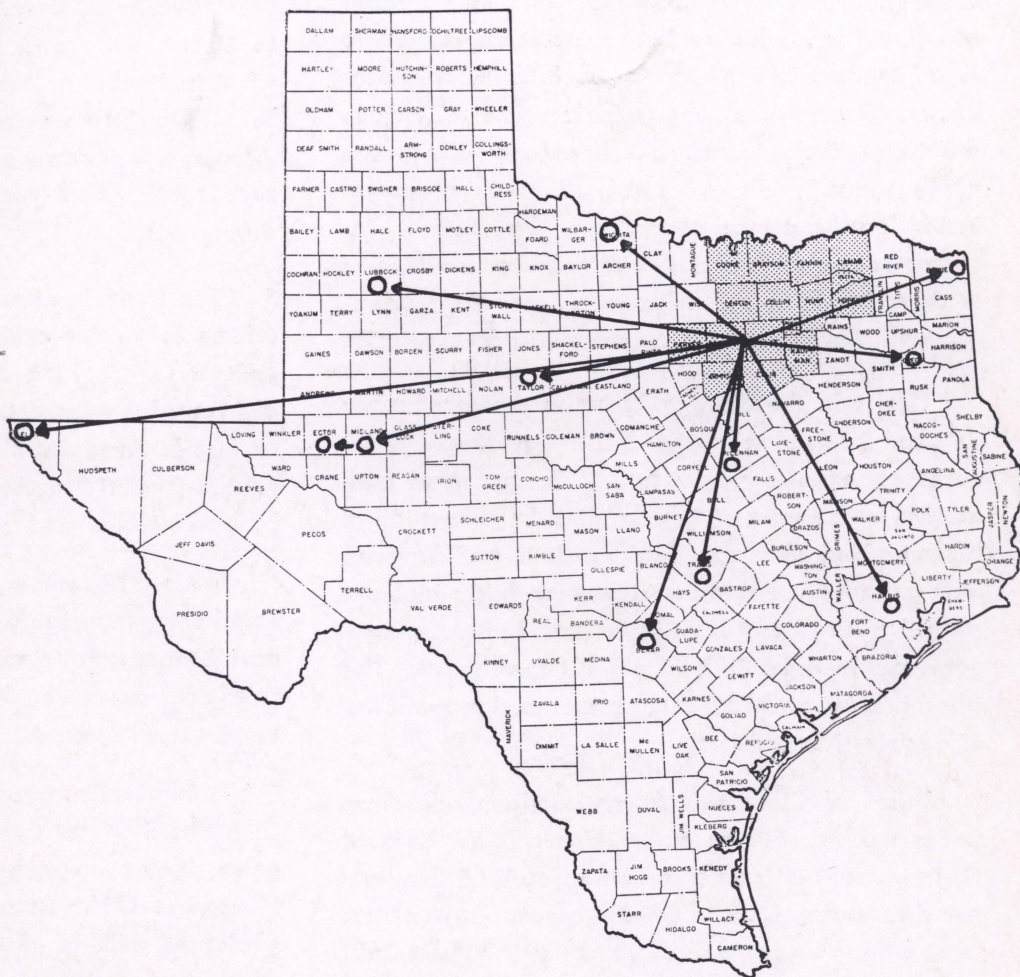




Trends in Sales of Milk in North Texas



Area covered by the North Texas milk marketing order and major out-of-area packaged milk distributing points of North Texas handlers.

JULY 1958

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TEXAS AGRICULTURAL EXPERIMENT STATION

R. D. LEWIS, DIRECTOR, COLLEGE STATION, TEXAS.

Summary

The nature of consumer demand for milk and milk products is changing. Analysis of the disposition of milk and milk products in terms of trends and seasonal fluctuations in sales furnishes the dairy industry a picture of changing desires, attitudes and needs of consumers and enables people in the industry to cope more effectively with existing conditions and to be in a better position to anticipate or influence future trends to the interest of the industry. Promotional efforts to increase milk sales are more likely to succeed if greater efforts are made to supply milk and milk products to consumers in the form and type of container they desire. Increased sales of fluid milk will result in greater use of Class I milk, larger volumes of sales by distributors and higher prices to dairy farmers for raw milk.

Efforts in the dairy industry to create stronger demand for fluid milk and to increase efficiency include changes to paper and to larger sized containers, both paper and glass, and the promotion of homogenized, skim and fortified-skim, and flavored milk and drink. Paper containers for fluid milk have played a large part both in the trend to more store sales and in expanding milk distributing areas. The trend has been toward more paper and more of the larger sized containers.

Sales of Class I milk by handlers operating under the regulations of the North Texas Federal Order increased from an average of 641,552 quarts per day during 1952 to 806,768 quarts during 1957, representing an increase of 26 percent. Whole fluid milk sales accounted for most of this increase.

Sales of homogenized milk increased from 441,311 quarts per day during 1952 to 691,670 quarts during 1957, while regular milk sales decreased from 109,924 to 12,370 quarts per day during this period. This indicates the growing acceptability of homogenized milk and the decreasing importance

in consumers' minds of a "cream line" appearing at the top of a bottle of milk.

On a quart-equivalent basis, daily sales of other Class I milk products from 1952-57 reacted as follows:

Flavored milk and drink increased from 14,476 to 30,922; skim and fortified-skim increased from 4,988 to 12,563; half and half increased from 6,289 to 11,604; coffee cream decreased from 5,431 to 2,478 quarts per day; and whipping cream increased from 2,440 quarts per day in 1952 to 3,026 quarts during 1957.

The trend in sales is toward larger sized containers and more sales at wholesale and in paper containers. In 1952, 53 percent of total fluid milk distributed by handlers was in containers 1 quart or less in size. During 1957, only 29 percent was sold in 1-quart containers while 71 percent was sold in half gallons and larger containers.

During November 1952, 70 percent of regular and homogenized milk was distributed at wholesale and 30 percent at retail. In November 1957, wholesale sales accounted for 79 percent of the total and retail sales 21 percent.

Sale of milk in paper containers increased from 53 percent of all regular and homogenized milk sales during November 1952 to 72 percent during November 1957. During this same period, sales of packaged milk in glass containers decreased from 46 percent to 25 percent.

Total sales of Class I products generally are higher during the fall and winter and lower during spring and summer. Termination of the school lunch program and substitution of iced tea and other cold soft drinks for milk during the summer accounts partly for this seasonal pattern.

Trends in Sales of Milk in North Texas

RANDALL STELLY and KENNETH MCKINNEY*

SEASONALITY OF MILK PRODUCTION PER COW is the greatest factor contributing to increases or decreases in milk production within any given part of a year. In the long run, major changes in total production of milk usually result from changes in the number, breed and composition of cows in the milking herd, or from increased production per cow by improved breeding, feeding or other basic dairying practices. However, the volume of milk produced within 1 year, or less, is affected only slightly by current farm prices for milk because most decisions regarding adjustments in production are made by dairy farmers more than a year in advance of the production period. Therefore, the total milk supply is hardly affected by prices received by farmers for milk. However, there may be exceptions to this in certain areas. For example, when their existing producing herds produce substantially less than normal, farmers may purchase producing cows from breeders in another area in an attempt to maintain their normal level of output.

Farm income from dairying depends largely on prices received by farmers for fluid milk and milk products. Prices received by dairy farmers for milk depend mainly on consumer demand for milk and milk products and the total supply of milk. Studies by the United States Department of Agriculture indicate that, assuming no change in demand for dairy products, for each 10 percent increase in the production of milk, prices received by farmers for milk tended to decrease slightly more than 20 percent between World Wars I and II and slightly more than 30 percent since World War II. These studies also indicate that a larger reduction in price is needed to sell an equivalent quantity of product for fluid milk than for manufactured dairy products. Thus, the price elasticity appears higher for manufactured dairy products than for fluid milk.

Whole milk is utilized in the preparation of many products. Total consumption depends on retail prices of fluid milk and milk products and income and dietary habits of consumers. To fully explain the demand for milk, all segments of the market for fluid milk and milk products must be studied simultaneously.

The consumption of any one dairy product depends not only on the demand for that product, but also on the consumption of all other dairy pro-

ducts, because in the short run the same fixed supply of milk must furnish the total consumption of all dairy products.

Milk and Milk Products Consumption

Beginning in 1934, farm income from dairying in relation to total income from agriculture increased steadily to a peak of 19 percent in 1940 and then declined gradually to 14.7 percent during 1956. In Texas, income from dairying in relation to total income from agriculture more than held its own during that same period. Income from dairying in the State was 4 percent of total agricultural income during 1930; it increased to 5.4 percent in 1940 and to 5.6 percent in 1945. After decreasing to 4 percent in 1950, it increased steadily to 7.7 percent of total agricultural income in 1956. The increase in farm income from dairying in Texas relative to the average for the United States results from an increase in the

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amount of milk purchased by farm families, who formerly produced the milk they consumed, and increases in the amount of whole milk sold by farmers to plants and dealers and in the total value of this milk.

Studies by the USDA indicate that the average retail prices for dairy products increased less than prices of all foods during the past 25 years. The same studies indicate two pronounced, but opposing, trends in the consumption of milk products during recent years; an uptrend in the consumption of solids-not-fat and a downturn in the per capita consumption of milk fat. The decline in the use of milk fat has resulted from replacement of milk fat by vegetable fat in other products and a reduction in the fat content of some dairy products, including lower fat content of current sales of fluid milk, lower fat content in ice cream, increased sales of processed and cottage cheese and smaller sales of fluid cream. The result is that the per capita consumption of milk fat averaged 27 pounds per year during 1954-56 compared with 30 pounds or more for every year before 1948.

The yearly North Texas per capita consumption of milk solids-not-fat has increased from about 37 pounds to about 49 pounds during the past 25 years. However, for the nation as a whole, this higher rate of consumption is sufficient to utilize domestically only about 80 percent of the total milk solids-not-fat produced for human consumption, but still is higher than the 50 percent used three decades ago. The increase in consumption of milk solids-not-fat is due to the relatively greater use of dairy products containing both solids-not-fat and the fat portion of milk, the introduction of new or increased uses of nonfat products for household uses and for manufacture and retail sales of nonfat milk powder during recent years. For example, the per capita consumption of cheese in 1954-56 averaged 40 percent above the 1935-39 level, and fluid milk, 16 percent.

This increased consumption of milk solids-not-fat has helped to prevent larger declines in dairy income than otherwise would have resulted from reduced consumption of milk fat because a larger portion of total milk production has been moved into higher priced products and farmers have shifted from selling farm-separated cream to marketing fluid milk. Despite these shifts, cash incomes to dairy farmers have remained fairly satisfactory. This situation can be attributed to the fact that cash income is realized from a larger portion of the total nonfat content of milk sales and whole milk usually commands a higher price than does an equivalent quantity of farm-separated cream.

Dairy industry people should be aware of the changing nature of the market for milk and milk products in the United States if they desire to operate efficiently, expand total sales and obtain

higher prices for their product. A changing, or constantly growing population affects the demand for milk and milk products. In addition, seasonal factors affecting changes in consumption habits, such as increased use of iced tea and soft drinks during the summer, change the demand for milk.

Need for the Study

To maintain their competitive operational position, the dairy industry should adopt many technical changes in milk assembly, processing, packaging and distribution that contribute to increased efficiency. They also should respond quickly to changes in consumers' tastes and to changes in the form that consumers prefer those products.

Along with changes in his food purchases, the consumer has changed his milk consumption habits. Concerning milk, these changes focus primarily on the type of milk and the size, shape and type of milk containers. Promotional efforts by the dairy industry to increase milk sales will be more successful if efforts are made to supply milk and milk products to consumers in the form and type of container they desire. Increased sales of fluid milk will result in greater use of Class I milk, larger volumes of total sales by milk handlers and distributors and higher prices to dairy farmers for raw milk.

To better understand the nature of the demand and the changes taking place, it is necessary to evaluate the trends in milk sales by type and form. Such an analysis of the disposition of milk and milk products in terms of trends and seasonal fluctuations in sales should present the dairy industry with a comprehensive picture of changing desires, attitudes and needs of consumers. With such broader understanding of the nature of demand for milk and dairy products, the industry can better cope with existing conditions, and should be in better position to anticipate or influence future trends in the best interest of producers, handlers and consumers of dairy products.

Milk has its highest order use in Class I, or fluid form, in the sense that it commands a higher price at all levels of marketing than when it is used for manufacturing dairy products. In most Texas markets during 1957, prices received by farmers for Class II, or manufacturing milk, were about 55 percent of the price they received for milk utilized in fluid form. In some Texas markets, 30 percent of the milk sold by local dairymen was utilized in manufacturing dairy products which indicates that, in those areas, marketings of fluid or Class I milk accounted for about 80 percent of dairy farm income during periods of peak production. During 1957 about 15 percent of the 9.9 million pounds of milk marketed daily by Texas commercial dairymen were sold as Class II or manufacturing milk.

For these reasons it is desirable to move as much of the total milk sales as possible into fluid

use. Research designed to improve marketing efficiency and increase demand for fluid milk can help guide the industry in making needed adjustments.

During recent years, many of the efforts in the dairy industry to create greater demand for fluid milk and improve efficiency in milk distribution have been directed at packaging and type of product. Some of these efforts include changes to paper and to larger sized containers both in paper and glass, and to promotion of homogenized, skim and fortified-skim and flavored milk and drink. Paper containers for fluid milk have played a large part in the trend to more store sales in expanding milk-distributing areas.

Greater economies are needed in milk distribution. According to studies of the USDA, the average marketing margin for a single quart of fluid milk has increased about 17 percent since 1952 and amounts to about 55 percent of the retail price compared with about 49 percent in 1952. However, the same studies indicate that the average marketing margin for all sales of fluid milk has increased less than for single quarts because of the shift toward larger sized containers which makes lower distribution costs possible.

The nature of dairy farming and the way milk is handled, packaged and distributed are changing. Texas dairy industry people have shown great interest in obtaining information on trends in the sale of the various Class I fluid milk products and the use of different kinds and sizes of containers in which these products are packaged and distributed. For example, milk plant overhead is affected materially by the number of different container sizes packed. If output can be restricted to a smaller number of different containers, considerable savings would result. Information is needed as to whether it would be practical for a milk handler to restrict the number of container sizes in use and still maintain sales volume and consumer satisfaction.

Objectives of the Study

The general objectives of this study are to present the Texas dairy industry with information on the changing nature of consumer demand for fluid milk and fluid milk products and to indicate the direction that should be taken to increase total sales of fluid milk products so as to increase incomes to producers and greater utilization of milk in its highest price class. The specific objectives of this study are:

1. To determine the monthly trend in the quantities of milk sold in packaged form for each product classified as Class I milk in the North Texas Marketing area;
2. To determine the trend in the use of different size containers in the sale of fluid milk products;
3. To show the shifts that have occurred during selected months in wholesale and re-

tail distribution of milk and in the use of paper and glass containers; and

4. To determine the extent of monthly, seasonal and yearly variations in Class I milk utilization as shown by sales of individual Class I products and the demand for these products in various size containers.

The graphs, tables and other data are included more to present the factual findings of this study relative to what has happened during the last 6 years than to predict what might happen in the future.

Method of Study and Sources of Data

Data used in this study were obtained from the office of the administrator of the North Texas Federal Milk Marketing Order. They are based on monthly reports from each milk handler operating under the regulations of the North Texas Federal Order from October 1, 1951 through December 31, 1957. Before October 1, 1951, the effective date of the North Texas Federal Order, no records were available to provide the data for that market.

The data for all plants were analyzed into daily sales on a quart-equivalent basis for each Class I product.

Trends in sales of the different Class I products and container sizes are shown by means of a second degree trend line curve ($Y_c = a + bx + cx^2$) in each case. This type of trend line shows the overall trend of each item under consideration and indicates rates of change on a monthly basis throughout the series. Graphs present average trends of the items during the 6-year period.

The seasonal pattern of sales of different Class I products and of the use of different size containers was computed in the following manner: To eliminate trend and cyclical fluctuations, the original data were expressed first as percent of the computed trend values. These monthly percentages, or seasonal relatives, were arrayed by months within years. Using data from October 1, 1951 through December 1957 made it possible to have six seasonal relatives for each month.

To eliminate irregular factors, a median for each monthly data was obtained after arraying monthly seasonal relatives. This resulted in 12 typical seasonal relatives, or crude seasonal indices, which were adjusted for small irregularities such as rounding of figures.

Trends in the Sale of Various Class I Products

All data are computed on a daily quart-equivalent basis and represent only packaged Class I sales and some processed milk distributed in bulk. The overall trend in Class I sales by handlers operating under the regulations of the North Texas

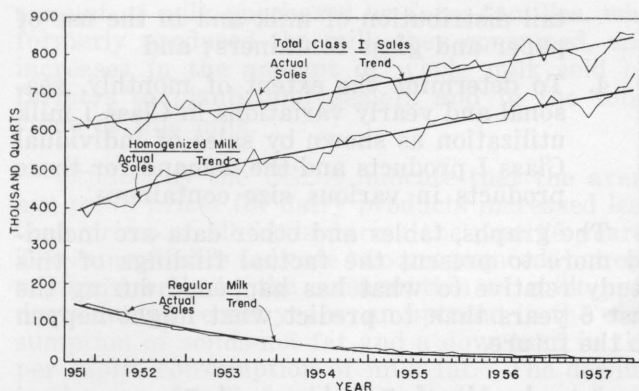


Figure 1. Trends in sales of total Class I milk, homogenized and regular milk, North Texas Market, October 1951 through December 1957.

Federal Order has increased at an increasing rate since the effective dates of the Order, October 1, 1951, Figure 1.

Class I sales increased from an average of 641,552 quart-equivalents per day during 1952 to 806,768 quarts per day during 1957. This represents an increase in the volume of Class I sales of about 26 percent during 1952-57. Part of this larger volume of sales results from increased population in the North Texas Milk Marketing area, and part is caused by increased per capita consumption during the past few years.

Part of this increase also results from larger volumes of packaged milk deliveries by North Texas handlers at other points in the state (indicated on cover map) outside the marketing area and increased sales in southern Oklahoma.

Whole fluid milk sales accounted for most of this increase. However, sales of flavored milk and drink, half and half, sour cream and whipping cream also have increased significantly during this period. Sales of other Class I products, such as homogenized milk and skim and fortified-skim milk also have increased during this period, but these increases have occurred at decreasing rates.

Regular and Homogenized Milk

The relationship between the sales of regular and homogenized milk is indicated in Figure 1.

TABLE 1. PERCENT OF DAILY FLUID MILK SALES UTILIZED IN VARIOUS PRODUCTS, NORTH TEXAS MARKET, OCTOBER 1951-DECEMBER 1957

Year (Monthly average)	Type of milk product							
	Regular	Homogenized ¹	Skim and fortified-skim	Buttermilk	Flavored milk and drink	Half and half	Coffee cream	Miscellaneous ²
	Percent							
1951 (Oct. Nov. Dec.)	23.6	62.5	.6	8.7	2.2	1.0	1.0	.4
1952	17.1	68.8	.8	8.8	2.3	1.0	.8	.4
1953	9.8	76.0	1.2	8.4	2.5	1.0	.7	.4
1954	5.9	79.5	1.4	8.2	2.9	1.1	.6	.4
1955	3.5	81.7	1.3	7.8	3.5	1.3	.5	.4
1956	2.2	83.3	1.4	7.2	3.7	1.4	.4	.4
1957	1.5	84.4	1.6	6.7	3.7	1.4	.3	.4

¹Includes special milk and Multi-vitamin.

²Includes whipping cream, sour cream and yogurt.

(Regular milk referred to in this study is commonly called Standard milk.) Table 1 shows the percentage of the total packaged Class I sales represented by various Class I products and indicates that regular milk accounted for 17.1 percent of the total during 1952 and homogenized milk represented 68.8 percent. During 1957, however, regular milk sales represented only 1.5 percent of the total while homogenized milk sales increased to 84.4 percent.

The trend of regular milk sales indicates that sales of this product leveled out during 1956-57. The trend of homogenized milk sales increased steadily throughout, but the rate of increase has been at a decreasing rate. All special milks such as Multi-vitamin, Golden Guernsey and such are included in the regular and homogenized total according to whether such products were homogenized.

On a daily quart-equivalent basis, regular milk sales decreased from an average of 109,924 quarts per day during 1952 to an average of 12,370 quarts per day during 1957. During this same period, homogenized milk sales increased from an average of 441,311 quarts per day during 1952 to 691,670 quarts per day during 1957. This substitution of homogenized for regular milk represents the growing consumer acceptance of homogenized milk and the decreasing importance in the minds of consumers of a "cream line" appearing at the top of a bottle of whole milk.

Buttermilk

The trend in the sales of buttermilk remained almost constant during the period of this study, Figure 2. Table 1 shows that during 1952, sales of buttermilk represented 8.8 percent of the total packaged Class I sales and during 1957, 6.7 percent. On a daily quart-equivalent basis, buttermilk sales amounted to 56,483 per day during 1952, but decreased to 55,391 quarts per day during 1957.

Flavored Milk and Drink

The daily sales of flavored milk and drink increased from an average of 14,476 quart equivalents per day in 1952 to 30,992 per day during 1957, representing more than a 100 percent in-

crease. Available information indicates that flavored milk represents approximately 93 percent of the total sales for flavored milk and drink. Flavored drink sales have remained fairly constant during the last 3 years and almost all of the increase in the sale of these products came from flavored milk. Percentagewise, the sale of these two products represented an average of 2.3 percent of the total Class I packaged sales in 1952, but during 1957 this increased to an average of 3.7 percent.

Figure 2 shows the average daily sales of these two products, combined on a quart-equivalent basis, along with the overall trend since October 1952. Sales of these two products have been increasing at an increasing rate and seasonal fluctuations in sales have been increasing. These increased seasonal fluctuations may be explained partially by the increased use of these products in school lunch menus. The special school lunch milk program definitely has increased the seasonal extremes.

Skim and Fortified-skim

During recent years people in the dairy industry have shown considerable interest in the trend in sales of low-fat milk products. Monthly sales of skim and fortified-skim milk on a daily quart-equivalent basis since October 1951 occurred at a decreasing rate, although the overall trend has been increasing. Fortified-skim milk referred to in this study includes only skim milk to which additional solids-not-fat have been added.

On a daily quart-equivalent basis the sales of these two products have increased from an average of 4,988 in 1952 to 12,563 in 1957. The increasing sales of skim and fortified-skim and homogenized milk, and the decreasing sales of regular milk indicate the degree to which consumers' attitudes toward the butterfat content of fluid milk is changing. In the North Texas market, all skim milk products have been accounted for on a skim-equivalent basis since October 1955. Total solids analysis was used to determine if, and to what extent, milk products were being fortified with additional milk solids-not-fat. For example, in 1957 approximately 1.6 million pounds were represented by the addition of solids-not-fat on a skim-equivalent basis in fortified-skim, half and half and sour cream by handlers operating in the North Texas market. On the basis of information obtained from analysis of solids, skim and fortified-skim milk were separated beginning in October 1955. Percentagewise, fortified-skim milk accounts for approximately 78 percent of the total sales of both skim and fortified-skim milk.

Half and Half

The trend in sales of half and half has increased continually since October 1951, Figure 3. There has been a definite seasonal pattern in the sale of this product, increasing during the fall and winter and declining during the spring. On a

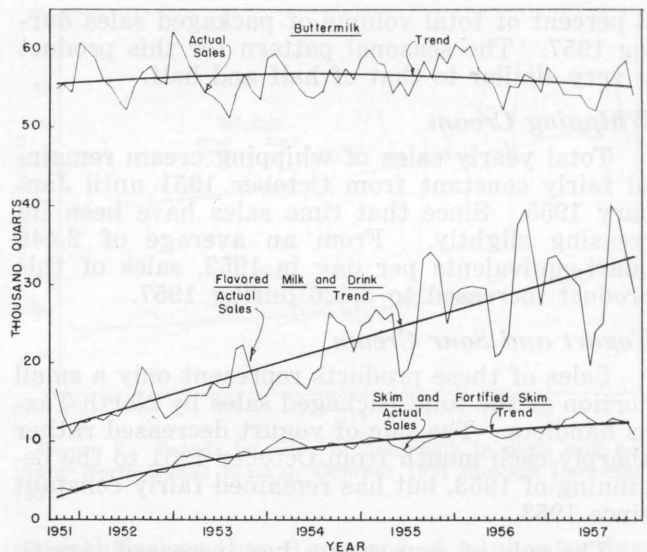


Figure 2. Trends in sales of buttermilk, flavored milk and drink and skim and fortified skim milk, North Texas Market, October 1951 through December 1957.

daily quart-equivalent basis, half and half sales increased from an average of 6,289 in 1952 to 11,604 during 1957. However, sales of half and half accounted for only about 1 percent of total sales of packaged milk sales during 1952 and 1.4 percent during 1957.

Coffee Cream

The monthly trend in sales of coffee cream on a daily quart-equivalent basis is shown in Figure 3. Coffee cream sales have decreased steadily since the fall of 1952, but the decrease has been at a decreasing rate and appeared to be leveling out during the last few months of 1957. On a daily quart-equivalent basis, coffee cream sales decreased from an average of 5,431 or .8 percent of total packaged sales during 1952 to 2,478, or

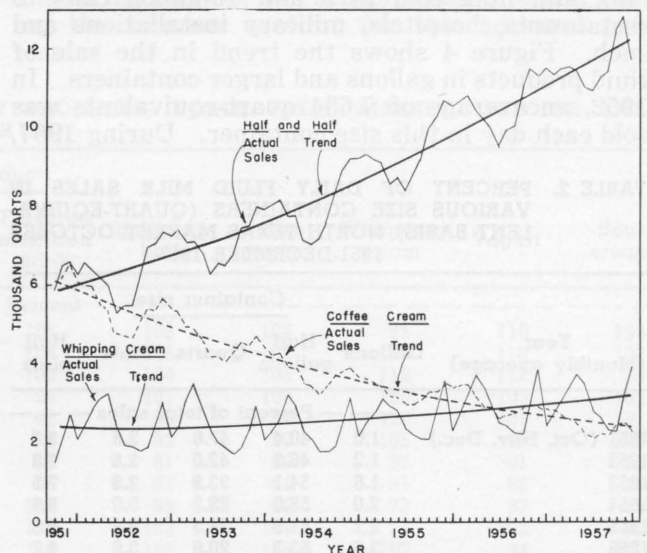


Figure 3. Trends in sales of half and half, coffee cream and whipping cream, North Texas Market, October 1951 through December 1957.

.3 percent of total volume of packaged sales during 1957. The seasonal pattern for this product is very similar to that of half and half.

Whipping Cream

Total yearly sales of whipping cream remained fairly constant from October 1951 until January 1955. Since that time sales have been increasing slightly. From an average of 2,440 quart-equivalents per day in 1952, sales of this product increased to 3,026 during 1957.

Yogurt and Sour Cream

Sales of these products represent only a small portion of the total packaged sales by North Texas handlers. The sale of yogurt decreased rather sharply each month from October 1951 to the beginning of 1953, but has remained fairly constant since 1953.

The sale of sour cream has increased significantly since 1952. However, in spite of this large increase, sales of this product averaged only 320 quarts per day during 1957.

Use of Various Size Containers

Dairy industry people have indicated increasing interest for more information on the relative amount of milk sold in different size containers. The different units used for each fluid product were combined to obtain the total number of each unit for all fluid products. These were converted to daily quart-equivalents for purposes of comparison. Table 2 shows the percentage of the total volume of fluid-packaged sales that was sold in each size container from October 1951 through December 1957.

Gallons and Larger Containers

The gallon sales referred to include sales made in gallon-sized containers, plus bulk-dispenser milk and milk sold in 5 and 10-gallon cans to restaurants, hospitals, military installations and such. Figure 4 shows the trend in the sale of fluid products in gallons and larger containers. In 1952, an average of 7,634 quart-equivalents was sold each day in this size container. During 1957,

TABLE 2. PERCENT OF DAILY FLUID MILK SALES IN VARIOUS SIZE CONTAINERS (QUART-EQUIVALENT BASIS), NORTH TEXAS MARKET, OCTOBER 1951-DECEMBER 1957

Year (Monthly average)	Container size				
	Gallons ¹	Half gallons	Quarts	Pints	Half pints
	--- Percent of total sales ---				
1951 (Oct. Nov. Dec.)	1.0	40.4	47.6	2.8	8.2
1952	1.2	46.2	42.0	2.8	7.8
1953	1.6	54.1	33.9	2.9	7.5
1954	2.0	58.0	29.2	3.0	8.8
1955	2.2	61.9	24.3	3.3	8.3
1956	3.6	63.5	20.6	3.6	8.7
1957	7.3	63.6	17.4	3.7	8.0

¹Includes sales in containers larger than 1 gallon, such as bulk dispensers.

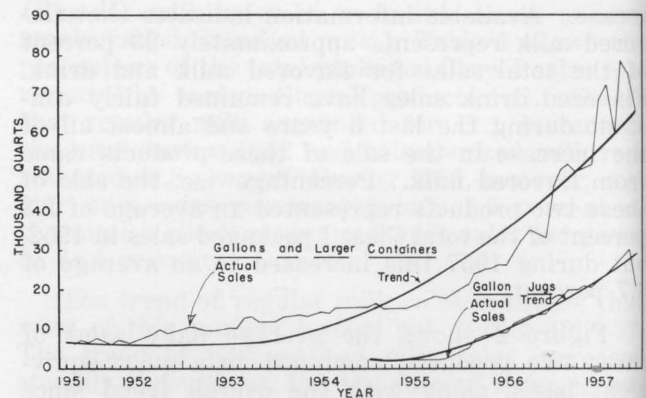


Figure 4. Trends in sales of fluid milk in gallons and larger containers, North Texas Market, October 1951 through December 1957.

this had increased to 60,144 quarts, representing more than a sevenfold increase. The volume of fluid products sold in gallon and larger containers represented only 1.2 percent of total sales of packaged fluid products in 1952, but in 1957 sales in these size containers increased to 7.3 percent of total packaged milk sales. Much of the increase during 1957 represents sales in 5 and 10-gallon milk dispensers by handlers fulfilling contracts with military establishments.

Gallons

Because of the confidential nature of the data, information concerning the volume of milk sold in gallon-sized containers prior to January 1955 could not be released. During 1955, an average of 2,416 quart-equivalents per day was distributed in gallon containers. During 1957, this had increased to an average of 22,301 quart-equivalents per day and represented 2.7 percent of all the packaged fluid sales, Figure 4.

Half Gallons

The sale of packaged fluid products in half-gallon containers on a daily quart-equivalent basis is shown in Figure 5. While sales in this size con-

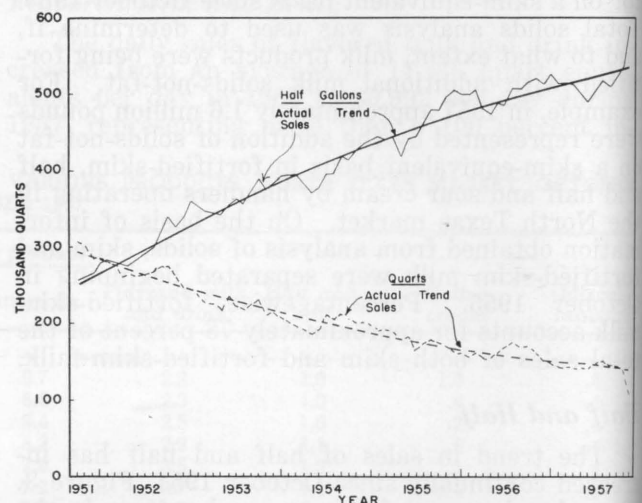


Figure 5. Trends in sales of fluid milk in half gallon and quart containers, North Texas Market, October 1951 through December 1957.

tainer have increased each year since 1951, the increase occurred at a decreasing rate. Table 2 indicates that 46.2 percent of the total volume of packaged Class I milk was sold in half-gallon containers during 1952 while during 1957 sales in this size container represented 63.6 percent of the total. Most of the increase occurred at the expense of the quart-equivalent sales which declined during this period.

Quarts

Forty-two percent of all the packaged fluid products were distributed in quart containers during 1952, but during 1957 sales in this size container represented only 17.4 percent, Table 2 and Figure 5. The gradual decrease in the use of the quart container throughout this period is comparable to the increase in the use of half-gallon containers.

Pints

The sale of milk and other fluid products in pint containers does not represent a large portion of the total packaged sales. In 1952, 2.8 percent of the total sales were in pints, compared with 3.7 percent in 1957, Table 2 and Figure 6. The amount sold in pints has increased during the period under study, but the percent of total sales represented by pints has remained fairly constant. On a daily quart-equivalent bases, sales in pint containers increased from an average of 18,378 in 1952 to 30,129 during 1957. (The data indicated for pints also include a small number of three-fourths pints.)

Half Pints

The sale of fluid products in half pints on a daily quart-equivalent basis is shown in Figure 6 which indicates that use of half-pint containers increased steadily during recent years. Wider use of half pints for milk distributed under the school lunch program contributed to increased milk sales in this size container. Although the portion of total sales made in half-pint containers remained

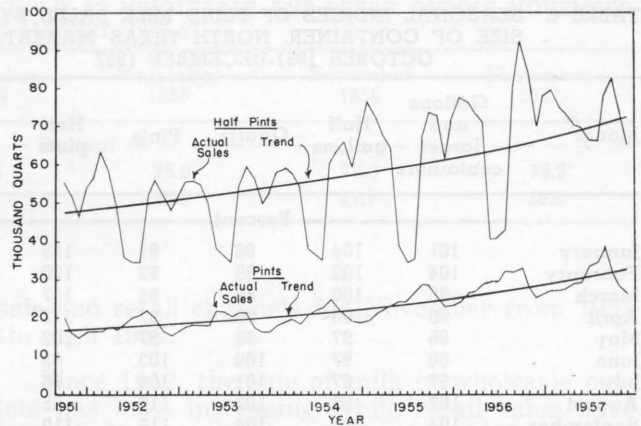


Figure 6. Trends in sales of fluid milk in pints and half-pints, North Texas Market, October 1951 through December 1957.

at slightly less than 9 percent of total sales during the period, the volume of fluid products moving in half-pint containers increased from an average of 49,882 quart-equivalents per day in 1952 to 65,804 during 1957.

Seasonal Variations in the Sale of Various Class I Products and Use of Different Size Containers

In addition to the use of different size containers, there is also great interest in the seasonal pattern of sales of Class I products. The seasonal pattern of sales of Class I products is shown in Table 3 and of sales in different container sizes in Table 4. Generally, sales of Class I milk and milk products are highest during the fall and winter and lowest during spring and summer. Substitution of iced tea and other cold soft drinks for milk and termination of the school lunch program during the summer account for this seasonal pattern.

TABLE 3. SEASONAL INDICES OF FLUID MILK SALES BY PRODUCTS, NORTH TEXAS MARKET, OCTOBER 1951-DECEMBER 1957

Month	Type of milk product										
	Class I sales	Regular milk	Homogenized milk	Butter-milk	Skim and fortified skim	Flavored milk and drink	Half and half	Coffee cream	Whipping cream	Yogurt	Sour cream
	Percent										
January	103	109	102	106	102	104	105	106	85	110	103
February	102	107	101	106	103	104	106	105	99	110	107
March	102	106	101	104	106	102	104	104	112	112	98
April	99	99	98	100	106	98	101	100	130	103	102
May	96	99	96	96	105	98	98	97	120	101	101
June	94	92	94	96	100	76	92	90	105	97	100
July	96	93	98	94	93	84	91	90	93	91	93
August	97	92	98	98	91	90	92	94	81	95	90
September	104	100	104	101	101	124	95	96	73	97	94
October	104	93	103	101	101	120	103	104	74	102	94
November	102	102	103	100	99	110	106	105	102	94	102
December	101	108	102	98	93	90	107	109	126	88	116
Average	100	100	100	100	100	100	100	100	100	100	100

TABLE 4. SEASONAL INDICES OF FLUID MILK SALES BY SIZE OF CONTAINER, NORTH TEXAS MARKET, OCTOBER 1951-DECEMBER 1957

Month	Gallons and larger containers	Half gallons	Quarts	Pints	Half pints
Percent					
January	101	104	98	91	115
February	104	102	96	92	120
March	96	100	98	94	117
April	90	100	96	97	112
May	86	97	98	97	103
June	88	97	100	103	69
July	97	97	101	108	66
August	107	99	103	110	65
September	104	101	104	116	110
October	120	102	104	111	116
November	112	100	103	94	110
December	95	101	99	87	97
Average	100	100	100	100	100

Class I Products

In general, the sale of homogenized milk followed the general pattern of total packaged sales of Class I products, varying somewhat in the magnitude of extreme fluctuations. Regular milk sales reacted quite differently, being highest in the winter and lowest during the fall. The seasonal pattern of homogenized sales, also includes Multi-vitamin sales.

Generally, sales of homogenized milk are highest during September and October and lowest during June, while regular milk sales reach a peak during January and a low level during June.

The seasonal pattern for sales of skim and fortified-skim milk, buttermilk, yogurt and flavored milk and drink indicates that sales of skim and fortified-skim milk reach a high during March and May and are lower during September. Buttermilk sales generally are highest in January and lowest during July. Yogurt sales reach a peak during March and decline to a low point in September. Flavored milk and drink sales exhibit a different seasonal pattern than other Class I products. The highest monthly sales of this product are registered in September and lowest sales in June.

Cream products include half and half, coffee cream, whipping cream and sour cream. The sale of half and half usually reaches a high in December and a low in July. Coffee cream sales also have followed this same general pattern. Whipping cream sales show a seasonal pattern with two high peaks and two low levels. Beginning in January, when sales of this product are at a low level, sales generally increase each month to a high in April, then decline to a low point in September, at which time sales start increasing again to another peak in December. Use of whipping cream on fresh fruits during the spring and in holiday (Thanksgiving and Christmas) menus in the fall and early winter probably accounts for the large increases in the sale of this product during

these two periods. Sour cream sales reach a peak in December with August the month of lowest sales.

Container Sizes

The seasonal pattern of Class I packaged sales in various size containers is indicated in Table 4. Sales of fluid products in gallon and larger sized containers usually reach a peak during October each year and a low level in May. January is the high month of half-gallon sales while May, June and July are the low months. The sale of fluid products in quart containers reaches a peak in September and October and a low during April.

The seasonal pattern of sales made in pint containers shows that the largest amount of fluid products sold in pints is recorded in September while the smallest amount is sold during December. Half-pint sales during each year also have shown a pronounced and increasing seasonal pattern. October is the high month of half-pint sales while August is the low month.

The extremely low volume of milk sales in half pints during June, July and August reflects the termination of the school lunch program during the summer vacation, resulting in decreased milk consumption by school children in that container size. Sales in gallon containers are highest during March and usually lowest during November.

Sale of Milk at Retail and Wholesale, and in Paper and Glass Containers

While the range of consumer satisfaction usually is widened by affording both paper and glass containers of various sizes and making available several types of milk, the possibilities of increasing costs of packaging and distribution also are increased. Contributing to increased costs are dual packaging operations in glass and paper containers, the cost of the paper containers which are utilized only once and the extra equipment and time required to package in several container sizes.

To reduce packaging and distribution costs, some milk plant managers may contemplate eliminating glass containers and carrying on only paper delivery operations. Although published cost studies on the relative per unit savings in retail paper distribution over glass or dual paper-glass are not available, possible areas of savings by operating entirely with paper containers include the following: Breakage of filled bottles by routemen would be eliminated. Loading and unloading time would be reduced. There might be some savings in operating and repair costs of delivery trucks due to less weight of paper containers. Some housewives might take larger quantities of milk per delivery because of saving in refrigerator space from paper containers. Loss

TABLE 5. PERCENTAGE OF REGULAR AND HOMOGENIZED MILK SOLD AT WHOLESALE AND RETAIL DURING NOVEMBER, NORTH TEXAS MARKET, 1952-57

Point of sale	November 1952	November 1953	November 1954	November 1955	November 1956	November 1957
	----- Percent -----					
Wholesale	70.1	73.1	74.4	75.0	78.3	79.2 ¹
Retail	29.9	26.9	25.6	25.0	21.7	20.8 ¹

¹Estimated.

of bottles from failure of routemen to pick them up would be eliminated.

Studies in Wisconsin estimate that if these economies were reflected in per unit costs, savings of 1.1 cents per quart might result. This would represent distribution savings of about 22 percent by converting a dual operation to paper only for a milk distributor with dual operations whose retail distribution cost for a quart of milk in glass is 5 cents. This may be offset by the lower cost of glass containers that are used many times.

Price spread studies in New York indicate that costs of distributing wholesale milk in paper averaged 76.0 percent of the cost for wholesale milk in glass, while a study in California indicates that retail delivery expense for a paper quart is approximately .81 cent less than for a glass quart bottle.

Two of the greatest changes that have occurred in the dairy industry's distribution system during the past few years are the portion of total sales by handlers in retail and wholesale channels and the portion sold in paper and glass containers. Wholesale sales include deliveries to stores and institutions, and retail sales comprise milk delivered to homes by routemen. Data concerning the sale of regular and homogenized milk in wholesale and retail channels and the sale of these two products in paper, glass and bulk containers were obtained for November from 1952 through 1957.

Wholesale and retail sales in the three types of containers for 1952 through 1956 comprise audited data reported by every handler operating in the market. Data for 1957 are based on partially audited reports and are the best estimates available at this time.

Table 5 shows the percent of regular and homogenized milk sales that were made in whole-

sale and retail channels for November from 1952 through 1957.

Since 1952, the sale of milk in wholesale outlets has been increasing while retail sales have been declining. During November 1952, 70 percent of regular and homogenized milk was distributed at wholesale and 30 percent at retail. In November 1957, wholesale sales accounted for 79 percent of the total and retail sales, 21 percent. This reflects increased purchases of milk by housewives in the stores and less home delivery.

Table 6 shows the percentage of total regular and homogenized milk sold in both wholesale and retail outlets that was distributed in paper, glass and bulk containers. (The data shown for bulk include sales of homogenized and regular milk in 5 and 10-gallon containers only—gallon containers are included in the glass group.)

Sale of milk in paper containers increased from 53 percent of all regular and homogenized milk sales during November 1952 to 72 percent during November 1957. During this same period, the sale of packaged milk (regular and homogenized) in glass containers decreased from 46 percent in November 1952 to 25 percent in November 1957. At the same time bulk sales (dispenser sales and sales in 5 or 10-gallon cans to hotels, restaurants and institutions) of these two products increased from 1 percent to November 1952 to 2.6 percent in November 1957.

Table 7 shows the percentage of total wholesale and retail sales distributed in paper, glass and bulk.

Most significant in the trend indicated in Table 7 is the increased use of paper containers for both wholesale and retail sales. The sale of milk in paper containers represented 75 percent of the wholesale sales of regular and homogenized milk during November 1952, but by November

TABLE 6. PERCENT OF TOTAL REGULAR AND HOMOGENIZED MILK DISTRIBUTED IN PAPER, GLASS AND BULK CONTAINERS DURING NOVEMBER, NORTH TEXAS MARKET, 1952-57

Type container	November 1952	November 1953	November 1954	November 1955	November 1956	November 1957
	----- Percent -----					
Paper	53.0	55.7	60.3	67.8	70.9	72.0 ¹
Glass	46.0	42.9	37.9	30.4	26.9	25.4 ¹
Bulk	1.0	1.4	1.9	1.9	2.2	2.6 ¹

¹Estimated.

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TABLE 7. PERCENT OF TOTAL WHOLESALE AND RETAIL SALES DISTRIBUTED IN PAPER, GLASS AND BULK CONTAINERS DURING NOVEMBER, NORTH TEXAS MARKET, 1952-57

Type container	November 1952	November 1953	November 1954	November 1955	November 1956	November 1957
----- Percent -----						
Wholesale						
Paper	74.7	77.1	80.2	88.3	88.1	86.0 ¹
Glass	23.8	20.9	17.2	9.3	9.1	11.0 ¹
Bulk	1.5	2.0	2.5	2.5	2.8	3.0 ¹
Retail						
Paper	2.0	2.4	2.4	6.3	8.0	9.0 ¹
Glass	98.0	97.6	97.6	93.7	92.0	91.0 ¹

¹Estimated.

1955, this had increased to 88 percent. In November 1956-57, increased wholesale sales in glass and the decline in paper wholesale sales is caused partly by increased sales in glass-gallon containers through wholesale outlets. Sales in paper containers represented 2 percent of total retail sales in November 1952, but in November 1957, 9 percent of retail sales were distributed in paper containers.

The sale of milk in glass containers at both wholesale and retail decreased during the past 6 years. During November 1952, 24 percent of all the regular and homogenized milk sold at wholesale was in glass containers, but by November 1955 only 9 percent of sales were in glass. The sale of homogenized and regular milk at retail in glass containers decreased from 98 percent of the total in November 1952 to 91 percent in November 1957. Sales of regular and homogenized milk at wholesale in bulk containers increased from 1.5 percent of the total sold at wholesale in November 1952 to 3 percent in November 1957.

The substitution of paper for glass containers was accelerated by inaugurating longer milk delivery routes by some handlers and by an increase in the quantity of packaged milk moving long distances from packaging plants to point of sale. Some plant managers in the North Texas area have discontinued packaging milk in glass and are using only paper containers.

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