| 1939 | 4,330 | 9,866 | 32.9 | 74.9 | 97.3 | 55.3 |
| 1940 | 4,459 | 10,110 | 33.6 | 76.1 | 97.3 | 55.7 |
| 1941 | 4,688 | 10,628 | 35.0 | 79.3 | 97.4 | 57.5 |
| 1942 | 4,832 | 10,954 | 35.7 | 80.8 | 97.3 | 61.0 |
| 1943 | 4,800 | 10,855 | 34.9 | 79.0 | 97.3 | 63.4 |
| 1944 | 4,809 | 10,874 | 34.6 | 78.3 | 97.3 | 66.6 |
| 1945 | 4,948 | 11,190 | 35.2 | 79.7 | 97.3 | 66.6 |
| 1946 | 4,877 | 11,029 | 34.3 | 77.6 | 97.3 | 70.6 |
| 1947 | 4,851 | 10,970 | 33.5 | 75.7 | 97.4 | 69.4 |
| 1948 | 4,710 | 10,652 | 32.0 | 72.3 | 97.4 | 70.7 |
| 1949 | 4,834 | 10,986 | 32.2 | 73.2 | 97.4 | 69.9 |
| 1950 | 4,886 | 11,104 | 32.0 | 72.8 | 97.3 | 69.3 |

¹ Data obtained from Dairy Statistics and Related Series, United States Department of Agriculture, Bureau of Agricultural Economics, Statistical Bulletin No. 100, June, 1951, pp. 71-72.

from 51.8 per cent in 1924 to 70.7 per cent in 1948, which represents a net increase of approximately 34 per cent. In 1950, this percentage had dropped only to 69.3 per cent.

Obviously, this increase in the percentage of total milk solids-not-fat production used for human consumption displaced other uses, chief among which was that used for livestock feed. Disposition figures cited in a previous section, indicated that the percentage of milk fed or consumed on farms declined from 40 per cent of the total production in 1924 to less than 20 per cent in 1950. Although the percentage consumed by farm families may have decreased somewhat, it appears that the percentage fed to livestock and wasted has decreased much more.

In support of this generalization, it should be pointed out that during the same period the percentage sold as whole milk to dairy plants increased from less than 10 per cent of the Missouri production to approximately 60 per cent. Furthermore, the manufacture of nonfat dry milk solids in Missouri has expanded greatly during recent years. Production of nonfat dry milk solids for human consumption has increased from about 10 million pounds in 1939 to 38 million pounds in 1949. This almost four-fold increase in the importance of the nonfat solids was brought about largely in connection with other manufacturing operations, and, therefore, represents a significant additional contribution to the dairy industry of Missouri. Although outstanding advances have been made by the Missouri dairy industry in the utilization of milk solids-not-fat into various products for human consumption, there remains a considerable stock for potential use. The utilization of a greater percentage of the solids-not-fat, therefore, is the most important future problem of the dairy industry.

Greater quantities of the solids-not-fat component may be utilized by increasing the production and sale of fluid milk, cheese, evaporated and condensed milk, and dry whole milk, all of which use the milk solids-not-fat as well as the fat solids. But the greatest possibilities for increased utilization of the solids-not-fat component lie in the expansion of the market outlets for the nonfat dry milk solids. In this connection, it should be recognized that the filled milk products, including both the high and low fat products, represent an increased utilization of the solids-not-fat component.

At current prices, nonfat dry milk solids for human consumption offer approximately a three-fold more profitable outlet than dry skim milk for animal feeds. Since approximately 30 per cent of the solids-not-fat throughout the industry is at present fed or wasted, this represents a sizable potential increment to the dairy income.

It would seem from the data on utilization presented in a preceding section that only about 18 per cent of the solids-not-fat component in Missouri is currently available for manufacture into human food, as approximately 82 per cent of the total milk production is utilized in some form of fluid milk or manufactured dairy products. As a result, Missouri farmers receive a greater income from their total milk production than the average farmer in the United States.

Missouri's National Rank in Various Phases of the Dairy Industry

Not only has the dairy enterprise in Missouri gained in importance relative to other farm enterprises, but also it has gained in national

rank (Table 12). With 939,000 cows, Missouri ranked ninth in number of milk cows on farms in 1950. Since 1925, Missouri has increased its rank in total milk production from thirteenth to tenth place among the leading dairy states of the nation. Moreover, in the production of creamery butter, Missouri has risen in rank from ninth place in 1925 to fifth in 1950. That this increase has occurred in spite of declining sales of farm separated cream indicates the increasing importance of the utilization of solids-not-fat in the butter manufacturing industry. While its rank in ice cream production has remained about the same during the past quarter century, Missouri has moved from sixteenth to sixth place in the production of evaporated milk.

Table 12 -- Rank of Missouri in Various Phases of the Dairy Industry of the Nation, 1925-1950¹

| ITEM | | 1925 | 1930 | 1935 | 1940 | 1945 | 1950 |
|-----------------|---------|--------|--------|--------|--------|---------|---------|
| Cows Milked | Rank | 9 | 7 | 8 | 9 | 9 | 9 |
| Thousand | Head | 811 | 928 | 989 | 903 | 1,025 | 939 |
| Milk Produced | Rank | 13 | 11 | 11 | 11 | 11 | 10 |
| Million | Pounds | 2,676 | 3,472 | 3,363 | 3,386 | 4,192 | 4,423 |
| Milk Per Cow | Rank | 37 | 34 | 32 | 38 | 33 | 32 |
| | Pounds | 3,300 | 3,700 | 3,460 | 3,750 | 4,090 | 4,710 |
| Creamery Butter | Rank | 9 | 6 | 4 | 6 | 5 | 5 |
| Thousand | Pounds | 55,953 | 77,939 | 87,438 | 82,924 | 71,412 | 66,329 |
| American Cheese | Rank | 18 | 10 | 11 | 6 | 3 | 2 |
| Thousand | Pounds | 252 | 3,248 | 8,185 | 19,306 | 49,906 | 63,736 |
| Evaporated Milk | Rank | 16 | 11 | 12 | 7 | 6 | 6 |
| Thousand | Pounds | 10,109 | 40,444 | 35,177 | 92,605 | 200,689 | 161,412 |
| Ice Cream | Rank | 11 | 10 | 10 | 11 | 10 | 10 |
| | Gallons | 5,890 | 6,624 | 5,485 | 8,793 | 13,078 | 16,245 |

¹ Farm Production, Disposition, and Income from Milk, United States Department of Agriculture, Bureau of Agricultural Economics; Production of Manufactured Dairy Products, United States Department of Agriculture, Bureau of Agricultural Economics; and related series obtained from the Office of the State Statistician.

But the most important gain of Missouri in the dairy industry of the nation has been its relative increase in rank with respect to cheese production. In 1925, Missouri produced only 250,000 pounds of cheese and ranked eighteenth among the states. Whereas, in 1950, Missouri produced 63,476,000 pounds and ranked second among the states in cheese production, exceeded only by Wisconsin. Although cheese production in Missouri was increasing previously, the war period further stimulated this trend. Thus, Missouri's production of only about 19 million pounds of cheese in 1940 had increased to approximately 64 million pounds in 1950. During the same period, the production of creamery butter dropped from 83,000,000 pounds to 66,000,000 pounds, which resulted partly from the change in disposition of the farm supply

from cream to whole milk and partly from the fact that the production of butter had increasingly become a by-product of other more remunerative dairy manufacturing operations. However, the increase in the production of cheese approximately compensated for the decrease in the production of creamery butter. If the demand for dairy products which require a higher per cent of the total milk solids continues to increase, this substitution may be expected to continue.

In this outstanding development, the influence of the new forage crop, lespedeza, for pasture and hay and a vigorous educational program centering on land improvement and balanced farming were of fundamental importance. Also, the energetic and business-like fashion in which various interests have developed a system of modern dairy plants to utilize the increased production and convert it into the products which the market wanted have been noteworthy.

Since the population is growing and using increasing quantities of dairy products, future possibilities for further expansion seem likely. Increased output probably will come from higher production per cow as educational programs teach more farmers better methods and as the quality of the dairy herd is raised by an active program of breeding up better producing stock. A modernization of procurement methods and manufacturing facilities in the old butterfat producing area of Northern Missouri also contribute to expansion. Such developments will emphasize the utilization of both butterfat and solids-not-fat in line with recent trends in the industry.

SUMMARY

Dairying has made an important contribution to the economic progress of Missouri agriculture. With generally favorable climatic conditions and a considerable amount of land suited best to pasture and forage production, farmers have depended largely upon livestock enterprises for their cash income. The comparatively greater emphasis placed on dairying in the Southwest area appears to have been due to the fact that dairying has afforded an intensive farm enterprise, which utilized most efficiently the pasture production on the relatively small farms, and provided also the most profitable employment of the farm family labor.

The results of this study may be summarized as follows:

1. During the past quarter century, the sale of dairy products has constituted from 8 to 14 per cent of total cash farm income in Missouri. An additional contribution was provided by the sale of calves and cull cows. Thus, during recent years, it appears that almost one fifth of the

total Missouri cash farm income may be attributed either directly or indirectly to dairying.

2. The expansion of dairying in Missouri has been almost continuous for many years. Milk cow numbers have increased from 800,000 head in 1920 to approximately 1,000,000 head in 1950. During a similar period, milk production has increased by about one fourth.

3. Along with the development of dairying, important changes have occurred in other segments of the agricultural industry. In general, the emphasis placed on hay and pasture has increased. In this connection, the introduction of lespedeza into the hay and pasture mixtures in many sections of the state has played an important part in increasing milk production.

4. Important changes also have occurred in the livestock enterprises other than dairying, the most significant of which has to do with the increase in the beef enterprise. The trend in number of cattle other than dairy cows has been upward since 1938. Prior to that time, the trend was downward. During more recent years, however, the number of cattle other than milk cows has tended to become established at slightly more than the 1920 level of two million head. As compared to the number of milk cows, the number of other cattle has increased most in the Kansas City and St. Louis supply areas.

5. Livestock other than cattle are also of considerable importance in the principal areas of milk production. Generally speaking, hogs have been of greatest importance in the Kansas City area, where the feed grains are produced in more abundance than in either the St. Louis area or the Southwest area. The sheep enterprise has been of greatest importance in the Kansas City and Southwest areas, while little difference in the emphasis on poultry is apparent in either of the areas.

6. The foregoing changes in farm enterprise relationships indicate that during recent years Missouri farmers have placed greater emphasis on livestock than on commercial crops. In line with this development, the relative importance of cash crops has decreased while that of hay and pasture crops has increased. In both the St. Louis and Kansas City fluid milk supply areas, the beef cattle enterprise is of greater importance than the dairy enterprise. Thus, the dairy enterprise must be maintained on a highly specialized basis to compete favorably with beef cattle. Although the beef enterprise ranks second in importance in the Southwest area, it provides the primary competition to dairying, especially on the larger farms where the utilization of pasture and roughage is a primary consideration.

7. With the growth of the Missouri dairy industry, marked changes have occurred in the pattern of utilization of the milk supply. The most

significant changes have been the declining trend in the percentage of the total production utilized in the manufacture of creamery butter, and the upward trend in the percentage used in various types of fluid milk products. From 1925 to 1938, the percentage of the total milk production utilized in the manufacture of creamery butter increased. Likewise, the percentage utilized in the production of cheese and evaporated milk increased considerably, while that used in the production of ice cream remained relatively stable. Since 1938, however, the pattern of utilization has changed greatly. The percentage utilized in creamery butter production declined from almost 60 per cent of the total farm production in 1938 to about 32 per cent in 1950. On the other hand, the percentage of milk used in other major dairy products, with some exceptions, has steadily increased. During more recent years, Missouri has become an important producer of such minor dairy products as nonfat dry milk solids, cottage cheese, sherbet, and fluid cream.

8. It may be concluded that the dairy industry has an important place in the agriculture of Missouri. As the state moves farther toward a livestock-pasture system of farm organization, it seems likely that dairying will continue to increase in importance both as a source of food for the growing population of the nation and as a dependable source of income to Missouri farmers.

APPENDIX

TABLE I -- GROUP CONTRIBUTIONS TO THE TOTAL MISSOURI CASH FARM INCOME, 1924-1950¹

| Year | Meat animals & wool | Poultry | Dairy | Field crops | Feed grains | Cash crops | Fruit & truck | Govt. pay- ment & all other |
|------|---------------------------|---------|-------|----------------|----------------|---------------|---------------------|-----------------------------------|
| | (Per cent) | | | | | | | |
| 1924 | 43.8 | 15.8 | 8.4 | 8.3 | 7.2 | 8.7 | 3.7 | 4.0 |
| 1925 | 45.1 | 16.2 | 8.6 | 8.7 | 7.6 | 6.0 | 4.2 | 3.4 |
| 1926 | 48.6 | 17.3 | 9.0 | 7.1 | 6.7 | 4.3 | 3.4 | 3.6 |
| 1927 | 50.3 | 16.5 | 10.3 | 6.8 | 5.3 | 4.2 | 3.2 | 3.5 |
| 1928 | 50.1 | 16.9 | 11.0 | 6.9 | 5.2 | 4.0 | 2.8 | 3.1 |
| 1929 | 50.3 | 16.6 | 12.2 | 5.5 | 3.1 | 6.2 | 3.3 | 2.9 |
| 1930 | 50.5 | 16.9 | 13.4 | 5.7 | 3.2 | 4.1 | 3.2 | 3.1 |
| 1931 | 49.7 | 17.0 | 15.6 | 3.9 | 2.6 | 4.1 | 4.1 | 3.1 |
| 1932 | 48.0 | 15.7 | 14.9 | 4.5 | 2.8 | 7.6 | 3.5 | 3.1 |
| 1933 | 50.7 | 12.4 | 13.2 | 5.3 | 4.1 | 6.0 | 3.5 | 4.9 ² |
| 1934 | 40.3 | 12.7 | 13.1 | 4.1 | 6.8 | 10.4 | 2.2 | 10.4 |
| 1935 | 46.4 | 14.5 | 12.8 | 1.7 | 4.6 | 5.2 | 3.1 | 11.7 |
| 1936 | 47.7 | 12.7 | 12.2 | 2.4 | 7.0 | 8.4 | 2.2 | 7.4 |
| 1937 | 43.8 | 12.3 | 13.2 | 3.2 | 9.3 | 7.2 | 3.1 | 8.0 |
| 1938 | 46.1 | 12.1 | 13.0 | 4.3 | 5.1 | 8.1 | 2.7 | 8.5 |
| 1939 | 44.4 | 10.5 | 11.2 | 4.1 | 5.2 | 8.7 | 2.4 | 13.5 |
| 1940 | 46.6 | 10.7 | 12.4 | 4.3 | 5.3 | 7.1 | 2.0 | 11.6 |
| 1941 | 49.8 | 11.1 | 11.6 | 3.7 | 2.7 | 12.5 | 2.0 | 6.5 |
| 1942 | 52.1 | 12.6 | 11.4 | 3.4 | 1.8 | 9.6 | 1.9 | 7.3 |
| 1943 | 50.7 | 15.3 | 12.0 | 4.5 | 1.1 | 7.7 | 2.1 | 6.6 |
| 1944 | 49.6 | 13.9 | 13.1 | 3.4 | 2.5 | 9.1 | 1.6 | 6.9 |
| 1945 | 51.3 | 15.3 | 12.8 | 4.3 | 2.5 | 5.7 | 2.3 | 5.9 |
| 1946 | 49.9 | 12.2 | 13.5 | 4.2 | 2.6 | 9.9 | 2.2 | 5.5 |
| 1947 | 55.5 | 10.6 | 11.7 | 4.5 | 3.3 | 9.1 | 1.7 | 3.6 |
| 1948 | 49.8 | 10.7 | 13.3 | 5.1 | 5.5 | 10.8 | 1.7 | 3.2 |
| 1949 | 48.3 | 12.1 | 12.0 | 6.8 | 5.2 | 11.4 | 1.3 | 3.0 |
| 1950 | 52.0 | 10.4 | 12.1 | 6.2 | 3.6 | 10.7 | 1.4 | 3.7 |

¹ Data obtained direct from State Statistician, United States Department of Agriculture, Bureau of Agricultural Economics, State Office, Columbia, Missouri.

² First year of government payments.

TABLE II -- ACREAGE OF CORN, WHEAT, AND TAME HAY IN MISSOURI, 1919-1949¹

| Year | Acresage of corn | Acresage of wheat (Thousand acres) | Acresage of tame hay |
|------|------------------------|---|----------------------------|
| 1919 | 6,272 | 4,577 | 2,721 |
| 1920 | 6,646 | 3,065 | 2,590 |
| 1921 | 6,095 | 3,249 | 3,269 |
| 1922 | 6,250 | 3,021 | 3,632 |
| 1923 | 6,562 | 2,810 | 3,325 |
| 1924 | 6,300 | 1,688 | 3,527 |
| 1925 | 6,741 | 1,754 | 3,286 |
| 1926 | 6,471 | 1,408 | 3,155 |
| 1927 | 5,796 | 1,562 | 3,569 |
| 1928 | 6,260 | 1,521 | 3,166 |
| 1929 | 5,566 | 1,534 | 3,536 |
| 1930 | 6,345 | 1,336 | 3,285 |
| 1931 | 6,472 | 1,596 | 3,142 |
| 1932 | 6,472 | 1,404 | 2,969 |
| 1933 | 6,019 | 1,362 | 2,824 |
| 1934 | 4,925 | 1,643 | 2,820 |
| 1935 | 3,940 | 2,145 | 2,528 |
| 1936 | 5,004 | 2,175 | 2,507 |
| 1937 | 4,360 | 3,264 | 2,287 |
| 1938 | 4,360 | 2,499 | 2,466 |
| 1939 | 4,281 | 1,918 | 2,898 |
| 1940 | 4,067 | 1,713 | 3,240 |
| 1941 | 3,904 | 1,336 | 3,193 |
| 1942 | 4,138 | 695 | 3,279 |
| 1943 | 4,510 | 973 | 3,132 |
| 1944 | 4,781 | 1,400 | 3,157 |
| 1945 | 3,920 | 1,553 | 3,222 |
| 1946 | 4,648 | 1,252 | 3,395 |
| 1947 | 4,018 | 1,321 | 3,804 |
| 1948 | 4,420 | 1,785 | 3,625 |
| 1949 | 4,243 | 1,946 | 3,734 |

¹ Data obtained from Missouri Annual Crop and Livestock Production, by Counties, 1919-1940, Missouri State Department of Agriculture, Bulletin 14, Vol. 40, December 31, 1942, pp. 8-70, and Missouri Farm Census by Counties, annual reports, 1941-1949.

TABLE III -- NUMBER OF MILK COWS AND OTHER CATTLE IN MISSOURI, 1920-1951¹

| Year | Number of milk cows, January 1 | Number cattle other than milk cows, January 1 |
|------|--------------------------------------|---|
| | (Thousand head) | |
| 1920 | 800 | 1,982 |
| 1921 | 792 | 1,968 |
| 1922 | 799 | 1,961 |
| 1923 | 799 | 1,901 |
| 1924 | 805 | 1,845 |
| 1925 | 835 | 1,607 |
| 1926 | 827 | 1,542 |
| 1927 | 817 | 1,455 |
| 1928 | 826 | 1,424 |
| 1929 | 877 | 1,473 |
| 1930 | 930 | 1,570 |
| 1931 | 995 | 1,635 |
| 1932 | 1,041 | 1,709 |
| 1933 | 1,080 | 1,770 |
| 1934 | 1,097 | 1,778 |
| 1935 | 1,017 | 1,514 |
| 1936 | 997 | 1,534 |
| 1937 | 926 | 1,424 |
| 1938 | 934 | 1,416 |
| 1939 | 926 | 1,529 |
| 1940 | 926 | 1,784 |
| 1941 | 963 | 1,883 |
| 1942 | 1,011 | 1,949 |
| 1943 | 1,052 | 2,176 |
| 1944 | 1,115 | 2,371 |
| 1945 | 1,148 | 2,232 |
| 1946 | 1,079 | 2,076 |
| 1947 | 1,007 | 2,044 |
| 1948 | 975 | 1,984 |
| 1949 | 956 | 2,003 |
| 1950 | 975 | 2,132 |
| 1951 | 994 | 2,362 |

¹ Data obtained from Missouri Annual Crop and Livestock Production, by Counties, 1919-1940, Missouri State Department of Agriculture, Bulletin 14, Vol. 40, December 31, 1942, pp. 84-95; Missouri Farm Census by Counties, annual reports, 1941-1947; and Missouri Livestock by Counties, annual reports, 1949-1951.

TABLE IV -- NUMBER OF HOGS, SHEEP, AND CHICKENS IN MISSOURI,
1920-1950¹

| Year | Number of hogs | Number of sheep (Thousand head) | Number of chickens |
|------|----------------------|--|--------------------------|
| 1920 | 3,889 | 1,312 | ----- |
| 1921 | 4,100 | 1,020 | ----- |
| 1922 | 4,410 | 797 | ----- |
| 1923 | 5,050 | 787 | ----- |
| 1924 | 4,860 | 765 | 30,963 |
| 1925 | 3,864 | 800 | 29,974 |
| 1926 | 3,600 | 810 | 30,260 |
| 1927 | 3,991 | 798 | 31,230 |
| 1928 | 4,270 | 810 | 30,747 |
| 1929 | 4,313 | 996 | 28,649 |
| 1930 | 3,750 | 1,040 | 30,000 |
| 1931 | 3,486 | 1,080 | 27,519 |
| 1932 | 4,100 | 1,102 | 25,484 |
| 1933 | 4,674 | 1,144 | 26,322 |
| 1934 | 4,113 | 1,175 | 25,269 |
| 1935 | 2,400 | 1,222 | 21,366 |
| 1936 | 2,760 | 1,246 | 21,200 |
| 1937 | 2,622 | 1,258 | 20,700 |
| 1938 | 2,622 | 1,321 | 19,200 |
| 1939 | 3,170 | 1,387 | 22,200 |
| 1940 | 3,920 | 1,525 | 23,460 |
| 1941 | 3,606 | 1,525 | 22,354 |
| 1942 | 3,931 | 1,517 | 25,444 |
| 1943 | 4,914 | 1,540 | 28,558 |
| 1944 | 5,405 | 1,493 | 29,493 |
| 1945 | 4,108 | 1,272 | 26,426 |
| 1946 | 4,120 | 1,132 | 26,707 |
| 1947 | 3,605 | 1,132 | 23,330 |
| 1948 | 3,533 | 1,075 | 22,907 |
| 1949 | 3,851 | 1,054 | 22,488 |
| 1950 | 4,429 | 1,054 | 24,124 |

¹ Data obtained from Missouri Annual Crop and Livestock Production, by Counties, 1919-1940, Missouri State Department of Agriculture, Bulletin 14, Vol. 40, December 31, 1942, pp. 8-70, and Missouri Livestock Reports by Counties, annual reports, 1941-1949.

TABLE V -- DISPOSITION IN PER CENT OF TOTAL MILK PRODUCTION IN MISSOURI 1924-1950¹

| Year | Percentage of Total Milk Production | | | |
|-------------------|-------------------------------------|--|---------------------------------------|--|
| | Fed or consumed on farms | Sold wholesale as farm butter and cream | Sold wholesale as whole milk | Sold retail as milk and cream |
| | | (Per cent) | | |
| 1924 | 39.6 | 46.2 | 7.7 | 6.5 |
| 1925 | 37.7 | 45.8 | 10.1 | 6.4 |
| 1926 | 35.3 | 48.1 | 10.4 | 6.2 |
| 1927 | 33.9 | 48.8 | 11.2 | 6.1 |
| 1928 | 32.0 | 49.9 | 12.2 | 5.9 |
| 1929 | 28.8 | 52.7 | 13.0 | 5.5 |
| 1930 | 27.4 | 52.3 | 14.8 | 5.5 |
| 1931 | 27.0 | 53.4 | 14.2 | 5.4 |
| 1932 | 28.7 | 52.4 | 18.4 | 5.5 |
| 1933 | 29.7 | 53.0 | 11.7 | 5.6 |
| 1934 | 30.9 | 51.6 | 11.7 | 5.8 |
| 1935 | 29.5 | 51.4 | 13.4 | 5.7 |
| 1936 | 30.8 | 46.2 | 17.0 | 6.0 |
| 1937 | 29.1 | 45.6 | 19.6 | 5.8 |
| 1938 | 27.3 | 47.0 | 20.4 | 5.3 |
| 1939 | 27.2 | 45.2 | 22.4 | 5.2 |
| 1940 | 25.6 | 42.3 | 27.1 | 5.0 |
| 1941 | 23.8 | 41.2 | 30.8 | 4.2 |
| 1942 | 21.8 | 37.4 | 36.9 | 3.9 |
| 1943 | 21.0 | 32.2 | 43.2 | 3.6 |
| 1944 | 19.9 | 27.6 | 49.1 | 3.4 |
| 1945 | 18.9 | 27.2 | 50.6 | 3.3 |
| 1946 | 20.0 | 21.2 | 55.4 | 3.4 |
| 1947 | 19.7 | 19.9 | 57.0 | 3.4 |
| 1948 | 19.6 | 20.1 | 57.0 | 3.3 |
| 1949 | 18.6 | 18.9 | 59.4 | 3.1 |
| 1950 ² | 18.3 | 18.9 | 59.7 | 3.2 |

¹ United States Department of Agriculture, Agricultural Marketing Service; Farm Production, Disposition and Income from Milk, 1924-1940, pp. 28-29, United States Department of Agriculture, Bureau of Agricultural Economics; Farm Production, Disposition, and Income by States, Revised Estimates, 1940-1944, pp. 2-8; 1944-45, pp. 8-9; 1945-46, p. 4; 1946-47, pp. 6-8; 1947-48, pp. 8-10; and 1949-1950, p. 10.

² Preliminary estimates.

TABLE VI -- NUMBER OF MILK COWS, SELECTED AREAS OF MISSOURI, 1920-1950¹

| Year | Cow Numbers In: | | | Total Number of Milk Cows in Missouri |
|------|--------------------------|----------------------------|----------------------------|---|
| | St. Louis Supply Area | Kansas City Supply Area | Southwest Missouri Area | |
| | (Thousand head) | | | |
| 1920 | 114.2 | 148.4 | 206.0 | 800.0 |
| 1921 | 113.9 | 144.1 | 207.0 | 792.0 |
| 1922 | 117.4 | 142.9 | 210.0 | 799.0 |
| 1923 | 113.9 | 141.7 | 211.0 | 799.0 |
| 1924 | 110.5 | 144.8 | 228.0 | 805.0 |
| 1925 | 118.4 | 145.9 | 221.0 | 835.0 |
| 1926 | 117.2 | 143.9 | 221.0 | 827.0 |
| 1927 | 114.5 | 140.9 | 224.0 | 817.0 |
| 1928 | 115.2 | 142.3 | 227.0 | 826.0 |
| 1929 | 119.4 | 152.9 | 247.0 | 877.0 |
| 1930 | 126.5 | 159.1 | 269.0 | 930.0 |
| 1931 | 131.2 | 167.6 | 299.0 | 995.0 |
| 1932 | 134.3 | 173.4 | 317.0 | 1,041.0 |
| 1933 | 135.0 | 176.9 | 340.0 | 1,080.0 |
| 1934 | 134.4 | 178.1 | 351.0 | 1,097.0 |
| 1935 | 129.3 | 164.7 | 319.0 | 1,017.0 |
| 1936 | 125.2 | 160.9 | 317.0 | 997.0 |
| 1937 | 116.7 | 150.3 | 292.0 | 926.0 |
| 1938 | 120.9 | 150.2 | 293.0 | 934.0 |
| 1939 | 117.9 | 150.1 | 289.0 | 926.0 |
| 1940 | 122.0 | 154.1 | 284.0 | 926.0 |
| 1941 | 126.6 | 160.9 | 296.0 | 963.0 |
| 1942 | 133.5 | 167.0 | 312.0 | 1,011.0 |
| 1943 | 139.6 | 172.5 | 324.0 | 1,052.0 |
| 1944 | 151.4 | 183.0 | 338.0 | 1,115.0 |
| 1945 | 159.3 | 184.3 | 345.0 | 1,148.0 |
| 1946 | 152.8 | 175.2 | 323.0 | 1,079.0 |
| 1947 | 127.2 | 157.2 | 355.0 | 1,007.0 |
| 1948 | 122.1 | 152.2 | 346.0 | 975.0 |
| 1949 | 118.9 | 149.6 | 342.0 | 956.0 |
| 1950 | 122.0 | 152.7 | 351.0 | 975.0 |

¹ Data obtained from Missouri Livestock by Counties, annual reports, 1920-1950, Missouri State Department of Agriculture.

TABLE VII -- BUTTERFAT-HOG AND BUTTERFAT-BEEF CATTLE PRICE RATIOS FOR THE UNITED STATES, 1910-1950¹

| Year | Butterfat-Hog Ratio ² | Butterfat-Beef Cattle Ratio ² |
|------|----------------------------------|--|
| 1910 | 3.26 | 5.49 |
| 1911 | 3.88 | 5.20 |
| 1912 | 4.05 | 5.10 |
| 1913 | 3.68 | 4.52 |
| 1914 | 3.44 | 3.98 |
| 1915 | 4.05 | 4.21 |
| 1916 | 3.56 | 4.45 |
| 1917 | 2.74 | 4.54 |
| 1918 | 2.87 | 4.77 |
| 1919 | 3.37 | 5.40 |
| 1920 | 4.34 | 6.44 |
| 1921 | 5.07 | 6.80 |
| 1922 | 4.39 | 6.43 |
| 1923 | 6.24 | 7.41 |
| 1924 | 5.64 | 6.91 |
| 1925 | 3.84 | 6.49 |
| 1926 | 3.56 | 6.18 |
| 1927 | 4.64 | 5.86 |
| 1928 | 5.32 | 4.87 |
| 1929 | 4.77 | 4.75 |
| 1930 | 3.95 | 4.52 |
| 1931 | 4.62 | 4.59 |
| 1932 | 5.49 | 4.28 |
| 1933 | 5.45 | 5.05 |
| 1934 | 5.59 | 5.61 |
| 1935 | 3.34 | 4.63 |
| 1936 | 3.48 | 5.53 |
| 1937 | 3.53 | 4.85 |
| 1938 | 3.42 | 4.06 |
| 1939 | 3.90 | 3.40 |
| 1940 | 5.30 | 3.82 |
| 1941 | 3.82 | 3.94 |
| 1942 | 3.09 | 3.80 |
| 1943 | 3.70 | 4.27 |
| 1944 | 4.29 | 5.18 |
| 1945 | 4.36 | 5.03 |
| 1946 | 4.34 | 5.07 |
| 1947 | 3.02 | 3.94 |
| 1948 | 3.41 | 3.52 |
| 1949 | 3.41 | 3.12 |
| 1950 | 3.35 | 2.70 |

¹ Dairy Situation, United States Department of Agriculture, Bureau of Agriculture Economics, May, 1950, p. 44 and October, 1950, p. 14.

² Number of Pounds of live animal required to equal the value of one pound of butterfat.

TABLE VIII -- AVERAGE NUMBER OF MILK COWS KEPT ON FARMS, SELECTED AREAS OF MISSOURI, 1925 and 1950¹

| St. Louis Supply Area | | | Kansas City Supply Area | | | Southwest Area | | |
|-----------------------|------|------|-------------------------|------|------|----------------|------|------|
| County | 1925 | 1950 | County | 1925 | 1950 | County | 1925 | 1950 |
| Cape Girardeau | 4.0 | 6.0 | Andrew | 4.4 | 5.9 | Barry | 3.4 | 6.7 |
| Crawford | 3.3 | 4.3 | Bates | 3.8 | 6.7 | Barton | 3.6 | 5.5 |
| Franklin | 3.8 | 6.2 | Buchanan | 5.3 | 4.9 | Camden | 3.5 | 4.6 |
| Gasconade | 3.9 | 5.4 | Caldwell | 3.5 | 4.8 | Cedar | 3.3 | 5.3 |
| Jefferson | 4.7 | 5.7 | Cass | 5.3 | 7.3 | Christian | 4.1 | 8.6 |
| Lincoln | 3.0 | 3.4 | Clay | 3.4 | 4.2 | Dade | 3.5 | 6.7 |
| Maries | 4.2 | 4.5 | Clinton | 3.3 | 5.0 | Dallas | 4.3 | 7.1 |
| Marion | 4.4 | 6.7 | DeKalb | 3.4 | 4.8 | Douglas | 3.9 | 7.8 |
| Montgomery | 2.9 | 3.4 | Henry | 4.0 | 4.6 | Greene | 5.1 | 8.8 |
| Osage | 3.5 | 5.9 | Jackson | 6.3 | 5.6 | Hickory | 3.6 | 6.2 |
| Perry | 3.3 | 5.2 | Johnson | 4.4 | 5.0 | Howell | 3.8 | 5.6 |
| Pike | 3.3 | 3.6 | Lafayette | 3.8 | 5.7 | Jasper | 3.5 | 6.2 |
| Ralls | 4.8 | 5.5 | Platte | 2.6 | 3.7 | Laclede | 3.7 | 6.1 |
| St. Charles | 3.4 | 5.1 | Ray | 2.9 | 4.7 | Lawrence | 4.0 | 7.6 |
| St. Francois | 3.7 | 5.1 | St. Clair | 3.7 | 5.3 | McDonald | 2.8 | 5.9 |
| Ste. Genevieve | 2.6 | 3.2 | Vernon | 3.8 | 5.2 | Newton | 3.5 | 6.5 |
| St. Louis | 2.6 | 3.1 | | | | Ozark | 3.5 | 6.2 |
| Warren | 3.1 | 4.2 | | | | Polk | 4.5 | 7.9 |
| Washington | 2.8 | 3.0 | | | | Pulaski | 3.5 | 4.6 |
| | | | | | | Stone | 3.3 | 7.4 |
| | | | | | | Taney | 3.0 | 5.5 |
| | | | | | | Texas | 3.7 | 6.2 |
| | | | | | | Webster | 5.4 | 9.2 |
| | | | | | | Wright | 4.3 | 9.2 |

¹ United States Census of Agriculture, 1925 and 1950, Bureau of the Census, Department of Commerce, Washington, D. C.

TABLE IX -- ACREAGE OF CORN, SELECTED AREAS OF MISSOURI,
1920-1949¹

| Year | Corn Acreage In: | | | Total Corn Acreage in Missouri |
|------|--------------------------|----------------------------|----------------------------|--------------------------------------|
| | St. Louis Supply Area | Kansas City Supply Area | Southwest Missouri Area | |
| | | (Thousand acres) | | |
| 1920 | 729.3 | 1,309.1 | 947.0 | 6,646.0 |
| 1921 | 679.4 | 1,217.6 | 827.0 | 6,095.0 |
| 1922 | 699.1 | 1,322.8 | 854.0 | 6,250.0 |
| 1923 | 717.3 | 1,448.9 | 950.0 | 6,562.0 |
| 1924 | 649.1 | 1,374.0 | 892.0 | 6,300.0 |
| 1925 | 751.1 | 1,441.7 | 941.0 | 6,741.0 |
| 1926 | 735.9 | 1,402.4 | 897.0 | 6,471.0 |
| 1927 | 581.3 | 1,328.9 | 815.0 | 5,796.0 |
| 1928 | 669.5 | 1,448.7 | 913.0 | 6,260.0 |
| 1929 | 600.3 | 1,225.7 | 823.0 | 5,566.0 |
| 1930 | 714.9 | 1,433.0 | 841.0 | 6,345.0 |
| 1931 | 737.5 | 1,456.1 | 905.0 | 6,472.0 |
| 1932 | 734.0 | 1,501.1 | 919.0 | 6,472.0 |
| 1933 | 630.6 | 1,411.5 | 901.0 | 6,019.0 |
| 1934 | 584.5 | 1,045.8 | 680.0 | 4,925.0 |
| 1935 | 425.1 | 836.7 | 584.0 | 3,940.0 |
| 1936 | 596.6 | 1,093.4 | 656.0 | 5,004.0 |
| 1937 | 544.0 | 898.1 | 550.0 | 4,360.0 |
| 1938 | 516.5 | 931.3 | 516.0 | 4,360.0 |
| 1939 | 522.3 | 955.7 | 486.0 | 4,281.0 |
| 1940 | 509.8 | 878.4 | 467.0 | 4,067.0 |
| 1941 | 483.6 | 830.0 | 439.0 | 3,904.0 |
| 1942 | 509.7 | 886.7 | 520.0 | 4,138.0 |
| 1943 | 544.2 | 1,012.7 | 500.0 | 4,510.0 |
| 1944 | 626.4 | 1,078.8 | 484.0 | 4,781.0 |
| 1945 | 513.3 | 836.3 | 348.0 | 3,920.0 |
| 1946 | 616.1 | 1,018.7 | 404.0 | 4,648.0 |
| 1947 | 549.0 | 881.0 | 347.0 | 4,018.0 |
| 1948 | 609.6 | 955.4 | 355.0 | 4,420.0 |
| 1949 | 595.1 | 910.2 | 359.0 | 4,243.0 |

¹ Data obtained from Missouri Annual Crop and Livestock Production, by Counties, Missouri State Department of Agriculture.

TABLE X -- ACREAGE OF WHEAT, SELECTED AREAS OF MISSOURI,
1920-1949¹

| Year | Wheat Acreage In: | | | Total Wheat Acreage in Missouri |
|------|--------------------------|----------------------------|----------------------------|---------------------------------------|
| | St. Louis Supply Area | Kansas City Supply Area | Southwest Missouri Area | |
| | | | (Thousand acres) | |
| 1920 | 660.3 | 677.6 | 543.0 | 3,065.0 |
| 1921 | 729.1 | 682.6 | 634.0 | 3,249.0 |
| 1922 | 660.3 | 577.6 | 586.0 | 3,021.0 |
| 1923 | 704.4 | 503.5 | 496.0 | 2,810.0 |
| 1924 | 483.6 | 257.6 | 289.0 | 1,688.0 |
| 1925 | 462.0 | 273.4 | 299.0 | 1,754.0 |
| 1926 | 368.6 | 230.8 | 366.0 | 1,408.0 |
| 1927 | 398.4 | 283.1 | 378.0 | 1,562.0 |
| 1928 | 270.6 | 325.3 | 352.0 | 1,521.0 |
| 1929 | 335.4 | 343.5 | 295.0 | 1,534.0 |
| 1930 | 343.0 | 273.2 | 241.0 | 1,336.0 |
| 1931 | 414.5 | 277.4 | 300.0 | 1,596.0 |
| 1932 | 340.7 | 234.6 | 292.0 | 1,404.0 |
| 1933 | 381.1 | 211.8 | 249.0 | 1,362.0 |
| 1934 | 412.8 | 319.0 | 311.0 | 1,643.0 |
| 1935 | 430.7 | 483.1 | 500.0 | 2,145.0 |
| 1936 | 413.7 | 542.5 | 413.0 | 2,175.0 |
| 1937 | 553.9 | 889.8 | 580.0 | 3,264.0 |
| 1938 | 459.3 | 662.0 | 457.0 | 2,499.0 |
| 1939 | 396.1 | 495.0 | 318.0 | 1,918.0 |
| 1940 | 353.1 | 464.3 | 293.0 | 1,713.0 |
| 1941 | 348.8 | 281.5 | 286.0 | 1,336.0 |
| 1942 | 156.3 | 167.2 | 90.0 | 695.0 |
| 1943 | 232.3 | 222.4 | 157.0 | 973.0 |
| 1944 | 369.0 | 285.6 | 259.0 | 1,400.0 |
| 1945 | 407.5 | 310.2 | 286.0 | 1,553.0 |
| 1946 | 316.5 | 254.0 | 218.0 | 1,252.0 |
| 1947 | 366.4 | 254.0 | 222.0 | 1,321.0 |
| 1948 | 420.9 | 383.7 | 265.0 | 1,785.0 |
| 1949 | 426.3 | 451.8 | 275.0 | 1,946.0 |

¹ Data obtained from Missouri Annual Crop and Livestock Production, by Counties, Missouri State Department of Agriculture.

TABLE XI -- ACREAGE OF TAME HAY, SELECTED AREAS OF MISSOURI, 1920-1949¹

| Year | Tame Hay Acreage In: | | | Total Tame Hay Acreage in Missouri |
|------|-----------------------|-------------------------|-------------------------|------------------------------------|
| | St. Louis Supply Area | Kansas City Supply Area | Southwest Missouri Area | |
| | (Thousand acres) | | | |
| 1920 | 385.3 | 383.5 | 461.0 | 2,590.0 |
| 1921 | 455.7 | 472.8 | 621.0 | 3,269.0 |
| 1922 | 527.9 | 561.4 | 641.0 | 3,632.0 |
| 1923 | 470.1 | 503.5 | 617.0 | 3,325.0 |
| 1924 | 540.0 | 524.6 | 641.0 | 3,527.0 |
| 1925 | 496.5 | 504.6 | 589.0 | 3,286.0 |
| 1926 | 471.4 | 482.1 | 548.0 | 3,155.0 |
| 1927 | 522.2 | 546.3 | 616.0 | 3,569.0 |
| 1928 | 471.9 | 468.6 | 574.0 | 3,166.0 |
| 1929 | 488.8 | 502.2 | 645.0 | 3,536.0 |
| 1930 | 471.6 | 466.2 | 581.0 | 3,285.0 |
| 1931 | 488.0 | 425.8 | 481.0 | 3,142.0 |
| 1932 | 482.7 | 413.4 | 439.0 | 2,969.0 |
| 1933 | 412.8 | 410.6 | 389.0 | 2,824.0 |
| 1934 | 435.0 | 351.1 | 423.0 | 2,820.0 |
| 1935 | 389.2 | 298.5 | 374.0 | 2,528.0 |
| 1936 | 425.4 | 314.0 | 336.0 | 2,507.0 |
| 1937 | 364.0 | 228.9 | 398.0 | 2,287.0 |
| 1938 | 427.2 | 218.9 | 498.0 | 2,466.0 |
| 1939 | 470.4 | 300.0 | 626.0 | 2,898.0 |
| 1940 | 506.4 | 417.1 | 550.0 | 3,240.0 |
| 1941 | 443.0 | 420.0 | 652.0 | 3,193.0 |
| 1942 | 467.0 | 433.8 | 674.0 | 3,279.0 |
| 1943 | 469.7 | 394.5 | 648.0 | 3,132.0 |
| 1944 | 450.1 | 459.1 | 615.0 | 3,157.0 |
| 1945 | 433.2 | 481.9 | 644.0 | 3,222.0 |
| 1946 | 493.5 | 496.1 | 656.0 | 3,395.0 |
| 1947 | 547.5 | 609.3 | 771.0 | 3,804.0 |
| 1948 | 479.7 | 563.7 | 735.0 | 3,625.0 |
| 1949 | 508.7 | 572.5 | 775.0 | 3,734.0 |

¹ Data obtained from Missouri Annual Crop and Livestock Production, by Counties, Missouri State Department of Agriculture.

TABLE XII -- NUMBER OF MILK COWS AND OTHER CATTLE, SELECTED AREAS OF MISSOURI, 1920-1951¹

| Year | St. Louis Supply Area | | Kansas City Supply Area | | Southwest Area | |
|------|--------------------------|-----------------|----------------------------|-----------------|-------------------|-----------------|
| | Milk cows | Other cattle | Milk cows | Other cattle | Milk cows | Other cattle |
| | (Thousand head) | | | | | |
| 1920 | 114.2 | 221.6 | 148.4 | 324.6 | 206.0 | 389.0 |
| 1921 | 113.9 | 214.9 | 144.1 | 332.9 | 207.0 | 391.0 |
| 1922 | 117.4 | 221.6 | 142.9 | 342.9 | 210.0 | 384.0 |
| 1923 | 113.9 | 202.9 | 141.7 | 359.8 | 211.0 | 354.0 |
| 1924 | 110.5 | 203.5 | 144.8 | 366.9 | 228.0 | 314.0 |
| 1925 | 118.4 | 174.8 | 145.9 | 319.4 | 221.0 | 282.0 |
| 1926 | 117.2 | 162.0 | 143.9 | 308.3 | 221.0 | 280.0 |
| 1927 | 114.5 | 152.2 | 140.9 | 288.2 | 224.0 | 267.0 |
| 1928 | 115.2 | 148.2 | 142.3 | 281.7 | 227.0 | 277.0 |
| 1929 | 119.4 | 152.8 | 152.9 | 285.9 | 247.0 | 302.0 |
| 1930 | 126.5 | 174.1 | 159.1 | 306.8 | 269.0 | 328.0 |
| 1931 | 131.2 | 188.8 | 167.6 | 321.4 | 299.0 | 318.0 |
| 1932 | 134.3 | 204.0 | 173.4 | 336.6 | 317.0 | 316.0 |
| 1933 | 135.0 | 219.6 | 176.9 | 350.5 | 340.0 | 304.0 |
| 1934 | 134.4 | 227.3 | 178.1 | 352.6 | 351.0 | 286.0 |
| 1935 | 129.3 | 192.4 | 164.7 | 301.2 | 319.0 | 231.0 |
| 1936 | 125.2 | 197.6 | 160.9 | 290.8 | 317.0 | 236.0 |
| 1937 | 116.7 | 194.9 | 150.3 | 253.2 | 292.0 | 224.0 |
| 1938 | 120.9 | 192.8 | 150.2 | 235.3 | 293.0 | 244.0 |
| 1939 | 117.9 | 213.3 | 150.1 | 246.5 | 289.0 | 264.0 |
| 1940 | 122.0 | 242.2 | 154.1 | 300.3 | 284.0 | 324.0 |
| 1941 | 126.6 | 254.2 | 160.9 | 320.0 | 296.0 | 329.0 |
| 1942 | 133.5 | 263.6 | 167.0 | 335.3 | 312.0 | 343.0 |
| 1943 | 139.6 | 286.5 | 172.5 | 373.5 | 324.0 | 331.0 |
| 1944 | 151.4 | 322.1 | 183.0 | 418.9 | 338.0 | 437.0 |
| 1945 | 159.3 | 310.7 | 184.3 | 370.1 | 345.0 | 408.0 |
| 1946 | 152.8 | 294.1 | 175.2 | 337.1 | 323.0 | 325.0 |
| 1947 | 127.2 | 282.2 | 157.2 | 379.7 | 355.0 | 413.0 |
| 1948 | 122.1 | 271.3 | 152.2 | 369.5 | 346.0 | 395.0 |
| 1949 | 118.9 | 265.5 | 149.6 | 373.5 | 342.0 | 411.0 |
| 1950 | 122.0 | 315.1 | 152.7 | 407.8 | 351.0 | 432.0 |

¹ Data obtained from Missouri Livestock by Counties, Missouri State Department of Agriculture.

TABLE XIII -- NUMBER OF HOGS, SELECTED AREAS OF MISSOURI,
1920-1950¹

| Year | Hog Numbers In: | | | Total Number Of Hogs in Missouri |
|------|--------------------------|----------------------------|----------------------------|--|
| | St. Louis Supply Area | Kansas City Supply Area | Southwest Missouri Area | |
| | (Thousand head) | | | |
| 1920 | 482.0 | 839.1 | 515.0 | 3,889.0 |
| 1921 | 496.5 | 884.8 | 521.0 | 4,100.0 |
| 1922 | 520.7 | 1,073.9 | 524.0 | 4,410.0 |
| 1923 | 557.7 | 1,200.9 | 580.0 | 5,050.0 |
| 1924 | 529.1 | 1,192.6 | 524.0 | 4,860.0 |
| 1925 | 434.4 | 923.5 | 416.0 | 3,864.0 |
| 1926 | 410.6 | 836.5 | 399.0 | 3,600.0 |
| 1927 | 446.1 | 937.3 | 447.0 | 3,991.0 |
| 1928 | 473.1 | 1,027.8 | 488.0 | 4,270.0 |
| 1929 | 484.8 | 1,144.4 | 424.0 | 4,313.0 |
| 1930 | 455.6 | 1,012.1 | 318.0 | 3,750.0 |
| 1931 | 427.3 | 915.4 | 310.0 | 3,486.0 |
| 1932 | 495.0 | 1,046.6 | 416.0 | 4,100.0 |
| 1933 | 576.8 | 1,139.6 | 494.0 | 4,674.0 |
| 1934 | 499.6 | 976.7 | 461.0 | 4,113.0 |
| 1935 | 296.5 | 551.0 | 275.0 | 2,400.0 |
| 1936 | 351.9 | 617.9 | 338.0 | 2,760.0 |
| 1937 | 354.7 | 567.8 | 372.0 | 2,622.0 |
| 1938 | 365.8 | 566.1 | 362.0 | 2,622.0 |
| 1939 | 432.3 | 703.5 | 427.0 | 3,170.0 |
| 1940 | 522.0 | 867.3 | 478.0 | 3,920.0 |
| 1941 | 523.7 | 795.6 | 421.0 | 3,606.0 |
| 1942 | 560.8 | 898.8 | 462.0 | 3,931.0 |
| 1943 | 697.1 | 1,127.2 | 554.0 | 4,914.0 |
| 1944 | 779.0 | 1,253.7 | 613.0 | 5,405.0 |
| 1945 | 635.5 | 924.5 | 409.0 | 4,108.0 |
| 1946 | 625.8 | 950.1 | 406.0 | 4,120.0 |
| 1947 | 591.4 | 816.3 | 324.0 | 3,605.0 |
| 1948 | 578.3 | 807.3 | 321.0 | 3,533.0 |
| 1949 | 608.6 | 880.6 | 369.0 | 3,851.0 |
| 1950 | 732.4 | 1,040.1 | 395.0 | 4,429.0 |

¹ Data obtained from Missouri Livestock by Counties, Missouri State Department of Agriculture.

TABLE XIV -- NUMBER OF SHEEP, SELECTED AREA OF MISSOURI,
1920-1950¹

| Year | Sheep Numbers In: | | | Total Sheep Numbers in Missouri |
|------|--------------------------|----------------------------|----------------------------|---------------------------------------|
| | St. Louis Supply Area | Kansas City Supply Area | Southwest Missouri Area | |
| | | | (Thousand head) | |
| 1920 | 109.8 | 180.3 | 152.0 | 1,312.0 |
| 1921 | 100.6 | 155.1 | 135.0 | 1,020.0 |
| 1922 | 78.5 | 112.3 | 104.0 | 797.0 |
| 1923 | 77.5 | 109.9 | 101.0 | 787.0 |
| 1924 | 73.9 | 110.3 | 99.0 | 765.0 |
| 1925 | 79.4 | 117.9 | 105.0 | 800.0 |
| 1926 | 79.8 | 122.8 | 109.0 | 810.0 |
| 1927 | 77.0 | 126.9 | 111.0 | 798.0 |
| 1928 | 77.3 | 132.6 | 114.0 | 810.0 |
| 1929 | 93.6 | 166.0 | 140.0 | 996.0 |
| 1930 | 97.1 | 171.0 | 247.0 | 1,040.0 |
| 1931 | 98.8 | 181.1 | 254.0 | 1,080.0 |
| 1932 | 100.9 | 188.5 | 158.0 | 1,102.0 |
| 1933 | 107.5 | 198.2 | 162.0 | 1,144.0 |
| 1934 | 108.6 | 208.9 | 112.0 | 1,175.0 |
| 1935 | 113.8 | 221.3 | 178.0 | 1,222.0 |
| 1936 | 111.7 | 221.1 | 188.0 | 1,246.0 |
| 1937 | 112.3 | 212.3 | 195.0 | 1,258.0 |
| 1938 | 116.9 | 212.9 | 212.0 | 1,321.0 |
| 1939 | 118.1 | 216.4 | 223.0 | 1,387.0 |
| 1940 | 125.8 | 235.3 | 244.0 | 1,525.0 |
| 1941 | 124.8 | 236.1 | 246.0 | 1,525.0 |
| 1942 | 125.9 | 244.1 | 254.0 | 1,517.0 |
| 1943 | 123.9 | 238.9 | 254.0 | 1,540.0 |
| 1944 | 117.3 | 235.8 | 249.0 | 1,493.0 |
| 1945 | 104.0 | 192.5 | 210.0 | 1,272.0 |
| 1946 | 90.7 | 173.7 | 188.0 | 1,132.0 |
| 1947 | 82.1 | 175.1 | 221.0 | 1,132.0 |
| 1948 | 76.1 | 165.6 | 203.0 | 1,075.0 |
| 1949 | 71.2 | 164.4 | 196.0 | 1,054.0 |
| 1950 | 71.7 | 163.2 | 186.0 | 1,054.0 |

¹ Data obtained from Missouri Livestock by Counties, Missouri State Department of Agriculture.

TABLE XV -- NUMBER OF CHICKENS, SELECTED AREAS OF MISSOURI, 1924-1950¹

| Year | Chicken Numbers in: | | | Total Chicken Numbers in Missouri |
|------|-----------------------|-------------------------|-------------------------|-----------------------------------|
| | St. Louis Supply Area | Kansas City Supply Area | Southwest Missouri Area | |
| | | | (Thousand head) | |
| 1924 | 4,513.0 | 5,937.0 | 5,733.0 | 30,963.0 |
| 1925 | 4,412.0 | 5,801.0 | 5,606.0 | 29,974.0 |
| 1926 | 4,466.0 | 5,844.0 | 5,785.0 | 30,260.0 |
| 1927 | 4,615.0 | 6,090.0 | 6,115.0 | 31,230.0 |
| 1928 | 4,555.0 | 6,019.0 | 6,182.0 | 30,747.0 |
| 1929 | 4,264.0 | 5,649.0 | 5,867.0 | 28,649.0 |
| 1930 | 4,266.0 | 5,732.0 | 6,587.0 | 30,000.0 |
| 1931 | 4,138.0 | 5,441.0 | 5,871.0 | 27,519.0 |
| 1932 | 3,898.0 | 4,993.0 | 5,497.0 | 25,484.0 |
| 1933 | 4,092.0 | 5,085.0 | 5,739.0 | 26,322.0 |
| 1934 | 4,026.0 | 4,809.0 | 5,493.0 | 25,269.0 |
| 1935 | 3,399.0 | 3,943.0 | 4,641.0 | 21,366.0 |
| 1936 | 3,424.0 | 3,888.0 | 4,563.0 | 21,200.0 |
| 1937 | 3,321.0 | 3,762.0 | 4,443.0 | 20,700.0 |
| 1938 | 3,048.0 | 3,471.0 | 4,093.0 | 19,200.0 |
| 1939 | 3,426.0 | 4,031.0 | 4,726.0 | 22,200.0 |
| 1940 | 3,529.0 | 4,295.0 | 4,952.0 | 23,460.0 |
| 1941 | 3,425.0 | 4,133.0 | 4,643.0 | 22,354.0 |
| 1942 | 3,824.7 | 4,718.5 | 5,311.0 | 25,444.0 |
| 1943 | 4,434.9 | 5,265.6 | 5,971.0 | 28,558.0 |
| 1944 | 4,638.8 | 5,455.4 | 5,774.0 | 29,493.0 |
| 1945 | 4,221.5 | 4,908.4 | 5,245.0 | 26,426.0 |
| 1946 | 4,387.5 | 5,074.4 | 5,234.0 | 26,707.0 |
| 1947 | 4,046.0 | 3,879.7 | 5,175.0 | 23,330.0 |
| 1948 | 3,934.4 | 3,797.3 | 5,124.0 | 22,907.0 |
| 1949 | 3,774.3 | 3,692.3 | 5,218.0 | 22,488.0 |
| 1950 | 3,993.8 | 4,086.7 | 5,354.0 | 24,124.0 |

¹ Data obtained from Missouri Livestock by Counties, Missouri State Department of Agriculture.

TABLE XVI -- AVERAGE SIZE OF FARMS IN MISSOURI AND THE ST. LOUIS SUPPLY AREA, 1920-1945¹

| Year | Missouri | (Acres) | St. Louis Supply Area |
|------|----------|---------|-----------------------------|
| 1920 | 132.2 | | 139.7 |
| 1925 | 125.3 | | 137.1 |
| 1930 | 131.8 | | 142.5 |
| 1935 | 125.9 | | 134.0 |
| 1940 | 135.6 | | 141.6 |
| 1945 | 145.2 | | 149.4 |

AVERAGE SIZE OF FARMS IN MISSOURI AND THE KANSAS CITY SUPPLY AREA, 1920-1945¹

| Year | Missouri | (Acres) | Kansas City Supply Area |
|------|----------|---------|----------------------------|
| 1920 | 132.2 | | 128.4 |
| 1925 | 125.3 | | 124.1 |
| 1930 | 131.8 | | 130.7 |
| 1935 | 125.9 | | 125.5 |
| 1940 | 135.6 | | 134.4 |
| 1945 | 145.2 | | 146.5 |

AVERAGE SIZE OF FARMS IN MISSOURI AND THE SOUTHWEST AREA, 1920-1945¹

| Year | Missouri | (Acres) | Southwest Area |
|------|----------|---------|-------------------|
| 1920 | 132.2 | | 128.3 |
| 1925 | 125.3 | | 115.1 |
| 1930 | 131.8 | | 122.1 |
| 1935 | 125.9 | | 116.3 |
| 1940 | 135.6 | | 122.4 |
| 1945 | 145.2 | | 130.4 |

¹ Department of Commerce, Bureau of the Census: United States Census of Agriculture, 1925, Part I, pp. 904-917; United States Census of Agriculture, 1935, Vol. X, pp. 262-271; United States Census of Agriculture, 1945, Vol. I, Part 10, pp. 18-41; Preliminary 1950 Census of Agriculture Farms, Farm Characteristics and Farm Products, United States Government Printing Office, Washington, D. C.

TABLE XVII -- MILK-FEED AND BUTTERFAT-FEED PRICE RATIOS FOR THE UNITED STATES, 1910-1950¹

| Year | Milk-Feed Ratio ² | Butterfat-Feed Ratio ² |
|------|------------------------------|-----------------------------------|
| 1910 | 1.08 | 20.7 |
| 1911 | 1.03 | 19.1 |
| 1912 | 1.05 | 20.0 |
| 1913 | 1.14 | 22.6 |
| 1914 | 1.08 | 19.0 |
| 1915 | 1.06 | 18.8 |
| 1916 | 1.08 | 20.7 |
| 1917 | 1.04 | 17.6 |
| 1918 | 1.20 | 18.9 |
| 1919 | 1.16 | 20.9 |
| 1920 | 1.06 | 22.0 |
| 1921 | 1.31 | 29.1 |
| 1922 | 1.18 | 26.0 |
| 1923 | 1.22 | 26.4 |
| 1924 | 1.09 | 23.6 |
| 1925 | 1.15 | 24.4 |
| 1926 | 1.31 | 28.3 |
| 1927 | 1.32 | 28.0 |
| 1928 | 1.19 | 26.1 |
| 1929 | 1.24 | 26.8 |
| 1930 | 1.23 | 24.0 |
| 1931 | 1.34 | 26.0 |
| 1932 | 1.31 | 25.2 |
| 1933 | 1.21 | 23.3 |
| 1934 | 1.09 | 18.7 |
| 1935 | 1.13 | 21.0 |
| 1936 | 1.24 | 24.6 |
| 1937 | 1.12 | 21.8 |
| 1938 | 1.32 | 25.1 |
| 1939 | 1.29 | 22.6 |
| 1940 | 1.29 | 24.0 |
| 1941 | 1.39 | 26.4 |
| 1942 | 1.32 | 24.4 |
| 1943 | 1.35 | 24.8 |
| 1944 | 1.38 | 24.4 |
| 1945 | 1.42 | 27.5 |
| 1946 | 1.38 | 26.8 |
| 1947 | 1.18 | 21.8 |
| 1948 | 1.26 | 22.5 |
| 1949 | 1.28 | 23.3 |
| 1950 | 1.24 | 22.2 |

¹ Dairy Situation, United States Department of Agriculture, Bureau of Agricultural Economics, May, 1950, p. 44 and October, 1950, p. 14.

² Number of pounds of feed required to equal the value of one pound of milk or butterfat.

TABLE XVIII -- PERCENTAGE UTILIZATION OF TOTAL MILK PRODUCTION
IN SPECIFIED DAIRY PRODUCTS, MISSOURI, 1925-1950¹

| Year | Percentage of Total Production in Milk Equivalents ² | | | |
|------|---|--------------------|--------------------|--------------|
| | Creamery butter | American cheese | Evaporated milk | Ice cream |
| | (Per cent) | | | |
| 1925 | 43.9 | 0.1 | 0.9 | 3.3 |
| 1926 | 50.1 | 0.1 | 1.1 | 3.2 |
| 1927 | 45.2 | 0.2 | 1.6 | 2.6 |
| 1928 | 47.2 | 0.8 | 1.7 | 2.7 |
| 1929 | 52.2 | 1.3 | 2.4 | 3.0 |
| 1930 | 47.1 | 0.9 | 2.6 | 2.9 |
| 1931 | 46.0 | 0.9 | 2.1 | 2.3 |
| 1932 | 47.0 | 1.0 | 2.3 | 1.9 |
| 1933 | 50.6 | 1.3 | 2.2 | 1.8 |
| 1934 | 52.8 | 1.6 | 2.2 | 1.9 |
| 1935 | 54.6 | 2.4 | 2.3 | 2.4 |
| 1936 | 51.7 | 2.5 | 3.2 | 3.4 |
| 1937 | 54.5 | 3.2 | 4.5 | 3.8 |
| 1938 | 59.9 | 3.7 | 4.6 | 3.6 |
| 1939 | 54.2 | 4.0 | 4.9 | 3.9 |
| 1940 | 50.9 | 5.7 | 6.0 | 3.9 |
| 1941 | 51.1 | 9.3 | 8.0 | 4.7 |
| 1942 | 42.6 | 10.9 | 8.8 | 5.4 |
| 1943 | 40.9 | 9.7 | 9.1 | 4.7 |
| 1944 | 37.0 | 11.2 | 9.9 | 4.7 |
| 1945 | 35.8 | 11.9 | 10.5 | 4.7 |
| 1946 | 30.9 | 11.5 | 9.2 | 7.7 |
| 1947 | 32.7 | 13.9 | 9.5 | 6.9 |
| 1948 | 31.6 | 13.7 | 11.1 | 6.0 |
| 1949 | 34.5 | 14.8 | 8.3 | 5.4 |
| 1950 | 31.5 | 14.4 | 8.0 | 5.5 |

¹ Data obtained from Production of Manufactured Dairy Products, United States Department of Agriculture, Bureau of Agricultural Economics, 1945 issue, pp. 47-49; 1950 issue, pp. 40-49, and other related data.

² The conversion factors used to obtain milk equivalents were: butter x 21; cheese x 10; evaporated milk x 2.2; and ice cream x 15.