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Development of the dairy industry in Mississippi

D. W. Parvin

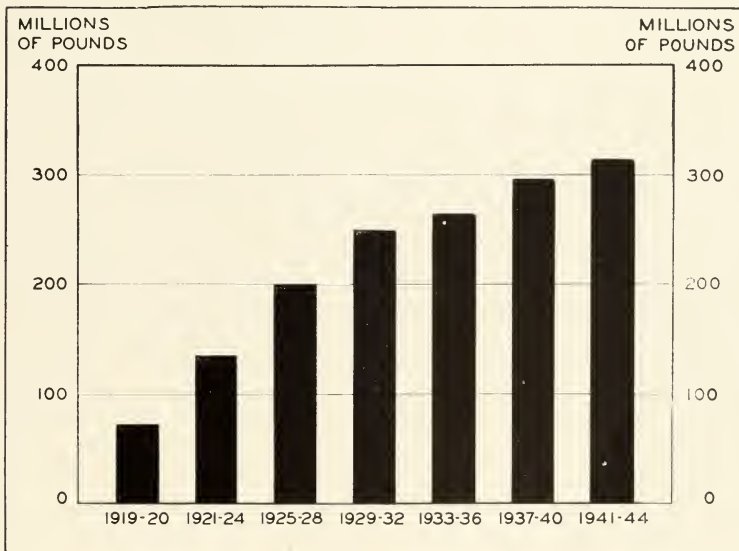
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Development of the
DAIRY INDUSTRY
in Mississippi



Pounds of milk or its equivalent purchased annually by plants manufacturing dairy products in Mississippi

MISSISSIPPI STATE COLLEGE
AGRICULTURAL EXPERIMENT STATION

CLARENCE DORMAN, DIRECTOR

TABLE OF CONTENTS

	Page
Introduction	5
Source of data	5
Definition of terms	6
Dairy farming in Mississippi	6
Historical development of dairy manufacturing plants	11
Butterfat purchased from producers	12
Butterfat manufactured	19
Solids not fat manufactured	20
Volume per plant manufacturing dairy products	20
Dairy products manufactured	22
Butter	22
Cheese	23
Condensed milk	25
Concentrated by-products	25
Fluid milk sales and ice cream produced	26
Relative importance of various dairy products	27
Development by areas	28
Seasonal variation in milk and butterfat purchases	33
Relation of seasonal production to plant capacity and efficiency of operation	36
Relation of seasonal variation to efficiency of milk transportation	38
Prices paid producers for milk and butterfat	39
Seasonal variation in prices	40
Summary	43

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This is the first of a series of studies designed to provide a general picture of dairying in Mississippi, to point out problems in milk production and processing, and to provide factual information that should aid in the solution of these problems.

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Development of the Dairy Industry in Mississippi

By D. W. PARVIN

Associate Agricultural Economist

Over a long period of years, agricultural leaders of Mississippi have emphasized the need for increasing dairying within the State. This emphasis has been based partially on certain natural advantages and partially on the danger of placing too much emphasis on cotton as the almost exclusive cash crop in most sections of the State. The prospective unfavorable post-war outlook for cotton gives added emphasis to the need for re-examining and re-emphasizing the possibility of and need for expanding dairy production in those areas that have natural advantages in milk production.

This study is designed to give perspective to the possibility of expanding dairy production in Mississippi. No attempt was made to derive or work out possible solutions for problems confronting the dairy industry; however, data have been provided that should point the way to the solution of these problems by trained dairy production and marketing men.

Source of Data

The Mississippi Department of Agriculture and Commerce has on file annual reports of all dairy plants since 1929 and annual reports of manufacturing plants only, since 1919. These individual plant reports give the amount of milk and butterfat purchased from producers and the kind and amount of dairy products manufactured. The greater part of the data used in this study were obtained from these reports.

The annual reports filed at Jackson do not give the complete picture of commercial dairying in Mississippi, because all dairymen who retail their own milk and some of the smaller fluid milk plants do not file reports. In addition, the milk picked up on milk routes and hauled to fluid milk plants outside the

State does not appear in these reports. This means, of course, that fluid milk sales appear less important than they really are; however, for purposes of this report, this is not a limiting factor because this study is concerned primarily with the dairy manufacturing industry.

The number of manufacturing plants in operation and the amount of dairy products manufactured each year prior to 1919, as well as the date of opening of the early manufacturing plants, were obtained from the annual reports of the Dairy Specialist of the Mississippi Extension Service. Additional information was obtained from manufacturing plants, the United States Census, and various divisions of the U. S. Department of Agriculture.

Definition of Terms

Manufacturing plants: creameries, cheese plants, condenseries, and concentrated by-products plants. All plants manufacturing butter, cheese, and condensed milk were counted as separate plants even though they were operated in the same building in a few instances. Concentrated by-products plants were not considered as separate plants unless the by-products manufactured made up a predominate part of all products manufactured.

Dairy plants: manufacturing plants plus fluid milk and ice cream plants.

Butterfat manufactured: butterfat manufactured into butter, cheese, and condensed milk.

Condensery: plants producing condensed or evaporated whole milk. Condensed milk is the term used to designate both condensed and evaporated whole milk.

Fluid milk: includes milk and sweet cream sold for direct consumption.

DAIRY FARMING IN MISSISSIPPI

Dairying as a major farm enterprise is relatively undeveloped in Mississippi as compared to some of the more concentrated dairy areas of the United States. For example, Mississippi has less than one-half as many milk cows per square mile as the middle Atlantic and the east north central states;

milk produced per farm amounts to only about one-fifth that of the above states; and only about one-third the milk produced in Mississippi is sold as whole milk or cream, as compared to more than eight-tenths of the milk produced in the states mentioned above. See table 1.

From 1899 to 1939, Mississippi's relative position in the production of milk in the United States remained about the same. In 1899, Mississippi ranked 23rd among the 48 states in the amount of milk produced, and produced 1.34 percent of all the milk in the United States; by 1939, Mississippi ranked 24th in milk production and produced 1.31 percent of all milk produced, a slight deterioration of position on both counts. However, as far as milk sales are concerned, Mississippi's relative position has improved considerably. In 1939, Mississippi ranked 25th in the amount of milk sold, and sold 0.73 percent of all the milk sold in the United States, as compared to a rank of 41 in the amount of milk sold and 0.10 percent of total United States milk sales in 1899. See table 2.

With regard to their relative contributions to farm income, dairy products have doubled in importance in Mississippi since the middle twenties. The proportion of cash farm income, excluding government payments, that comes from the sale of dairy products increased from 3.3 percent for the period 1924-28 to 7.4 percent for the period 1937-39, then decreased slightly to 6.0 percent for the period 1942-44.

Table 1. Dairying in Mississippi compared with other sections of the United States, 1939

Area	Milk cows per square mile	Milk produced per cow milked	Milk produced per farm reporting cows milked	Percent of milk produced that is sold as milk and cream
	Number	Pounds	Pounds	Percent
United States	7.4	4,515	21,224	75.7
New England	11.1	5,246	41,607	84.5
Middle Atlantic	21.9	5,607	48,564	88.1
East North Central	22.5	5,022	33,041	87.5
West North Central	11.2	4,145	25,293	80.5
South Atlantic	6.0	3,767	8,729	40.4
East South Central	10.0	3,285	7,680	37.0
West South Central	5.7	3,414	11,060	46.9
Mountain	0.9	5,040	24,252	72.3
Pacific	3.6	6,244	46,380	85.9
Mississippi	9.6	2,838	6,742	30.6

Table 2. Mississippi's rank among the 48 states in milk produced and sold, and the percent Mississippi's milk production and sales are of the United States total, 1899-1939

Year	Milk produced		Milk sold	
	Mississippi's rank among the 48 states	Percent of total United States production	Mississippi's rank among the 48 states	Percent of total United States sales
1899	23	1.34	41	0.10
1909	26	1.29	42	0.10
1919	27	1.13	41	0.16
1924	29	.97	38	0.27
1929	24	1.18	30	0.64
1934	22	1.31	(1)	(1)
1939	24	1.31	25	0.73

Source: United States Census, 1900-1940.

(1) Data not available.

The number of milk cows and heifers, 2 years old and over, on farms as of January 1 decreased each year from 475,000 in 1920 to 408,000 in 1927, then increased each year to 595,000 head in 1935. This is an increase of 120,000 head or 26 per cent over 1920. After 1935, the number on farms declined each year until 1941 when 525,000 head were reported. Under the impetus of the war the number of milk cows and heifers on farms increased rapidly to 591,000 in 1944, only slightly less than the peak of 595,000 head in 1935. See table 3.

In 1939, 34.1 percent of the farms in Mississippi reported no milk cows; 60.3 percent reported from 1 to 4 milk cows, and only 5.6 percent reported 5 or more milk cows. This last group of farms had 34.5 percent of milk cows in Mississippi and produced 36.5 percent of all milk in the State. From a commercial standpoint this group is even more important because they sold 86.5 percent of milk and 72.6 percent of the cream marketed in the State. Thus it would appear that only

Table 3. Milk cows and heifers, 2 years old and over, on farms, Mississippi, 1920-1944

Year	Milk cows and heifers <i>thous.</i>	Year	Milk cows and heifers <i>thous.</i>	Year	Milk cows and heifers <i>thous.</i>	Year	Milk cows and heifers <i>thous.</i>	Year	Milk cows and heifers <i>thous.</i>
1920	475	1925	425	1930	440	1935	595	1940	541
1921	451	1926	412	1931	468	1936	553	1941	525
1922	446	1927	408	1932	510	1937	547	1942	551
1923	437	1928	412	1933	550	1938	547	1943	579
1924	433	1929	425	1934	581	1939	547	1944	591

Source: Livestock, Meats and Wool Market Statistics and Related Data, 1941, AMA, USDA, 1942; and reports of the BAE, 1943-1944.

Table 4. Number of cows milked and the proportion of milk produced and dairy products sold by farms reporting different size herds, Mississippi, 1939

Cows milked	Percent of farms	Percent of all cows milked	Percent of all milk produced	Percent of all whole milk sold	Percent of all cream sold
None	34.1	----	----	----	----
1 - 4	60.3	65.5	63.5	13.5	27.4
5 and above	5.6	34.5	36.5	86.5	72.6
State	100.0	100.0	100.0	100.0	100.0

Source: United States Census, 1940.

about one farm out of eighteen is of much importance as far as commercial dairy production is concerned. See table 4.

Although dairying is relatively undeveloped for the State as a whole, there are certain areas within the State where dairying has been developed to a considerable extent. In 1939 there were 20.2 milk cows per square mile in the lower Northeast Mississippi Milkshed Area and 18.1 milk cows per square mile in the Upper Northeast Mississippi Milkshed Area. See table 5. These figures compare rather favorably with the 21.9 and 22.5 milk cows per square mile in the Middle Atlantic and East North Central States, which are the most concentrated dairy states in the nation. Cows milked per square mile in the other important milkshed areas are as follows: 13.1 in the Upper Brown Loam; 10.8 in Central Mississippi, and 8.4 in Southwest Mississippi. See figure 1 for the location of the various milkshed areas.

As shown above, the greater part of the milk and cream sold in Mississippi is produced on farms with five or more cows. A breakdown of the size of herds by areas shows that the

Table 5. Cows milked per square mile and the percent of farms having specified numbers of cows, by areas, Mississippi, 1939

Milkshed area	Cows milked per square mile	Percent of farms having		
		No cows	1 - 4 cows	5 cows and above
Upper Northeast Mississippi	18.1	12.7	75.7	11.6
Lower Northeast Mississippi	20.2	25.6	57.5	16.9
Upper Brown Loam	13.1	30.4	62.8	6.8
Central Mississippi	10.8	23.5	70.4	6.1
Southwest Mississippi	8.4	26.7	66.1	7.2
Other areas	6.2	45.4	52.5	2.1
Mississippi	9.6	34.1	60.3	5.6

Source: United States Census.

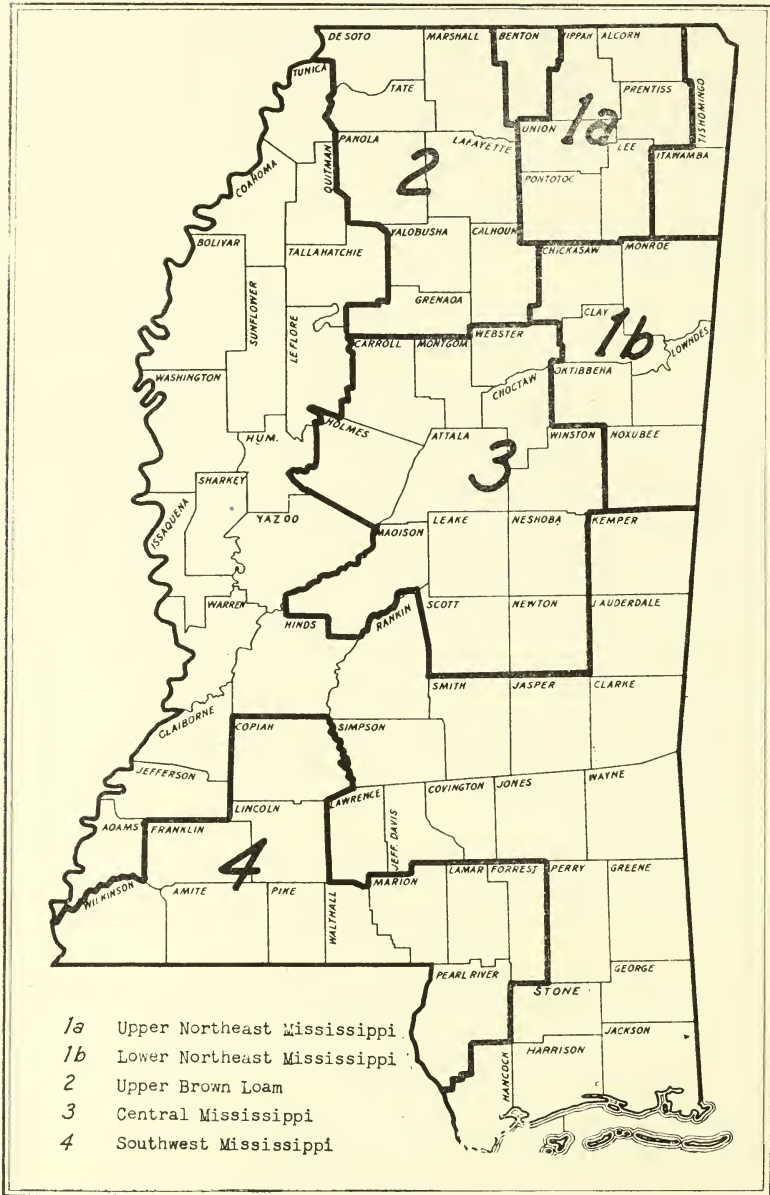


Figure 1. Important milkshed areas, Mississippi, 1914.

herds with five cows or more are concentrated in the Upper and Lower Northeast Mississippi Milkshed Areas to a greater extent than in any of the other areas. See table 5. The Upper Northeast Mississippi Milkshed Area has the smallest percentage of farms with no cows, 12.7 percent as compared to from 23.5 to 30.4 percent for the other milkshed areas.

HISTORICAL DEVELOPMENT OF DAIRY MANUFACTURING PLANTS¹

Commercial dairy production, other than small amounts of fluid milk around towns, did not get started in Mississippi until after the boll weevil came in and played havoc with cotton production for several years. The boll weevil infestation began to get serious about 1908 or 1909, and within a few years farmers were looking for other sources of income to supplement their decreased cotton income. It was during this period that the dairy industry began to develop in Mississippi.

There is some doubt as to which of two creameries should be accorded the distinction of being the first dairy manufacturing plant in the State. A cooperative creamery was organized at Brookhaven in 1909 but closed soon after. This plant was reopened for business in May 1913 by private management, but, in the meantime, the A & M Cooperative Creamery at A & M College, Starkville, Mississippi, had been opened for business in September 1912. It would be correct and probably satisfactory to all concerned to say that the first creamery was established at Brookhaven but that the first creamery to continue operation was established at State College.

The location of other early creameries and the date each started operation is as follows: Macon, July 1913; Meridian, October 1, 1914; West, October 16, 1914; Jackson, November, 1914; Okolona, 1914 or 1915; Aberdeen, and a second creamery at Brookhaven, 1915; and McComb, Sumrall, Tupelo, Water Valley, Durant, and Lexington, 1916. By 1919, 24 creameries were in operation and the number in operation remained at about this level until 1926 when the first condensery was opened at Starkville. The condensery at Starkville was soon followed by condenseries at Tupelo in 1927 and at Macon and Kosciusko in 1928.

¹See figures 2, 3, and 4 for shifts in the type and location of plants and figure 5 for the location of plants that have gone out of business or been replaced by plants using more of the total milk solids.

Cheese plants were the last of the three major types of dairy manufacturing plants to begin operating in Mississippi. The first cheese plant in Mississippi of which record is available was opened at Yazoo City in July 1927; however, an inadequate volume of milk was available and this plant was forced to close soon after opening. Kraft Cheese Company opened plants at Durant and Louisville in September and November of 1927. Cheese plants were opened at Billups, Montrose, Houston, Philadelphia, Columbus, Winona, Water Valley, Olive Branch, Indianola, West, Aberdeen, and McComb, in 1928. The cheese plants in the last three towns were opened in connection with creameries that were already operating. Most of the early cheese plants had difficulty in securing volume enough to operate at a profit; 7 of the first 15 cheese plants to open for business were closed in less than a year and only 3 are still operating today. In addition, a cheese plant was re-established in one of the above towns a few years after the original plant closed.

The number of plants manufacturing dairy products increased from 26 in 1926 to 39 in 1928 as a result of the establishment of cheese plants and condenseries. The number of manufacturing plants reached a peak in 1932 and 1933 when 45 plants were in operation. Since that time, the number in operation has declined until there were only 29 operating in 1943 and 31 in 1944. The decline in the number of creameries accounts for most of the decrease in plants during this period. As will be shown later in the section on prices, creameries cannot pay as much per pound of butterfat in cream as cheese plants and condenseries can pay for butterfat in milk. This has resulted in creameries going out of business in most areas where they were in direct competition with cheese plants or condenseries. Figures 4 and 5 show cheese plants or condenseries now operating in towns or counties where creameries have gone out of business. See Appendix table 1 for the number and type of plants in operation by years.

BUTTERFAT PURCHASED FROM PRODUCERS²

The amount of butterfat purchased by dairy manufacturing plants has increased, period by period, since the first plant was

²The amount of butterfat purchased from producers has been converted to pounds of milk equivalent for the benefit of those who are more interested in whole milk than butterfat. See column 5 of tables 6 and 7. However, the result will be essentially the same, regardless of which measure of volume is used in discussing the trend in purchases. Tables 2 and 3 in the Appendix give the purchases of butterfat or milk equivalent by years.

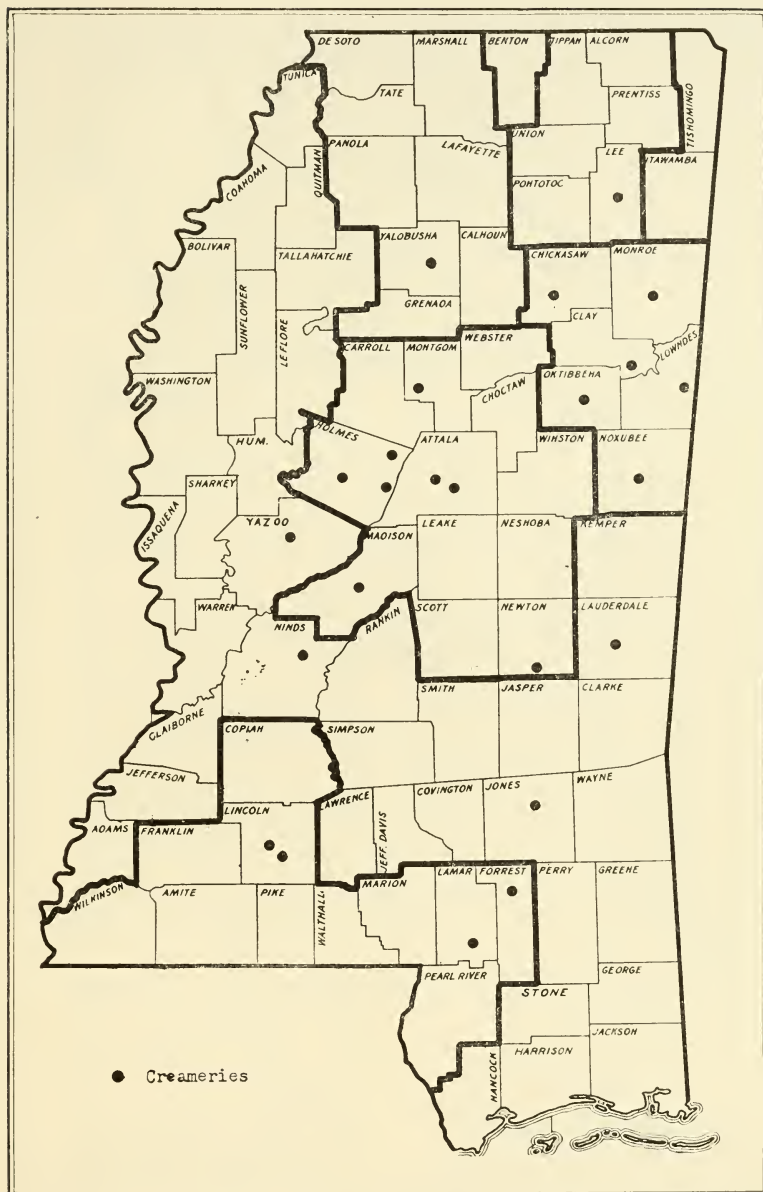


Figure 2. Location of plants manufacturing dairy products, Mississippi, 1919.

(Note: Four cream buying stations and four milk cooling stations were operating in 1919, but their locations are not available.)

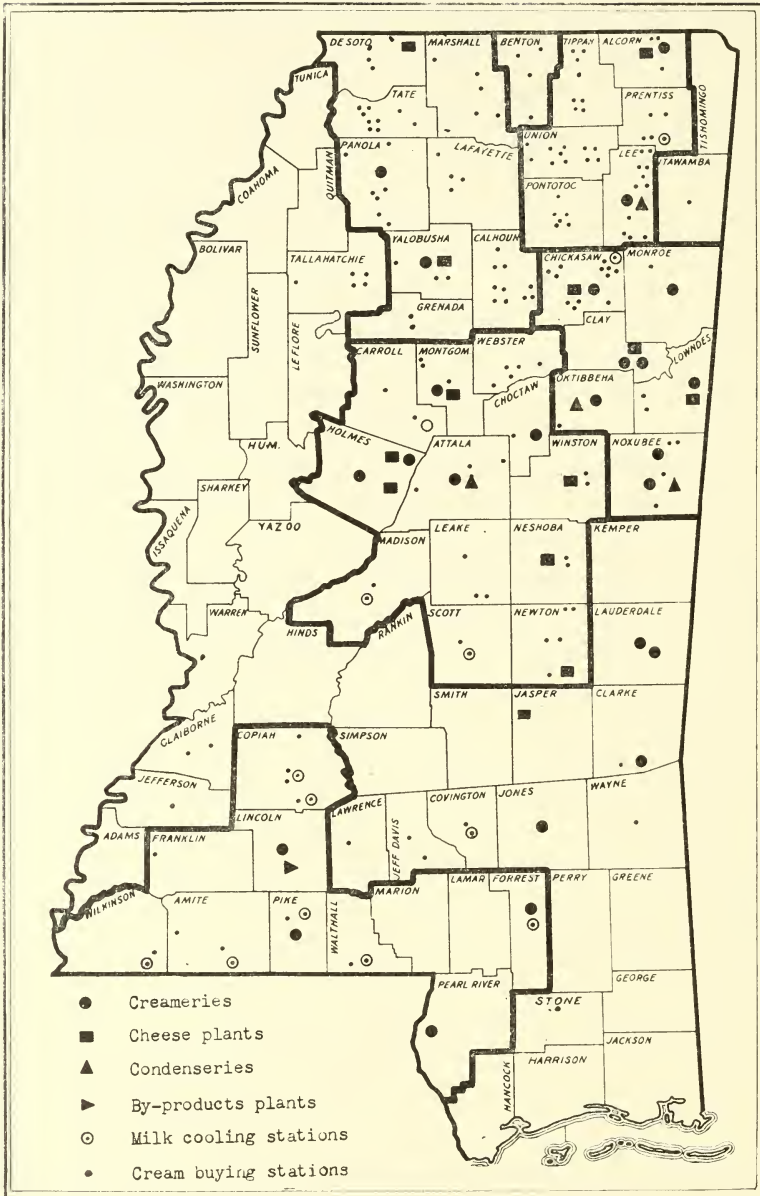


Figure 3. Location of plants manufacturing dairy products, and cooling and cream buying stations, Mississippi, 1929.

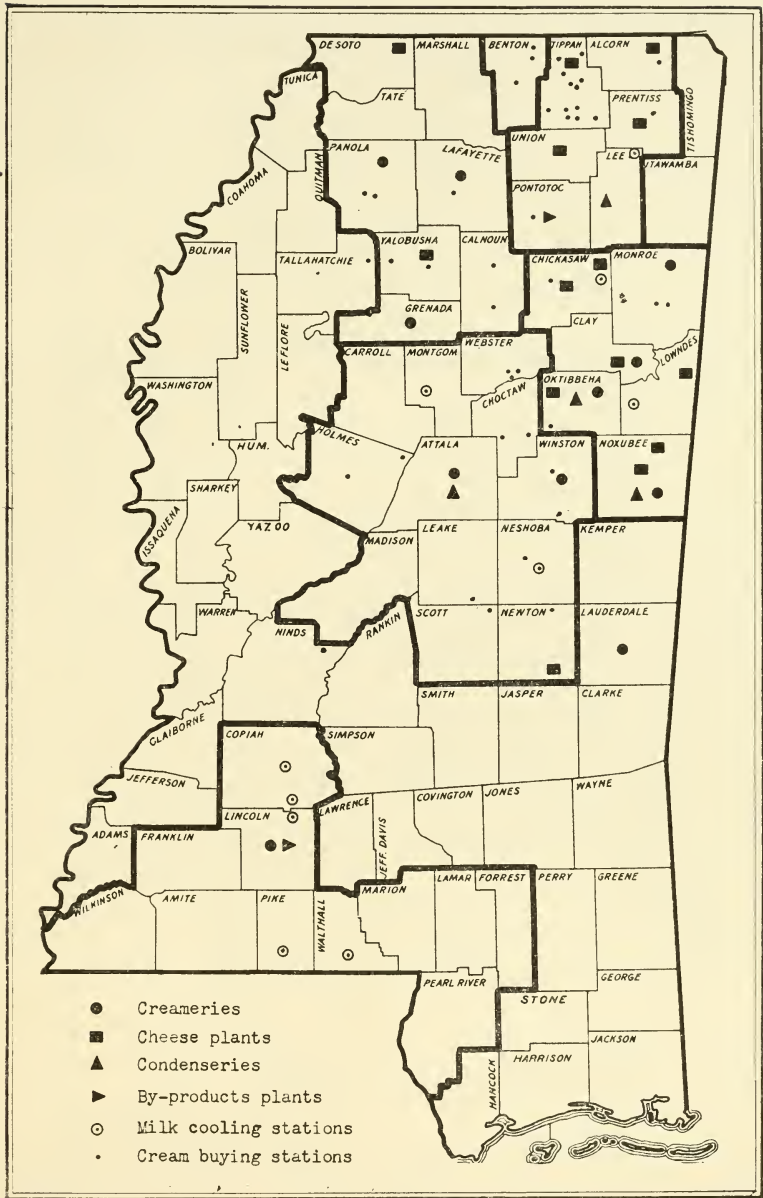


Figure 4. Location of plants manufacturing dairy products, and cooling and cream buying stations, Mississippi, 1944.

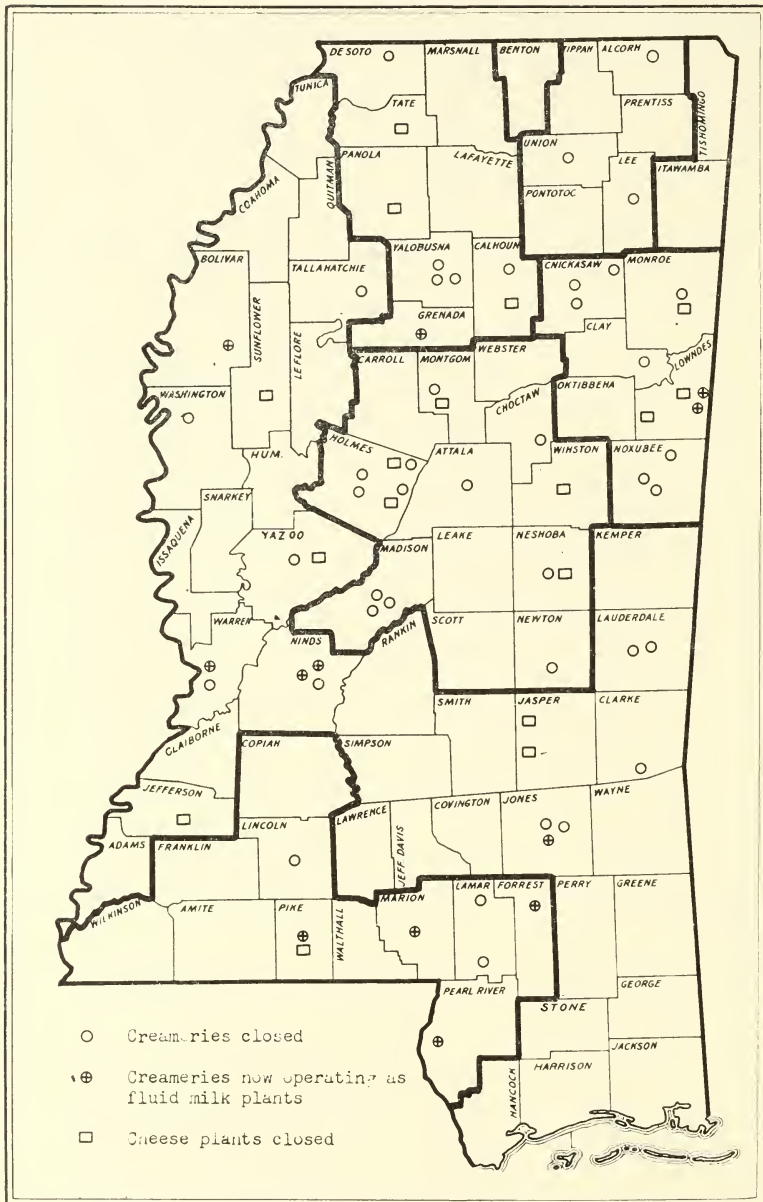


Figure 5. Location of plants that have discontinued the manufacture of dairy products, Mississippi, 1912-1944.

established in 1912. See table 6. The butterfat purchased from producers reached an annual average of 3,096,000 pounds in the 2-year period 1919-20, and increased rapidly thereafter to an average of 11,172,000 pounds in the 4 years ending with 1932. After 1932, purchases continued to increase, though at a slower rate, to 13,997,000 pounds per year in the period 1941-44. The amount of butterfat purchased per year increased 8,076,000 pounds between 1919-20 and 1929-32 and 2,825,000 pounds between 1929-32 and 1941-44. Thus, the absolute rate of increase was only about one-third as great after 1932.

The above figures do not, however, tell the whole story as to the increase in butterfat purchased after 1932. The amount of butterfat purchased by all dairy plants (manufacturing plants plus fluid milk and ice cream plants) increased from 12,361,000 pounds per year for the period 1929-32 to 17,359,000 pounds for the period 1941-44, an increase of 4,998,000 pounds. See table 7. In other words, the amount of butterfat purchased by all dairy plants increased 40 percent between 1929-32 and 1941-44 as compared to an increase of 25 percent for manufacturing plants. The decrease in the proportion of milk and cream going to manufacturing plants during the war period was caused by the unusually heavy demand for fluid milk and ice cream, which in turn was brought about by the establishment of army camps in Mississippi and the increase in income among the low-income families. Manufacturing plants purchased 81 percent of butterfat bought by all dairy plants during the period 1941-44 as compared to 90 percent for the period 1929-32.

Table 6. Pounds of milk and butterfat purchased by dairy manufacturing plants, Mississippi, 1919-1944

Period	Average per year					Percent of butterfat purchased in milk
	Pounds of milk purchased	Pounds of butterfat purchased in milk	Pounds of butterfat purchased in cream	Total pounds of butterfat purchased	Total pounds of milk or its equivalent purchased	
	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	
1919-1920	6,184	289	2,807	3,096	71,471	9.3
1921-1924	13,005	591	5,271	5,862	135,580	10.1
1925-1928	61,484	2,864	5,953	8,817	199,935	32.5
1929-1932	150,515	6,821	4,351	11,172	251,712	61.1
1933-1936	177,541	8,066	3,766	11,833	265,132	68.2
1937-1940	225,364	10,116	3,083	13,198	297,055	76.6
1941-1944	261,007	11,709	2,288	13,997	314,216	83.7

Source: Table 2, Appendix.

Table 7. Pounds of milk and butterfat purchased by all dairy plants reporting, Mississippi, 1929-1944

Period	Average per year					Percent of butterfat purchased in milk
	Pounds of milk purchased <i>thous.</i>	Pounds of butterfat purchased in milk <i>thous.</i>	Pounds of butterfat purchased in cream <i>thous.</i>	Total pounds of butterfat purchased <i>thous.</i>	Total pounds of milk or its equivalent purchased <i>thous.</i>	
1929-1932	168,103	7,663	4,698	12,361	277,348	62.0
1933-1936	198,357	9,004	4,282	13,286	297,943	67.7
1937-1940	254,976	11,480	3,348	14,828	332,836	77.4
1941-1944	328,303	14,760	2,599	17,359	388,739	85.0

Source: Table 3, Appendix.

The 40 percent increase in the amount of butterfat purchased by all dairy plants between 1929-32 and 1941-44 was the result of a 73 percent increase in the number of patrons selling butterfat and a 19 percent decrease in the amount of butterfat sold per patron. The number of patrons selling butterfat increased, period by period, from 22,603 per year for the period 1929-32 to 39,036 per year for the period 1941-44. The amount of butterfat sold per patron decreased from 574 pounds per year during the period 1929-32 to 410 pounds per year during the period 1937-40, then increased slightly to 445 pounds per year during the next 4-year period. See table 8. It is likely that the increased production per patron during 1941-44 was the result of higher prices and the heavy pressure put on farmers by the government to produce more milk.

Whole milk is becoming relatively more and more important in the manufacture of dairy products in Mississippi. The per-

Table 8. Number of patrons, butterfat sold per patron, and total pounds of butterfat purchased by dairy plants, Mississippi, 1929-1944

Period	Average per year		
	Patrons selling butterfat ¹	Pounds of butterfat sold per patron ²	Total pounds of butterfat purchased by dairy plants <i>thous.</i>
1929-1932	22,603	547	12,361
1933-1936	26,972	493	13,286
1937-1940	36,200	410	14,828
1941-1944	39,036	445	17,359

Source: Computed from annual report of dairy plants, 1929-1944, Mississippi Department of Agriculture and Commerce; the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi; and a survey of dairy plants, 1945.

¹Computed by dividing the pounds of butterfat sold per patron into the total pounds of butterfat purchased by dairy plants.

²Based on a sample of plants. The amount of milk or its equivalent purchased by the sample plants varied from 20 percent of the total for the period 1937-1940 to 34 percent of the total for the period 1941-1944.

cent of total butterfat purchased by manufacturing plants that was purchased in milk, increased from 10 percent for the period 1921-24, when butter was the only product manufactured, to 33 percent for the period 1925-28, when condenseries and cheese plants first began operating. Milk purchases more than doubled during the next 4-year period, while the amount of butterfat purchased in cream declined by 27 percent. This caused the amount of butterfat purchased in milk to jump to 61 percent of the total, almost twice the percentage for the preceding period. The amount of milk purchased continued to increase and the amount of butterfat purchased in cream continued to decrease each period until 84 percent of all butterfat purchased by manufacturing plants was purchased in whole milk during the last 4-year period. Butterfat in milk brings a price considerably higher than butterfat sold in cream and, for this reason, most farmers living on or close to milk routes sell whole milk.

BUTTERFAT MANUFACTURED

The amount of butterfat manufactured into dairy products increased in much the same manner as the amount of milk or its equivalent purchased by manufacturing plants, with the exception that the amount of butterfat manufactured from 1941 to 1944 decreased 0.8 percent as compared to the preceding 4-year period. See table 9. As already mentioned, the unusually heavy demand for fluid milk and ice cream has caused many plants to sell considerable quantities of fluid milk and sweet cream during the war period. These plants were forced to do this from a profit standpoint because butterfat can be sold for a higher profit per pound in fluid milk and sweet cream than in manufactured form.

Table 9. Pounds of butterfat manufactured, Mississippi, 1912-1944

Period	Average pounds of butterfat manufactured per year	Increase over preceding period	Percent increase over preceding period
1912-1916	418,704	-----	-----
1917-1920	2,450,027	2,031,323	485.2
1921-1924	5,083,920	2,633,893	107.5
1925-1928	7,048,088	1,964,168	38.6
1929-1932	9,893,541	2,845,453	40.4
1933-1936	10,350,674	457,133	4.6
1937-1940	11,121,903	771,229	7.45
1941-1944	11,031,280	— 90,623	— 0.8

Source: Table 4, Appendix.

SOLIDS NOT FAT MANUFACTURED

The amount of solids not fat utilized by dairy manufacturing plants in Mississippi was negligible until after 1926 when condenseries and cheese plants first began operating. Up to that time, most of the solids not fat in the milk from which butterfat was used in manufacturing butter were retained on farms in the form of skim milk. During the period 1929-32, the solids not fat retained on farms in the form of skim milk amounted to only 36 percent of the total in milk sold as whole milk and cream. Both the absolute and relative amount of solids not fat retained on farms have continued to decrease to the present time. Only 14 percent of the total solids not fat in milk sold as whole milk and cream was retained on farms in the form of skim milk during the period 1941-44. See table 10.

The amount of solids not fat manufactured in cheese, condensed milk, and concentrated by-products, averaged 8,066,000 pounds per year during the period 1929-32 and 15,584,000 pounds per year during the period 1941-44. This is an increase of 93 percent. The fact that the amount of butterfat manufactured only increased 11 percent during this same period further emphasizes the increasing importance of solids not fat in the manufacture of dairy products in Mississippi.

Table 10. Pounds of solids not fat manufactured, retained on farms, and total in milk sold as whole milk and cream, Mississippi, 1929-1944

Period	Average per year		
	Solids not fat manufactured <i>thous.</i>	Solids not fat retained on farms in skim milk <i>thous.</i>	Total solids not fat in milk sold as whole milk and cream <i>thous.</i>
1929-1932	8,066	8,958	24,823
1933-1936	9,955	8,166	26,666
1937-1940	13,370	6,385	29,789
1941-1944	15,584	4,956	34,792

Source: Computed from annual reports of dairy plants, Mississippi Department of Agriculture and Commerce, 1929-1944; and the annual summaries of dairy products, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

VOLUME PER PLANT MANUFACTURING DAIRY PRODUCTS

Volume per plant manufacturing dairy products has increased continuously, with one exception, since the first successful plant was established in 1912. Plants operating in the period

1929-32 had a smaller volume than the plants operating in the preceding period. See table 11. The annual volume of butterfat manufactured per plant increased from 60,000 pounds for the period 1912-16 to 226,000 pounds for the period 1929-32, and 347,000 pounds for the period 1941-44. That is, the amount of butterfat manufactured per plant increased 166,000 pounds or 276 percent between 1912-16 and 1929-32, and 121,000 pounds or 54 percent between 1929-32 and 1941-44. When the amount of butterfat purchased from producers is considered, volume per plant has increased even more since 1932. The amount of butterfat purchased from producers per plant increased from 255,000 pounds per year for the period 1929-32 to 441,000 pounds for the period 1941-44, an increase of 186,000 pounds or 73 percent.

Although the number of plants manufacturing dairy products decreased 27 percent between 1929-32 and 1941-44, the volume of butterfat purchased per plant increased enough (73 percent) to bring about a 13 percent increase in the amount of butterfat purchased from producers. This trend toward a smaller number of plants with a larger volume will in all probability continue for sometime, because most plants in Mississippi, if not all, are operating at levels far below their most efficient volume. (See figure 8 for the relationships between capacity and volume handled at 12 plants in 1944.)

Table 11. Plants manufacturing dairy products, butterfat purchased from producers and manufactured, and the average amount of butterfat purchased and manufactured per plant, Mississippi, 1912-1944

Period	Average per year			Pounds of butterfat	
	Manu- facturing plants <i>number</i>	Pounds of butterfat purchased <i>thous.</i>	Pounds of butterfat manu- factured <i>thous.</i>	Purchased per plant <i>thous.</i>	Manu- factured per plant <i>thous.</i>
1912-1916	7	.....	419	.....	60
1917-1920	23	.....	2,450	.....	108
1921-1924	24	5,862	5,084	242	210
1925-1928	30	8,817	7,048	291	232
1929-1932	44	11,172	9,894	255	226
1933-1936	41	11,833	10,351	287	251
1937-1940	39	13,198	11,122	343	289
1941-1944	32	13,997	11,031	441	347

Source: Appendix tables 1, 2, and 4.

DAIRY PRODUCTS MANUFACTURED

Butter

The number of creameries in operation increased rapidly from 1 in 1912 to 24 in 1919, then remained at about this level throughout the Twenties. The number of creameries reached a peak in 1932 and 1933 when 28 plants operated; since that time, the number operating has decreased until only 11 plants reported the manufacture of butter in 1944. The amount of butter manufactured reached a peak of 8,884,000 pounds in 1932, then declined to 4,491,000 pounds in 1944, about one-half as much. That is, both the number of creameries operating and the amount of butter manufactured decreased after 1932. See figure 6.

The number of creameries operating, the amount of butter manufactured, and the volume manufactured per plant was calculated by 4-year periods in order to smooth out the yearly fluctuations (caused by climatic conditions) and, consequently, to smooth out the trend in the above items. When this was done, it was found that the number of creameries and the total amount of butter manufactured increased, period by period,

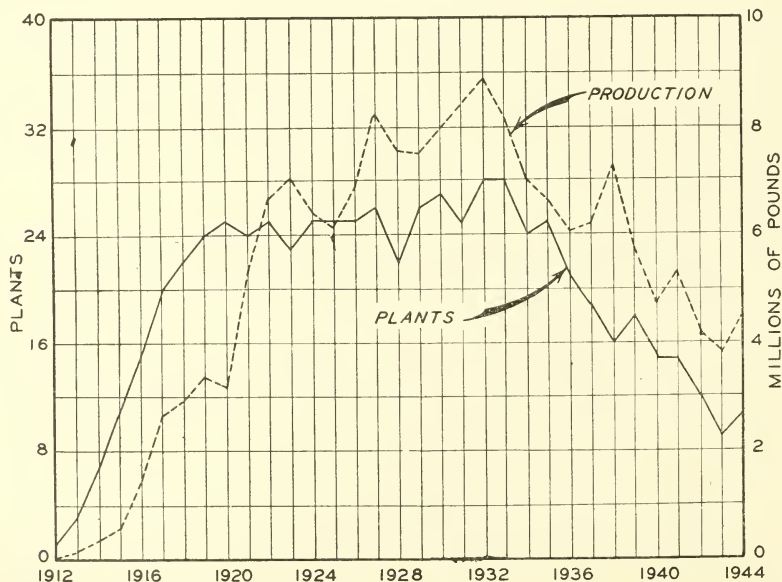


Figure 6. Number of creameries reporting and pounds of butter manufactured, Mississippi, 1912-1944.

Table 12. Number of creameries, butter manufactured, and butter manufactured per plant, by periods, Mississippi, 1912-1944

Period	Average per year		Pounds of butter manufactured per plant <i>thousands</i>
	Creameries	Pounds of butter manufactured	
	<i>number</i>	<i>thousands</i>	
1912-1916	7	520	74
1917-1920	23	3,030	133
1921-1924	24	6,355	262
1925-1928	25	7,209	294
1929-1932	27	7,376	278
1933-1936	25	6,961	284
1937-1940	17	6,013	354
1941-1944	12	4,454	379

Source: Tables 1 and 4 in the appendix.

through 1929-32, then decreased, period by period, thereafter. The volume manufactured per plant increased through the period 1925-28, decreased slightly the next two periods, then continued to increase to the present. See table 12. Between 1929-32 and 1941-44, the number of creameries operating decreased 56 percent, the volume manufactured per plant increased 36 percent, and total amount of butter manufactured decreased 40 percent.

Competition among creameries for butterfat became rather intense during the Twenties and this led to the indiscriminate establishment of cream buying stations throughout the important milk producing areas. During this period, practically 100 percent of the cream buying stations were company-owned and as many as five different stations were operated in the same town in some instances. The number of cream buying stations increased from 4 in 1919 to a peak of 180 in 1930, then decreased gradually to 104 in 1939. The number in operation has decreased rapidly during the war; only 46 were operated in 1944 and only 5 of these were company-owned stations.

Cheese

Cheese plants in Mississippi were established rapidly after the first three plants opened in 1927. The number of cheese plants increased to 13 the next year and the number in operation has not exceeded or fallen short of this total by more than 4 plants since that time. Fourteen plants have manufactured cheese in each of the last 4 years. The amount of cheese manufactured increased from 198,000 pounds in 1927

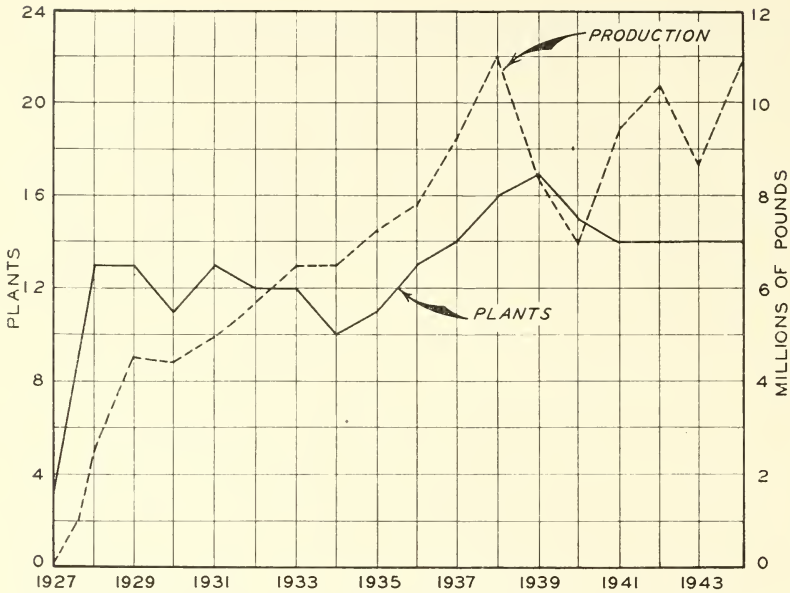


Figure 7. Number of cheese plants reporting and pounds of cheese manufactured, Mississippi, 1927-1944.

and 2,531,000 pounds in 1928 to a peak of 11,006,000 pounds in 1938. Production in 1944 amounted to 10,969,000 pounds or 0.3 percent less than in 1938. See figure 7.

Although more cheese was manufactured in 1938 than in any other year, a combination of the years into groups shows that 982,000 pounds or 11 percent more cheese was manufactured per year during the period 1941-44 than during the period 1937-40. See table 13. In fact, the amount of cheese manufactured per year has increased, period by period, since

Table 13. Number of cheese plants, cheese manufactured, and cheese manufactured per plant, by periods, Mississippi, 1927-1944

Period	Average per year		Pounds of cheese manufactured per plant thousands
	Cheese plants number	Pounds of cheese manufactured thousands	
1927-1928	8	1,364	171
1929-1932	12	4,905	400
1933-1936	12	7,013	610
1937-1940	16	8,932	576
1941-1944	14	9,914	708

Source: Tables 1 and 4 in the appendix.

cheese plants were first established. Although the number of cheese plants operating increased only slightly between 1929-32 and 1941-44, the volume manufactured per plant increased to such an extent (77 percent) that total cheese production more than doubled (an increase of 102 percent).

Condensed milk

The number of condenseries operating in Mississippi increased from one in 1926 to two in 1927 and to four in 1928, where it has since remained. Condenseries require considerably more milk for efficient operation than cheese plants; this, no doubt, has limited their number. The amount of condensed milk manufactured increased from 17 million pounds per year for the period 1926-28 to 51 million pounds for the period 1941-44. The amount of condensed milk manufactured and, consequently, the volume per plant, almost doubled (90 percent increase) between 1929-32 and 1941-44. See table 14.

Table 14. Pounds of condensed milk manufactured by periods, Mississippi, 1926-1944

Period	Average pounds of condensed milk manufactured per year	Increase over preceding period	Percent increase over preceding period
1926-1928	16,734,957	.....	....
1929-1932	26,907,947	10,172,990	60.79
1933-1936	30,240,556	3,332,609	12.39
1937-1940	42,123,787	11,883,231	39.30
1941-1944	51,114,988	8,991,201	21.34

Source: Appendix table 4.

Concentrated by-products

Concentrated by-products have become of more and more importance in the dairy industry in Mississippi. Between 1929-32 and 1941-44, the amount of condensed skimmed milk manufactured increased from 2,013,000 pounds per year to 4,686,000 pounds per year; the amount of non-fat dry milk solids increased from 602,000 pounds per year to 1,635,000 pounds per year, and the amount of dried buttermilk manufactured decreased from 396,000 pounds per year to 286,000 pounds per year. That is, two and one-third times as much condensed skimmed milk, two and three-fourths as much non-fat dry milk solids, and seven-tenths as much dried buttermilk were man-

Table 15. Pounds of concentrated by-products manufactured and pounds of skim milk in all concentrated by-products, Mississippi, 1929-1944

Period	Average per year			
	Sweetened condensed and plain condensed or evaporated skim milk	Non-fat dry milk solids	Dried butter-milk	Skim milk in all concentrated by-products ¹
	<i>thousands</i>	<i>thousands</i>	<i>thousands</i>	<i>thousands</i>
1929-1932	2,013	602	396	13,784
1933-1936	1,418	1,370	339	21,133
1937-1940	2,490	1,857	299	30,141
1941-1944	4,682	1,635	286	34,834

Source: Annual reports of dairy plants, 1929-1944, Mississippi Department of Agriculture and Commerce, and the annual summaries of Dairy Production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

¹Computed.

ufactured in the period 1941-44 as in the period 1929-32. The amount of skimmed milk manufactured into concentrated by-products amounted to 35 million pounds per year for the period 1941-44, two and one-half times the 14 million pounds manufactured per year for the period 1929-32. See table 15.

FLUID MILK SALES AND ICE CREAM PRODUCED

Fluid milk sales remained at approximately the same level from the period 1929-32 through the period 1937-40, then almost tripled the next 4-year period. The amount of fluid milk or its equivalent sold per year increased from 29 million pounds for the period 1937-40 to 81 million pounds for the period 1941-44. The number of plants selling fluid milk increased from 24 to 31 during the same period. See table 16.

Table 16. Number of ice cream plants, gallons of ice cream made, plants selling fluid milk for direct consumption, and pounds of milk or its equivalent sold as fluid milk or sweet cream for direct consumption, Mississippi, 1929-1944

Period	Average per year			
	Plants manufacturing ice cream mix	Gallons of ice cream manufactured	Plants selling fluid milk for direct consumption	Pounds of milk or its equivalent sold as fluid and sweet cream for direct consumption ¹
	<i>number</i>	<i>thousand</i>	<i>number</i>	<i>thousand</i>
1929-1932	35	959	27	27,511
1933-1936	31	1,038	28	28,005
1937-1940	27	1,319	24	28,986
1941-1944	24	2,751	31	81,054

Source: Annual reports of dairy plants, 1929-1944, Mississippi Department of Agriculture and Commerce; and the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

¹Computed as milk with 4.5 percent butterfat. Includes fluid milk shipped to plants in other states by plants in Mississippi.

The amount of ice cream manufactured increased slowly from 959,000 gallons per year for the period 1929-32 to 1,319,000 gallons per year for the period 1937-40. The amount of ice cream manufactured jumped to 2,751,000 gallons per year for the period 1941-44, an increase of over 100 percent. No attempt was made to tabulate the increase in the number of establishments manufacturing (or freezing) ice cream because of the tremendous increase in counter freezers during the past few years. However, the number of plants manufacturing ice cream mix decreased from 35 per year for the period 1929-32 to 24 per year for the period 1941-44.

The tremendous increase in fluid milk and ice cream sales during the period 1941-44 was the direct result of the war which caused army camps to be located in Mississippi and the income of low-income families to increase. It is likely that fluid milk and ice cream sales in Mississippi will return to approximately their pre-war levels after the war, unless the income of the people of Mississippi, especially low income groups can be maintained at levels considerably higher than in pre-war years.

RELATIVE IMPORTANCE OF DAIRY PRODUCTS

Butter, condensed milk, and cheese, in the order named, were the most important dairy products manufactured in Mississippi between 1929 and 1932. Since that time, butter has declined in volume and condensed milk and cheese increased until both condensed milk and cheese rank ahead of butter in importance, with condensed milk ranking first. In arriving at the relative importance of the various dairy products, the solids not fat manufactured into each product were taken into consideration as well as the butterfat util-

Table 17. Percentage of total butterfat purchased from producers that was used in various dairy products, by periods, Mississippi, 1929-1944

Period	Butter	Condensed milk	Cheese	Fluid milk	Ice cream	Other uses	Total
1929-1932	48.25	17.57	14.22	10.02	4.16	5.79	100.00
1933-1936	42.14	18.40	17.37	9.49	5.53	7.08	100.00
1937-1940	32.56	23.05	19.39	8.80	6.91	9.28	100.00
1941-1944	20.59	23.71	19.25	21.01	9.78	5.66	100.00

Source: Annual reports of dairy plants, 1929-1941, Mississippi Department of Agriculture and Commerce; and the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

Table 18. Percentage of total solids not fat in milk sold as whole milk and cream that is used in various dairy products, Mississippi, 1929-1944

Period	Cheese	Con- densed milk	Ice cream	Fluid milk	Concen- trated by- products	Retained on farms in skimmed milk	Other uses or waste	Total
1929-1932	5.92	20.38	1.97	9.92	6.18	36.09	19.54	100.00
1933-1936	7.89	21.64	1.98	9.40	7.80	30.62	20.67	100.00
1937-1940	9.00	26.55	2.26	8.71	9.34	21.43	22.71	100.00
1941-1944	8.55	27.27	4.03	20.85	8.97	14.24	16.09	100.00

Source: Computed from annual reports of dairy plants, 1929-1941, Mississippi Department of Agriculture and Commerce, and the annual summaries of dairy production, 1938-1940, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

ized. See table 17 and 18. Concentrated by-products and ice cream were also relatively more important between 1941 and 1944 than between 1929 and 1932.

Between 1929-32 and 1937-40, fluid milk sales became relatively less important; however, under the impetus of the war, fluid milk sales increased greatly. Fluid milk sales ranked below butter, condensed milk, and cheese in importance between 1929 and 1932, but only slightly below condensed milk between 1941 and 1944. If fluid milk sales not reported³ were taken into account, fluid milk sales would probably rank first in importance during the war period, 1941-44. However, after the war, fluid milk sales will likely decline to some extent.

DEVELOPMENT BY AREAS⁴

Plants manufacturing dairy products have become more and more concentrated in the Northeast Mississippi Milkshed Area. Seven dairy manufacturing plants out of the 24 in Mississippi were operating in the Northeast Mississippi Milkshed Area in 1919; 17 out of 44 in 1929, and 19 out of 31 in 1944. That is, 61 percent of the plants manufacturing dairy products were located in this Area in 1944, as compared to 38 percent in 1929 and 29 percent in 1919. Thirteen creameries and three cheese plants have gone out of business in this Area; however, cheese plants or condenseries are operating in all towns where creameries have gone out of business. At least one manufacturing plant is located in each county of this Area.

On the basis of the amount of butterfat purchased from

³Some of the smaller fluid milk plants and all of the many dairymen who retail their own milk do not file reports as to production and sales.

⁴See figure 2, 3, and 4 for shifts in the type and location of plants, and figure 5 for the location of plants that have gone out of business or been replaced by plants using more of the total milk solids. Tables 5 and 6 in the Appendix give the amount of butterfat purchased in each area by years.

Table 19. Pounds of butterfat purchased from producers by plants manufacturing dairy products, by areas, Mississippi, 1916-1944

Period	Milkshed Area						Other areas <i>thous.</i>	State <i>thous.</i>
	Lower N. E. Missis- sippi	Upper N. E. Missis- sippi	N. E. Missis- sippi	Upper Brown Loam	Central Missis- sippi	S. W. Missis- sippi		
	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>		
1916-1920	971	67	1,088	55	527	492	414	2,526
1921-1924	2,360	324	2,684	287	1,014	948	928	5,861
1925-1928	3,408	870	4,278	445	1,001	1,264	1,829	8,817
1929-1932	4,537	1,324	5,861	898	1,819	1,243	1,351	11,172
1933-1936	5,140	1,996	7,136	942	1,515	931	1,309	11,833
1937-1940	6,058	2,955	9,013	1,151	1,521	744	769	13,198
1941-1944	6,028	3,923	9,951	822	1,750	580	894	13,997

Source: Appendix table 5.

producers, this Area has become even more important in the dairy manufacturing industry in Mississippi. The amount of butterfat purchased from producers has increased both absolutely and relatively, period by period, to the present time. See tables 19 and 20. Manufacturing plants in this Area purchased 71 percent of the butterfat purchased by all manufacturing plants in Mississippi for the period 1941-44, as compared to 53 percent for the period 1929-32, and 41 percent for the period 1916-20.

Although the Northeast Mississippi Milkshed Area is a continuous area, the development in the upper and lower parts has been quite different. The lower part of the Area developed earlier and at a more rapid rate than the upper part of the Area through the period 1929-32, whereas, the upper part of the Area has developed at a faster rate since that time. The number of manufacturing plants operating in the lower part of the Area increased from 6 in 1919 to 13 in 1929, and 13 in 1944; the number operating in the upper part of the Area increased from 1 in 1919 to 4 in 1929, and 6 in 1944. The amount of butterfat purchased from producers per year by manufacturing plants increased 1,257,000 pounds in the upper and 3,566,000 pounds in the lower part of the Area between 1916-20 and 1929-32; between 1929-32 and 1941-44, the amount of butterfat purchased from producers per year increased 2,599,000 pounds in the upper and 1,491,000 pounds in the lower part of the Area. In other words, the lower part of the Area developed about three times as fast as the upper part through the period 1929-32, but only about one-half as fast after that time.

The upper part of the Northeast Mississippi Milkshed Area has increased its relative importance, period by period, from

Table 20. Percentage of total butterfat purchased from producers by plants manufacturing dairy products that was purchased in each important milkshed area, Mississippi, 1916-1944

Period	Milkshed area						Other areas	State
	Lower N. E. Missis-sippi	Upper N. E. Missis-sippi	N. E. Missis-sippi	Upper Brown Loam	Central Missis-sippi	S. W. Missis-sippi		
1916-1920	38.4	2.7	41.1	2.2	20.8	19.5	16.4	100.0
1921-1924	40.3	5.5	45.8	4.9	17.3	16.2	15.8	100.0
1925-1928	38.6	9.9	48.5	5.1	11.4	14.3	20.7	100.0
1929-1932	40.6	11.9	52.5	8.0	10.3	11.1	12.1	100.0
1933-1936	43.4	16.9	60.3	8.0	12.8	7.9	11.0	100.0
1937-1940	45.9	22.4	68.3	8.7	11.5	5.7	5.8	100.0
1941-1944	43.2	28.1	71.3	5.7	12.5	4.1	6.4	100.0

Source: Table 19.

3 percent of the total butterfat purchased by manufacturing plants for the period 1916-20 to 28 percent for the period 1941-44. In contrast, the lower part of the Area has been able to increase its relative position only slightly, from 38 percent of the total for the period 1916-20 to 43 percent of the total for the period 1941-44.

The number of manufacturing plants in the Upper Brown Loam Area increased from one in 1919 to four in 1929, and five in 1944. Six creameries and three cheese plants have gone out of business in this Area. Manufacturing plants that have gone out of business in three counties of this Area have not been replaced. The amount of butterfat purchased from producers per year increased from 55,000 pounds for the period 1916-20 to 1,151,000 pounds for the period 1937-40, and then decreased to 822,000 pounds for the period 1941-44. The decrease in the amount of butterfat purchased by manufacturing plants in this Area during the war period is probably the result of more milk being trucked into Memphis to satisfy the increased demand of its wartime population for fluid milk.

The Upper Brown Loam Area increased in relative importance in the manufacture of dairy products up through the period 1937-40, then decreased to some extent during the next 4-year period. Manufacturing plants in this Area purchased 2 percent of the butterfat purchased by Mississippi manufacturing plants during the period 1916-20, 9 percent during the period 1937-41, and 6 percent during the period 1941-44.

It is likely that the amount of butterfat purchased by manufacturing plants in this Area will resume its upward trends after the war. This will be true if the demand for fluid milk

should fall off in this Area and the milk thus released returned to manufacturing plants.

The number of plants manufacturing dairy products in the Central Mississippi Milkshed Area increased from 8 in 1919 to 12 in 1929, then decreased to 4 by 1944. That is, one-third of the plants manufacturing dairy products in Mississippi were operating in this Area in 1919 as contrasted to about one-fourth in 1929 and one-eighth in 1944. Twelve creameries and five cheese plants have discontinued operating in this area. Manufacturing plants that have gone out of business in five counties have not been replaced; however, milk cooling stations are operated in two of these counties.

The dairy industry got an early start in the Central Mississippi Area, but failed to develop as rapidly and to as great an extent as the State as a whole. In fact, this Area reached its peak production during the period 1929-32. The amount of butterfat purchased by manufacturing plants increased from 527,000 pounds per year for the period 1916-20 to 1,819,000 pounds for the period 1929-32, then decreased to 1,750,000 pounds for the period 1941-44. Relatively speaking, this Area has declined in importance since the period 1916-20. Plants in this Area purchased 21 percent of all butterfat purchased by manufacturing plants in Mississippi during the period 1916-20; by the time this Area had reached its peak production during the period 1929-32, this percentage had declined to 16. Only 13 percent of all butterfat purchased by manufacturing plants in Mississippi was purchased by plants in the Area during the period 1941-44.

Four plants manufactured dairy products in the Southwest Mississippi Milkshed Area in 1919, five in 1929, and two in 1944. Eight creameries and one cheese plant have discontinued manufacturing dairy products. Plants manufacturing dairy products that have gone out of business in six counties have not been replaced with manufacturing plants; however, fluid milk plants and milk cooling stations which supply fluid milk to New Orleans, army camps, and local towns are operating in four of these counties.

The amount of butterfat purchased from producers by manufacturing plants increased from 492,000 pounds per year for the period 1916-20 to 1,264,000 pounds per year for the period

1925-28, then decreased to 580,000 pounds per year for the period 1941-44. In terms of its relative importance in the manufacture of dairy products, this area has declined, since the period 1916-20. Plants in the area purchased 20 percent of all butterfat purchased by manufacturing plants in Mississippi during the period 1916-20, 14 percent during the period 1925-28, and 4 percent during the period 1941-44.

The Southwest Mississippi Area has become predominately a fluid milk area and to get a correct picture of its dairying, the amount of butterfat purchased by fluid milk and ice cream plants must be added to the amount purchased by manufacturing plants. When this was done, it was found that butterfat purchased by all dairy plants in the Area decreased from 1,443,000 pounds per year for the period 1929-32 to 1,284,000 pounds per year for the period 1937-40; however, production has been stimulated by the increased wartime demand for fluid milk and the amount of butterfat purchased by all dairy plants amounted to 2,247,000 pounds per year during the period 1941-44, an increase of 75 percent over the preceding 4-year period. Plants in the Area purchased 13 percent of the total butterfat purchased by all dairy plants in Mississippi during the period 1941-44 as compared to 9 percent for the period 1937-40, and 12 percent for the period 1929-32. See tables 21 and 22. Thus, the purchases of butterfat for fluid milk purposes have increased to such an extent that the butterfat purchased by all dairy plants amounted to over 50 percent more for the period 1941-44 than for the period 1929-32, although the amount of butterfat purchased by manufacturing plants had decreased by over 50 percent during the same period.

Table 21. Pounds of butterfat purchased from producers by all dairy plants reporting by areas, Mississippi, 1929-1944

Period	Milkshed area						Other areas <i>thous.</i>	State <i>thous.</i>
	Lower North-east Miss. <i>thous.</i>	Upper North-east Miss. <i>thous.</i>	North-east Miss. <i>thous.</i>	Upper Brown Loam <i>thous.</i>	Central Miss. <i>thous.</i>	South-west Miss. <i>thous.</i>		
1929-1932	4,655	1,324	5,979	942	1,829	1,443	2,168	12,361
1933-1936	5,314	1,996	7,310	993	1,515	1,336	2,132	13,286
1937-1940	6,243	2,964	9,207	1,189	1,522	1,284	1,626	14,828
1941-1944	6,294	3,951	10,245	862	1,750	2,247	2,255	17,359

Source: Appendix table 6.

Table 22. Percentage of total butterfat purchased from producers by all dairy plants that was purchased in each important milkshed area, Mississippi, 1929-1944

Period	Milkshed area						Other areas	State
	Lower North-east Miss.	Upper North-east Miss.	North-east Miss.	Upper Brown Loam	Central Miss.	South-west Miss.		
1929-1932	37.7	10.7	48.4	7.6	14.8	11.7	17.5	100.0
1933-1936	40.0	15.0	55.0	7.5	11.4	10.1	16.0	100.0
1937-1940	42.1	20.0	62.1	8.0	10.3	8.6	11.0	100.0
1941-1944	36.2	22.8	59.0	5.0	10.1	12.9	13.0	100.0

Source: Derived from table 12.

The amount of butterfat purchased by all dairy plants in the Southwest Area may again take up the downward trend that was in evidence before the war. In all probability, many producers who have gone into or expanded milk production during the wartime period on the basis of fluid milk prices, will find that they cannot profitably produce lower priced milk for manufacturing purposes if the wartime fluid milk markets decline in importance.

SEASONAL VARIATION IN MILK AND BUTTERFAT PURCHASES

Due to the seasonal variation in milk production, the amount of milk and butterfat purchased by dairy plants varied greatly during the various months. Monthly milk purchases varied

Table 23. Seasonal variation in the amount of milk and butterfat purchased by dairy plants, Mississippi, 1929-1944

Months	Percent of annual volume purchased each month					
	Milk			Butterfat		
	1929-1936	1937-1944	1929-1944	1929-1936	1937-1944	1929-1944
January	4.84	4.68	4.75	5.30	5.13	5.20
February	4.91	4.94	4.93	5.10	5.14	5.12
March	6.10	6.15	6.13	6.03	6.08	6.06
April	9.22	8.88	9.03	8.71	8.38	8.53
May	12.45	12.50	12.48	11.75	11.81	11.78
June	11.80	11.78	11.79	11.06	11.05	11.05
July	11.93	12.11	12.03	11.26	11.43	11.36
August	11.33	11.58	11.47	11.00	11.25	11.14
September	8.89	9.08	9.00	9.03	9.22	9.14
October	7.53	7.42	7.47	8.21	8.09	8.15
November	6.01	5.90	5.95	6.91	6.79	6.84
December	4.99	4.98	4.98	5.64	5.63	5.63
Year	100.00	100.00	100.00	100.00	100.00	100.00

Source: Computed from annual reports of dairy plants, 1929-1937, Mississippi Department of Agriculture and Commerce; and the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

from 4.8 percent of the annual volume in January to 12.5 percent in May for the 16-year period 1929-44; monthly butterfat purchases varied from 5.1 percent of the annual volume in February to 11.8 percent in May during the same period. To further emphasize the concentration of milk and butterfat purchases during the summer months, it should be pointed out that 48 percent of the milk and 45 percent of the butterfat is purchased in the 4 months of May, June, July and August. That is, almost one-half the volume of milk and butterfat is purchased in one-third of the year. See table 23.

Butterfat purchases are not concentrated in the summer months to as great an extent as milk purchases because the butterfat content of milk is at its lowest level during the summer months. The butterfat content of milk varied from a low of 4.22 percent in June to 5.18 percent in November, and averaged 4.50 percent for the year during the period 1938-44. See table 24.

Plants could operate more efficiently if they obtained a greater percentage of their volume during the winter months, and consequently, they could afford to pay higher prices for milk if this were the case. Much time and effort have been spent trying to persuade the farmers to produce more feed and to feed heavier during the winter months with the idea of producing a greater part of the annual volume during the winter months. In order to determine if any progress has been made in increasing the proportion of milk and butterfat purchased during the winter months, the 16-year period 1929-44 was divided into two 8-year periods, 1929-36, and 1937-44, and the percentage of milk and butterfat purchased each month

Table 24. Butterfat content of milk, by months, Mississippi, 1938-1944

Month	1938	1939	1940	1941	1942	1943	1944	Average
January	4.94	4.90	5.01	4.82	4.97	4.91	4.97	4.93
February	4.63	4.68	4.74	4.63	4.81	4.65	4.60	4.68
March	4.41	4.41	4.39	4.48	4.52	4.53	4.40	4.45
April	4.31	4.27	4.28	4.07	4.28	4.28	4.27	4.25
May	4.23	4.32	4.22	4.26	4.30	4.21	4.22	4.25
June	4.26	4.30	4.25	4.18	4.20	4.20	4.16	4.22
July	4.24	4.27	4.34	4.28	4.21	4.19	4.20	4.25
August	4.39	4.38	4.36	4.38	4.34	4.38	4.33	4.37
September	4.55	4.56	4.59	4.54	4.55	4.68	4.50	4.57
October	4.91	4.88	4.96	4.77	4.96	5.01	4.91	4.91
November	5.18	5.20	5.24	5.20	5.11	5.20	5.15	5.18
December	5.10	4.99	5.10	5.02	5.15	5.12	5.17	5.09
Year	4.48	4.50	4.54	4.49	4.52	4.52	4.46	4.50

Source: Computed from annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

calculated for both periods. The division of the data in this manner showed that the proportion purchased each month had not changed materially, but that what little change there had been was in the opposite direction from what plant managers would like. A slightly smaller percentage of milk and butterfat was purchased in the winter months of November to February and a slightly higher percent in the summer months of May to August during the period 1937-44 than during the period 1929-36. See table 23.

The tremendous difference in the volume of milk or its equivalent purchased by dairy plants in the winter months as compared to the summer months is brought about by a decline in the number of patrons selling milk as well as a decline in the amount of milk or its equivalent sold per patron; however, the decline in the amount of milk sold per patron is greater than the decline in the number of patrons. For example, between May and January, the high and low months in volume, the number of patrons selling milk or cream decreased 34 percent; the amount of milk or its equivalent sold per patron decreased 42 percent, with the result that the amount of milk or its equivalent purchased by dairy plants decreased 62 percent. See table 25.

The concentration of milk production in the summer months has resulted in about one-half the dairy products in Missis-

Table 25. Relative number of patrons, milk or its equivalent sold per patron, and total milk or its equivalent purchased by dairy plants, by months, Mississippi, 1929-1944

Month	Relatives (May = 100)		
	Number of patrons	Milk or its equivalent sold per patron	Milk or its equivalent purchased by dairy plants
January	66	58	38
February	67	60	40
March	69	71	49
April	83	87	72
May	100	100	100
June	102	92	94
July	100	96	96
August	99	93	92
September	93	77	72
October	88	68	60
November	82	59	48
December	74	54	40

Source: Computed from annual reports of dairy plants, 1929-1944, Mississippi Department of Agriculture and Commerce; and a survey of dairy manufacturing plants, 1945.

sippi being manufactured in the 4-month period, May-August, and about two-thirds in the 6-month period April-September. Fifty-two percent of the cheese manufactured in Mississippi between 1938 and 1944 was manufactured in the 4-month period, May-August, and 69 percent in the 6-month period, April-September; 44 percent and 63 percent of the condensed milk and 45 percent and 62 percent of the butter were manufactured during the same periods. See Appendix table 7.

Relation of Seasonal Production to Plant Capacity and Efficiency of Operation

In order to determine the extent of capacity at which dairy manufacturing plants operated, the capacity and the amount of milk or its equivalent purchased each month were obtained for 12 manufacturing plants. The summarization of these data showed that these plants operated at about two-thirds of capacity during their peak month, at slightly less than one-fourth of capacity during the month in which their volume was lowest, and averaged operating at 45 percent of capacity for the year. Monthly deliveries at the plant which operated at the highest percentage of capacity for the year varied from 29 percent of capacity to over 100 percent of capacity for 2 months, and averaged 68 percent of capacity for the year. One other plant had deliveries exceeding capacity for 2 months. Monthly deliveries at the plant operating at the lowest percent of capacity for the year varied from 15 percent of capacity to 51 percent of capacity, and averaged 31 percent of capacity for the year. See figure 8.

The efficiency of operation at any plant is related directly to the percentage of capacity at which that plant operates. There are certain fixed charges such as upkeep of buildings and equipment, depreciation, interest on investment, and management cost that must be met regardless of whether the plant operates at 5 percent of capacity or 100 percent of capacity. It is readily apparent, therefore, that the cost of manufacturing a pound of cheese or of butter or condensed milk decreases continuously until the plant is operating at full capacity. It is impossible for dairy manufacturing plants to operate at 100 percent of capacity for the year because of the unavoidable variations in milk production; however, the nearer

they approach this ideal, the greater will be the opportunity to increase the efficiency of the milk plant operation.

If the volume of milk or its equivalent purchased by the 12 plants discussed above could be increased until they reached 100 percent of capacity during their peak months, they would operate at 68 percent of capacity for the year instead of 45 percent. Thus, their efficiency of operation for the year would be increased considerably, and this would just about represent maximum efficiency for the average manufacturing plant in Mississippi because of the seasonal variation in milk production.

The volume of milk or its equivalent purchased per manufacturing plant can be increased by (1) increasing total milk production or (2) decreasing the number of plants operating. As shown earlier in this report, both the above factors have been working since 1932 to increase the volume handled per manufacturing plant.

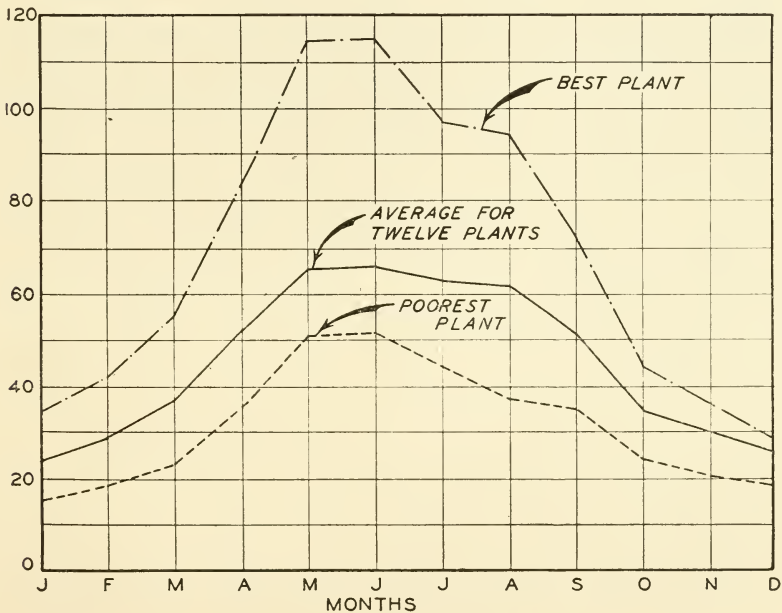


Figure 8. Percent monthly volume is of plant capacity, 12 dairy manufacturing plants, Mississippi, 1944.

Relation of Seasonal Variation in Milk Production to Efficiency of Milk Transportation

Due to the seasonal variation in milk production, the cost of transporting milk to manufacturing plants is approximately two and one-half times as great in the winter as in the summer months. The amount of milk hauled per mile by 79 milk routes averaged 22 pounds in January as compared to 53 pounds in June. The increase of 31 pounds in the amount of milk hauled per mile between January and June was the result of the number of patrons selling milk increasing from 1.46 to 2.20 per mile, and the amount of milk sold per patron per day increasing from 30 to 49 pounds. The number of patrons per mile, the milk sold per patron per day, and the amount of milk hauled per mile increased through June, then decreased thereafter. See figure 9.

Routes at two of the nine plants included in this study were run every other day during the winter months. These routes doubled their volume per mile over what it would have been if they had run every day, with the result that the vol-

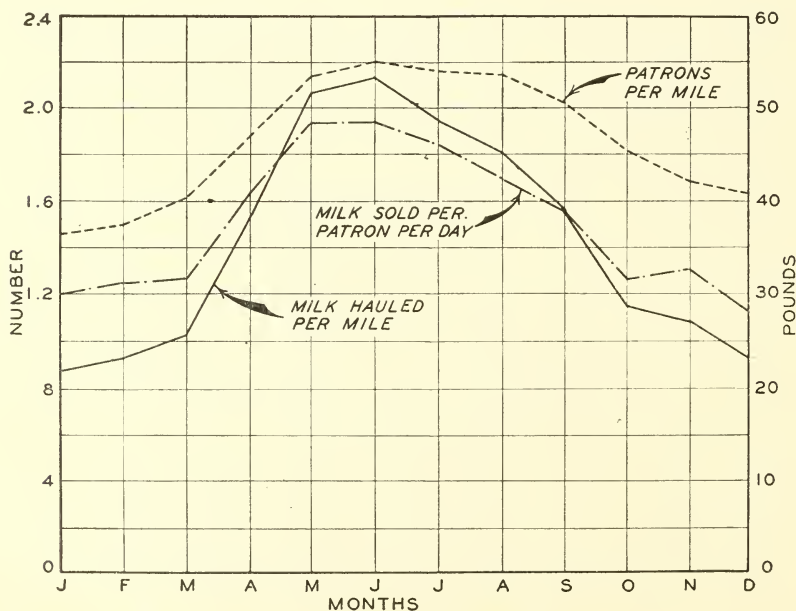


Figure 9. Patrons per mile, milk sold per patron per day and milk hauled per mile, by months, 79 milk routes, Mississippi, 1944.

ume hauled per mile during the winter months amounted to only slightly less than during the summer months.

The problem of transporting milk to manufacturing plants is more than a seasonal one because of the low annual volume hauled on many routes. The average amount of milk hauled per mile on the 79 routes studied amounted to 36.1 pounds per mile for 1944; however, the amount hauled on individual routes varied from as low as 12 pounds to as high as 98 pounds per mile for the year. Eight routes averaged hauling less than 20 pounds of milk per mile during 1944; 17 hauled from 20 to 30 pounds; 19 hauled from 30 to 40 pounds; 17 hauled from 40 to 50 pounds; 10 hauled from 50 to 60 pounds, and 8 hauled 60 pounds and above. It is interesting to note that both the patrons per mile and the amount of milk sold per patron increased consistently as the amount of milk hauled per mile increased. See table 26.

Table 26. Patron per mile, milk per patron per mile, milk hauled per mile, and length of routes in miles, 79 milk routes, Mississippi, 1944

Pounds of milk hauled per mile	Number of routes	Patron per mile	Milk per patron per day	Milk hauled per mile	Average length of routes in miles
Less than 20	8	1.12	31	16.8	63.8
20.0-29.9	17	1.42	36	24.9	66.2
30.0-39.9	19	1.88	40	34.5	57.2
40.0-49.9	17	2.20	43	45.5	53.6
50.0-59.9	10	2.54	44	54.7	61.5
60.0 and above	8	2.88	59	77.6	19.9
Total and average	79	1.86	39	36.1	55.8

Source: Survey of nine dairy manufacturing plants, 1945.

PRICES PAID PRODUCERS FOR MILK AND BUTTERFAT

Prices paid producers for milk and butterfat have varied considerably during the past 16 years. The price paid for 100 pounds of 4.5 percent milk varied from \$0.97 in 1932 to \$2.77 in 1944 at cheese plants; from \$0.98 in 1932 to \$3.07 in 1944 at condenseries, and from \$1.49 in 1932 to \$3.83 in 1944 at fluid milk plants. The price paid per pound of butterfat in cream varied from \$0.15 in 1932 to \$0.53 in 1944. In other words, cheese plants paid 2.9 times as much for milk in 1944 as 1932, condenseries, 3.1 times as much, and fluid milk plants, 2.6 times as much. Butterfat in cream sold for 3.5 times as much in 1944 as in 1932. If the government subsidy of \$0.40 to \$0.70 per hundred pounds for the production of milk and \$0.06

to \$0.17 per pound for the production of butterfat in cream were added to the amount paid by dairy plants, the increase in the prices paid producers between 1932 and 1944 would be even more pronounced.

From 1929 to 1944 fluid milk plants paid an average of 32.8 percent more per 100 pounds of 4.5 percent milk than condenseries; condenseries paid an average of 3.4 percent more per hundred pounds of 4.5 percent milk than cheese plants; and cheese plants paid an average of 24.3 percent more per pound of butterfat in milk than creameries and other plants paid per pound of butterfat in cream. See table 27.

Seasonal Variation in Prices

During the 3-year period, 1938-40, the actual price paid for milk at condenseries and cheese plants varied from 89 percent of the average annual price in June to 131 percent in December; however, when the monthly prices were adjusted to the price that would have been paid for 4.5 percent milk, it was found that the price varied from 95 percent of the average annual price in May, June, and August to 112 percent in January. Therefore, a considerable part of the seasonal variation

Table 27. Prices received by producers per hundred pounds of milk sold to cheese plants, condenseries and fluid milk plants, and per pound of butterfat in cream at all plants, Mississippi, 1929-1944

Year	Price paid per 100 pounds of milk at			Price paid per pound of butterfat in cream
	Cheese plants	Con-denseries	Fluid milk plants	
1929	\$2.39	\$2.27	\$2.99	\$0.44
1930	2.04	2.02	2.66	0.36
1931	1.35	1.37	2.10	0.22
1932	0.97	0.98	1.49	0.15
1933	1.08	1.11	1.61	0.18
1934	1.20	1.29	1.78	0.21
1935	1.43	1.47	1.98	0.24
1936	1.73	1.76	2.03	0.31
1937	1.74	1.76	2.13	0.31
1938	1.33	1.37	2.12	0.26
1939	1.34	1.39	2.15	0.25
1940	1.51	1.57	2.25	0.28
1941	2.08	2.02	2.49	0.36
1942	2.21	2.26	2.98	0.41
1943	2.68	3.04	3.61	0.52
1944	2.77	3.07	3.83	0.53
Average	1.74	1.80	2.39	0.31

Source: Annual reports of dairy plants, 1929-1944, Mississippi, Department of Agriculture and Commerce; and the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

in the actual prices paid for milk at cheese plants and condenseries is due to the seasonal change in the butterfat content of milk. See the upper part of figure 10. The shaded area in this figure shows the variation in price that is due to the seasonal change in the butterfat content of milk and the dotted line shows the true seasonal variation in price.

The increased demand for milk products during the war has resulted in the seasonal variation in prices being modified to some extent. The price paid for 4.5 percent milk at condenseries and cheese plants varied from 97 percent of the average annual price in June to 105 percent in December, a variation only about half as great as in the pre-war period, 1938-40. See the lower part of figure 10. Since the wartime period, 1942-44, is abnormal, the seasonal variation in prices that prevailed during the pre-war period, 1938-40, is the one most likely to prevail in the postwar period.

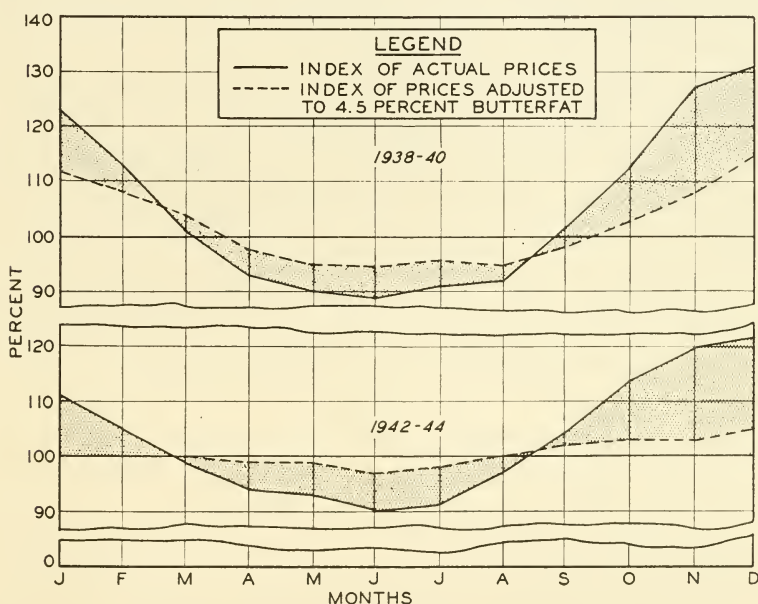


Figure 10. Index of seasonal variation in prices paid per hundred pounds of milk at cheese plants and condenseries, Mississippi, 1938-1940 and 1942-1944. (Average annual price-100).

Note: The shaded area represents the seasonal variation in price due to the seasonal variation in the butterfat content of milk.

The seasonal variation in the price of butterfat in cream is similar to that of milk purchased by cheese plants and condenseries; however, the seasonal variation in the prices paid for fluid milk is not nearly so great. During the period 1938-40, the price paid for 100 pounds of 4.5 percent milk varied from 97 percent of the average annual price in June to 105 percent in February, a variation only about one-half as great as for milk sold to cheese plants and condenseries. This is the result of fluid milk plants having a rather uniform market, both as to demand and price throughout the year.

The seasonal variation in price is related directly to the seasonal variation in production; that is, prices are lowest when the most milk is being sold and highest when milk sales are at their lowest point. In fact, the price paid per hundred pounds of milk at condenseries and cheese plants between 1938 and 1940 was below the average annual price in every month in which milk purchases were above average, and above the average annual price in every month in which milk purchases were below average. See figure 11.

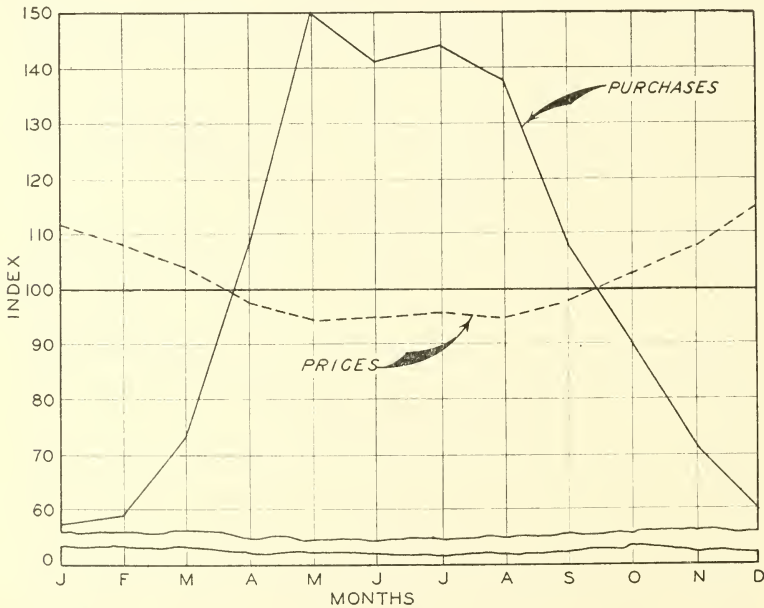


Figure 11. Relation of the index of seasonal purchases to the index of seasonal prices at cheese plants and condenseries, Mississippi. (Average monthly purchases 1929-1944=100. Average annual price, 1938-40, adjusted to 4.5 percent butterfat = 100.)

SUMMARY

Dairying as a major farm enterprise is relatively undeveloped in Mississippi as compared to some of the more concentrated dairy areas of the United States such as the Middle Atlantic and East North Central States. Although Mississippi's relative position in the production of milk in the United States has remained about the same for the last 40 years, her relative position in milk sales has increased considerably. With regard to their relative contribution to total farm income, dairy products have doubled in importance since the period 1924-28.

Commercial dairy production did not get started in Mississippi until after the boll weevil came in and played havoc with cotton production for several years. The boll weevil infestation began to get serious about 1908 or 1909; and the first creamery to continue operation was established at Mississippi A & M College (now Mississippi State College) in 1912. This creamery was followed by two others in 1913, four in 1914, two in 1915, and six in 1916. By 1919, 24 creameries were in operation and the number remained at about this level until the first condensery was established in 1926 and the first cheese plant in 1927. The number of manufacturing plants increased rapidly to 39 in 1928, then more slowly to a peak of 45 in 1932 and 1933. Since that time, the number in operation has declined until only 31 plants were in operation in 1944. The decline in the number of creameries, which cannot pay as much per pound of butterfat in cream as cheese plants and condenseries can pay per pound of butterfat in milk, accounts for most of the decrease in manufacturing plants during this period.

The amount of butterfat purchased by manufacturing plants has increased, period by period, since the first plant was established in 1912, although at a slower rate after 1932. The amount of butterfat purchased from producers increased from 3,096,000 pounds per year for the period 1913-20 to 11,172,000 pounds per year for the period 1929-32, and 13,997,000 pounds for the period 1941-44.

Relatively speaking, the amount of butterfat purchased by all dairy plants increased more between 1929-32 and 1941-44 than the amount purchased by manufacturing plants alone.

The amount of butterfat purchased by all dairy plants increased 40 percent between 1929-32 and 1941-44 as compared to an increase of 25 percent for manufacturing plants. The 40-percent increase in the amount of butterfat purchased by all dairy plants between 1929-32 and 1941-44 was the result of a 73 percent increase in the number of patrons selling butterfat and a 19 percent decrease in the amount of butterfat sold per patron.

Whole milk, and consequently solids not fat, is becoming relatively more and more important in the manufacture of dairy products in Mississippi. Manufacturing plants purchased 84 percent of their butterfat in milk during the period 1941-44 as compared to 10 percent for the period 1921-24. Solids not fat manufactured into dairy products increased 93 percent between 1929-32 and 1941-44 as compared to an increase of only 11 percent in the amount of butterfat manufactured.

Volume per manufacturing plant has continued to increase since the first plant was established. The annual volume of butterfat manufactured per plant increased from 60,000 pounds for the period 1912-20 to 226,000 pounds for the period 1928-32, and 347,000 pounds for the period 1941-44. The volume of butterfat purchased per manufacturing plant increased enough (73 percent) between 1929-32 and 1941-44 to bring about a 25 percent increase in the amount of butterfat purchased from producers, although the number of manufacturing plants had decreased 27 percent during the same period.

Since the period 1929-32, butter has become relatively less important, and condensed milk, cheese and concentrated by-products more important in the dairy industry in Mississippi. The amount of butter manufactured decreased 40 percent between 1929-32 and 1941-44, as compared to an increase of 90, 102, and 150 percent, respectively, in the manufacture of condensed milk, cheese, and skim milk products.

During the last four years, 1941-44, an average of 51,000,000 pounds of condensed milk, 9,914,000 pounds of cheese, 4,454,000 pounds of butter, 4,682,000 pounds of condensed skimmed milk, and 1,635,000 pounds of non-fat dry milk solids were manufactured per year.

The dairy manufacturing industry has become more and more concentrated in the 12 counties comprising the Northeast Mississippi Milkshed Area. Plants in this Area purchased

71 percent of the butterfat purchased by manufacturing plants in Mississippi for the period 1941-44 as compared to 53 percent for the period 1929-32, and 41 percent for the period 1916-20.

The Central Mississippi, Southwest Mississippi, and Upper Brown Loam Milkshed Areas have all declined in relative importance in dairy manufacturing; however, fluid milk production has increased to a considerable amount in the last two Areas.

Due to the seasonal variation in milk production, dairy plants purchase approximately one-half their annual volume in the 4 months of May to August and about one-fifth their annual volume during the 4 months of November to February. The tremendous difference in the volume of milk or its equivalent purchased by dairy plants in the winter months as compared to the summer months is brought about by a decline in the number of patrons selling milk or cream, as well as a decline in the amount sold per patron. There was no material change in the seasonal variation in milk production in the 16 years from 1929-44.

The seasonal variation in milk production affects the percentage of capacity at which plants operate and, consequently, their efficiency of operation. In 1944, a sample of the manufacturing plants (12) operated at about two-thirds of capacity during their peak month, at slightly less than one-fourth of capacity during the month in which their volume was lowest, and averaged operating at 45 percent of capacity for the year as compared to 31 percent for the poorest plant.

Due to the seasonal variation in milk production, the per unit cost of transporting milk to manufacturing plants is approximately two and one-half times as great in the winter as in the summer months; however, the problem of transporting milk to manufacturing plants is more than a seasonal one because of the low annual volume hauled on many routes.

Fluid milk plants pay more for milk than condenseries, condenseries pay more than cheese plants, and cheese plants pay more for butterfat in milk than creameries pay for butterfat in cream. Prices paid for milk and cream vary directly with seasonal productions; that is, prices are lowest when production is highest and prices highest when production is lowest.

APPENDIX

Table 1. Plants manufacturing dairy products, Mississippi, 1912-1944

Year	Creameries	Condenseries	Cheese plants	Concentrated by-products plants	Total plants
1912	1	----	----	----	1
1913	3	----	----	----	3
1914	7	----	----	----	7
1915	9	----	----	----	9
1916	15	----	----	----	15
1917	20	----	----	----	20
1918	22	----	----	----	22
1919	24	----	----	----	24
1920	25	----	----	----	25
1921	24	----	----	----	24
1922	25	----	----	----	25
1923	23	----	----	----	23
1924	25	----	----	----	25
1925	25	----	----	----	25
1926	25	1	----	----	26
1927	26	2	3	----	31
1928	22	4	13	----	39
1929	26	4	13	7	44
1930	27	4	11	7	43
1931	25	4	13	7	43
1932	28	4	12	7	45
1933	28	4	12	7	45
1934	24	4	10	7	39
1935	25	4	11	6	41
1936	21	4	13	7	40
1937	19	4	14	7	39
1938	16	4	16	8	38
1939	18	4	17	8	41
1940	15	4	15	8	36
1941	15	4	14	6	35
1942	12	4	14	5	32
1943	9	4	14	6	29
1944	11	4	14	6	31

Source: "Growth of the Dairy Industry in Mississippi from 1912 to 1922," by L. A. Higgins, Dairy Specialist, Mississippi Extension Service; and the annual reports of dairy plants, 1919-1944, Mississippi Department of Agriculture and Commerce.

Table 2. Pounds of milk and cream purchased by dairy manufacturing plants, Mississippi, 1919-1944¹

Year	Milk purchased <i>thous.</i>	Butterfat in milk <i>thous.</i>	Butterfat purchased in cream <i>thous.</i>	Total butterfat purchased <i>thous.</i>	Total milk equivalent ¹ <i>thous.</i>	Percent of butterfat purchased in milk
1919	5,665	265	2,909	3,174	73,313	8.4
1920	6,703	311	2,706	3,017	69,630	10.3
1921	11,628	521	4,373	4,894	113,339	10.6
1922	10,607	485	5,531	6,016	139,222	8.1
1923	11,105	505	5,881	6,386	147,888	7.9
1924	18,681	853	5,297	6,150	141,870	13.9
1925	21,210	985	5,283	6,268	144,070	15.7
1926	40,730	1,888	5,715	7,603	173,635	24.8
1927	77,960	3,651	6,673	10,324	233,160	35.4
1928	106,034	4,932	6,142	11,074	248,877	44.5
1929	142,039	6,420	5,293	11,713	265,138	54.8
1930	137,036	6,152	3,925	10,077	228,330	61.0
1931	150,860	6,914	3,712	10,626	237,188	65.1
1932	172,126	7,797	4,475	12,272	276,194	63.5
1933	172,527	7,785	4,858	12,643	285,512	61.6
1934	170,310	7,719	3,729	11,448	257,046	67.4
1935	169,892	7,854	3,323	11,177	247,175	70.3
1936	197,435	8,908	3,155	12,063	270,796	73.8
1937	230,488	10,324	3,160	13,484	303,971	76.6
1938	270,756	12,111	3,611	15,722	254,729	77.0
1939	215,412	9,692	3,097	12,789	287,441	75.8
1940	184,799	8,335	2,463	10,798	242,078	77.2
1941	239,805	10,814	2,770	13,584	304,218	79.6
1942	258,991	11,616	2,482	14,098	316,716	82.4
1943	243,493	10,978	1,991	12,969	289,806	84.6
1944	301,738	13,429	1,909	15,338	346,124	87.6

Source: Annual reports of dairy plants, 1919-1937, Mississippi Department of Agriculture and Commerce; and the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

¹Pounds of whole milk purchased plus the milk equivalent of butterfat purchased as cream. The milk equivalent of cream was calculated by dividing the butterfat purchased in cream by 4.3 and multiplying by 100. It was estimated that a 0.2 pounds of the average 4.5 pounds of butterfat in 100 pounds of milk was left in the skim milk on the average farm.

Table 3. Pounds of milk and cream purchased by all dairy plants reporting, Mississippi, 1929-1944

Year	Milk purchased <i>thous.</i>	Butterfat in milk <i>thous.</i>	Butterfat purchased in cream <i>thous.</i>	Total butterfat purchased <i>thous.</i>	Total milk equivalent ¹ purchased <i>thous.</i>	Percent of butterfat purchased in milk
1929	156,999	7,096	5,839	12,935	292,777	54.9
1930	151,108	6,992	4,143	11,135	247,453	62.8
1931	171,774	7,864	3,887	11,751	262,167	66.9
1932	192,531	8,700	4,922	13,622	306,997	63.9
1933	187,496	8,454	5,489	13,943	315,155	60.6
1934	187,190	8,493	4,306	12,799	287,332	66.4
1935	194,197	8,917	3,709	12,626	280,440	70.6
1936	224,547	10,152	3,625	13,777	308,847	73.7
1937	260,351	11,710	3,553	15,263	342,982	76.7
1938	296,004	13,259	3,784	17,043	383,990	77.8
1939	241,657	10,883	3,374	14,257	320,116	76.3
1940	221,894	10,069	2,681	12,750	284,256	79.0
1941	304,348	13,665	3,041	16,706	375,066	81.8
1942	325,499	14,706	2,757	17,463	389,609	84.2
1943	310,413	14,022	2,267	16,289	363,146	86.1
1944	372,950	16,649	2,330	18,979	427,137	87.7

Source: Annual report of dairy plants, 1919-1937, Mississippi Department of Agriculture and Commerce; and the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

¹See footnote 1 to appendix table 2.

Table 4. Dairy products manufactured and the amount of butterfat manufactured into each product, Mississippi, 1912-1944

Year	Pounds of			Pounds of butterfat manufactured into			
	Butter	Cheese	Condensed milk	Butter	Cheese	Condensed milk	Dairy products
	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>	<i>thous.</i>
1912	17	---	---	14	---	---	14
1913	184	---	---	148*	---	---	148
1914	336	---	---	270*	---	---	270
1915	590	---	---	475*	---	---	475
1916	1,474	---	---	1,186*	---	---	1,186
1917	2,648	---	---	2,131*	---	---	2,131
1918	2,948	---	---	2,375	---	---	2,375
1919	3,362	---	---	2,719	---	---	2,719
1920	3,162	---	---	2,575	---	---	2,575
1921	5,329	---	---	4,297	---	---	4,297
1922	6,671	---	---	5,411	---	---	5,411
1923	7,045	---	---	5,475	---	---	5,475
1924	6,376	---	---	5,152	---	---	5,152
1925	6,170	---	---	5,028	---	---	5,028
1926	6,903	---	6,266*	5,571	---	504*	6,075
1927	8,220	198	20,166*	6,638	61*	1,613*	8,312
1928	7,544	2,531	23,773*	6,101	785*	1,891*	8,777
1929	7,510	4,587	26,268	6,165	1,777	2,098	10,040
1930	6,611	4,436	23,630	5,290	1,529	2,037	8,856
1931	6,500	4,901	28,450	5,261	1,664	2,286	9,211
1932	8,884	5,696	29,284	7,141	2,053	2,269	11,468
1933	8,169	6,486	27,842	6,554	2,183	2,277	11,014
1934	6,974	6,519	27,726	5,620	2,226	2,398	10,244
1935	6,653	7,285	29,047	5,358	2,281	2,226	9,865
1936	6,050	7,762	36,346	4,865	2,540	2,875	10,280
1937	6,198	9,317	39,119	5,016	2,996	3,253	11,265
1938	7,315	11,006	45,101	5,904	3,606	3,757	13,267
1939	5,753	8,422	44,553	4,614	2,727	3,472	10,813
1940	4,787	6,983	39,723	3,779	2,173	3,191	9,143
1941	5,346	9,514	48,556	4,286	3,161	4,050	11,497
1942	4,189	10,471	54,506	3,358	3,763	4,296	11,417
1943	3,791	8,701	45,426	3,038	3,942	3,698	9,778
1944	4,491	10,969	55,972	3,615*	3,400*	4,418*	11,433

Source: "Growth of the Dairy Industry in Mississippi from 1912 to 1922," by L. A. Higgins, Dairy Specialist, Mississippi Extension Service; "Annual Report of the Dairy Extension," June 1917, Starkville, Mississippi; annual reports of dairy plants, 1919-1937, Mississippi Department of Agriculture and Commerce; and the annual summaries of dairy production, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

*Computed.

Table 5. Pounds of butterfat purchased from producers by plants manufacturing dairy products, by areas, Mississippi, 1916-1944

Year	Lower North-east Missis-sippi Milkshed Area <i>thous.</i>	Upper North-east Missis-sippi Milkshed Area <i>thous.</i>	Total North-east Missis-sippi Milkshed Area <i>thous.</i>	Upper Brown Loom Milkshed Area <i>thous.</i>	Central Missis-sippi Milkshed Area <i>thous.</i>	South-west Missis-sippi Milkshed Area <i>thous.</i>	Rest of State <i>thous.</i>	State <i>thous.</i>
1916	621	16	637	17	156	320	256	1,386
1919	1,159	80	1,239	58	734	608	535	3,174
1920	1,133	105	1,238	88	689	548	454	3,017
1921	1,853	186	2,039	246	1,000	875	734	4,894
1922	2,477	321	2,798	255	1,129	964	870	6,016
1923	2,596	434	3,030	286	1,052	910	1,108	6,386
1924	2,513	355	2,868	361	876	1,042	1,002	6,150
1925	2,062	349	2,411	322	781	1,210	1,544	6,268
1926	3,007	408	3,415	354	911	1,265	1,658	7,603
1927	4,269	1,218	5,487	422	970	1,391	2,054	10,324
1928	4,294	1,505	5,799	683	1,344	1,192	2,056	11,074
1929	4,249	1,470	5,719	977	1,861	1,195	1,961	11,713
1930	4,197	947	5,144	657	1,716	1,206	1,354	10,077
1931	4,586	1,248	5,834	885	1,951	1,266	690	10,626
1932	5,114	1,631	6,745	1,073	1,748	1,306	1,400	12,272
1933	5,459	1,549	7,008	1,099	1,698	1,208	1,630	12,643
1934	4,971	1,785	6,756	985	1,496	941	1,270	11,448
1935	4,774	2,170	6,944	915	1,424	694	1,200	11,177
1936	5,355	2,478	7,833	773	1,441	880	1,136	12,063
1937	6,174	2,896	9,070	1,268	1,599	800	747	13,484
1938	6,922	3,713	10,635	1,470	1,857	818	942	15,722
1939	6,082	2,795	8,877	1,033	1,370	757	752	12,789
1940	5,053	2,418	7,471	832	1,257	602	636	10,798
1941	6,069	3,501	9,570	929	1,608	558	919	13,584
1942	6,058	3,845	9,903	1,149	1,867	566	613	14,098
1943	5,670	3,744	9,414	377	1,646	571	961	12,969
1944	6,316	4,601	10,917	833	1,877	625	1,086	15,338

Source: "Annual Report of the Dairy Extension Division," June, 1917, Starkville, Missis-sippi; annual report of dairy plants, 1919-1944; Mississippi Department of Agriculture and Commerce; and the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

Table 6. Pounds of butterfat purchased from producers by all dairy plants reporting, by areas, Mississippi, 1929-1944

Year	Lower North-east Missis-sippi Milkshed Area <i>thous.</i>	Upper North-east Missis-sippi Milkshed Area <i>thous.</i>	Total North-east Missis-sippi Milkshed Area <i>thous.</i>	Upper Brown Loom Milkshed Area <i>thous.</i>	Central Missis-sippi Milkshed Area <i>thous.</i>	South-west Missis-sippi Milkshed Area <i>thous.</i>	Rest of State <i>thous.</i>	State <i>thous.</i>
1929	4,341	1,470	5,811	1,048	1,864	1,345	2,867	12,935
1930	4,292	947	5,239	715	1,723	1,428	2,030	11,135
1931	4,713	1,248	5,961	885	1,980	1,484	1,441	11,751
1932	5,273	1,632	6,905	1,119	1,748	1,513	2,337	13,622
1933	5,607	1,550	7,157	1,144	1,698	1,475	2,467	13,943
1934	5,157	1,785	6,942	1,039	1,496	1,150	2,172	12,799
1935	5,013	2,170	7,183	962	1,424	1,122	1,935	12,625
1936	5,477	2,480	7,957	827	1,441	1,596	1,956	13,777
1937	6,347	2,900	9,247	1,310	1,599	1,460	1,647	15,263
1938	7,105	3,723	10,828	1,506	1,857	1,190	1,662	17,043
1939	6,286	2,809	9,095	1,061	1,370	1,172	1,559	14,257
1940	5,234	2,423	7,657	880	1,264	1,316	1,633	12,750
1941	6,304	3,509	9,813	960	1,608	2,213	2,112	16,706
1942	6,343	3,897	10,240	1,199	1,866	2,226	1,932	17,463
1943	5,952	3,749	9,701	417	1,645	2,043	2,483	16,289
1944	6,578	4,649	11,227	872	1,878	2,507	2,495	18,979

Source: Annual reports of dairy plants, 1929-1944, Mississippi Department of Agriculture and Commerce; and the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

Table 7. Seasonal variation in dairy products manufactured and fluid milk sold, Mississippi, 1938-1944

Month	Percent of annual volume manufactured each month				Percent of annual volume of fluid milk sold each month
	Butter	Cheese	Condensed milk	Ice cream	
January	5.41	3.98	4.96	3.85	6.94
February	5.53	4.30	5.63	4.02	6.67
March	5.35	5.11	6.84	6.07	7.99
April	7.65	8.39	10.02	7.81	8.62
May	11.97	14.42	11.64	10.33	9.19
June	10.30	12.76	10.88	12.20	9.00
July	10.98	12.47	11.58	12.74	9.27
August	11.93	12.24	11.35	12.51	8.72
September	9.14	8.97	9.07	11.23	8.53
October	8.67	7.27	7.15	9.17	8.66
November	7.54	5.64	5.84	5.81	8.22
December	5.53	4.44	5.06	4.26	8.17
Year	100.00	100.00	100.00	100.00	100.00

Source: Computed from the annual summaries of dairy production, 1938-1944, Agricultural Statistician, Bureau of Agricultural Economics, Gulfport, Mississippi.

Table 8. Seasonal variation in milk purchased from producers, by areas, Mississippi, 1938-1944

Month	Milkshed area				
	Upper Northeast Mississippi ¹	Lower Northeast Mississippi ¹	Upper Brown Loam ¹	Central Mississippi ¹	Southwest Mississippi ²
January	5.60	4.17	4.56	4.41	6.83
February	5.54	4.80	4.39	4.47	6.67
March	6.92	6.58	5.28	6.10	7.83
April	9.12	9.81	8.70	9.42	8.99
May	12.54	13.02	13.17	12.33	9.95
June	11.85	12.49	12.48	12.08	9.55
July	11.79	12.87	12.50	12.69	9.81
August	10.86	12.07	11.51	11.50	9.19
September	8.23	9.23	9.13	8.97	8.56
October	6.32	6.79	7.00	7.22	8.19
November	5.63	4.46	5.89	6.07	7.16
December	5.62	3.71	5.39	4.74	7.27
Total	100.00	100.00	100.00	100.00	100.00

Source: Annual reports of dairy plants, 1938-1944, Mississippi Department of Agriculture and Commerce.

¹Based on purchases at one plant.

²Based on purchases at two plants.

Table 9. Average butterfat content of milk by areas, by month, Mississippi, 1938-1944

Month	Milkshed area				
	Upper Northeast Mississippi ¹	Lower Northeast Mississippi ¹	Upper Brown Loam ¹	Central Mississippi ¹	Southwest Mississippi ²
January	5.11	5.02	4.92	5.01	4.81
February	4.88	4.65	4.69	4.70	4.68
March	4.65	4.39	4.40	4.43	4.58
April	4.35	4.29	4.18	4.27	4.47
May	4.29	4.29	4.18	4.25	4.44
June	4.26	4.28	4.19	4.14	4.37
July	4.23	4.36	4.27	4.19	4.34
August	4.31	4.53	4.37	4.35	4.42
September	4.56	4.80	4.59	4.59	4.55
October	4.99	5.31	4.95	4.92	4.72
November	5.22	5.65	5.21	5.22	4.84
December	5.28	5.38	5.10	5.14	4.87
Year	4.56	4.60	4.48	4.49	4.57

Source: Annual reports of dairy plants, 1938-1944, Mississippi Department of Agriculture and Commerce.

¹Based on purchases at one plant.

²Based on purchases at two plants.