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## Changing Milk Product Consumption Patterns in Memphis, Tennessee

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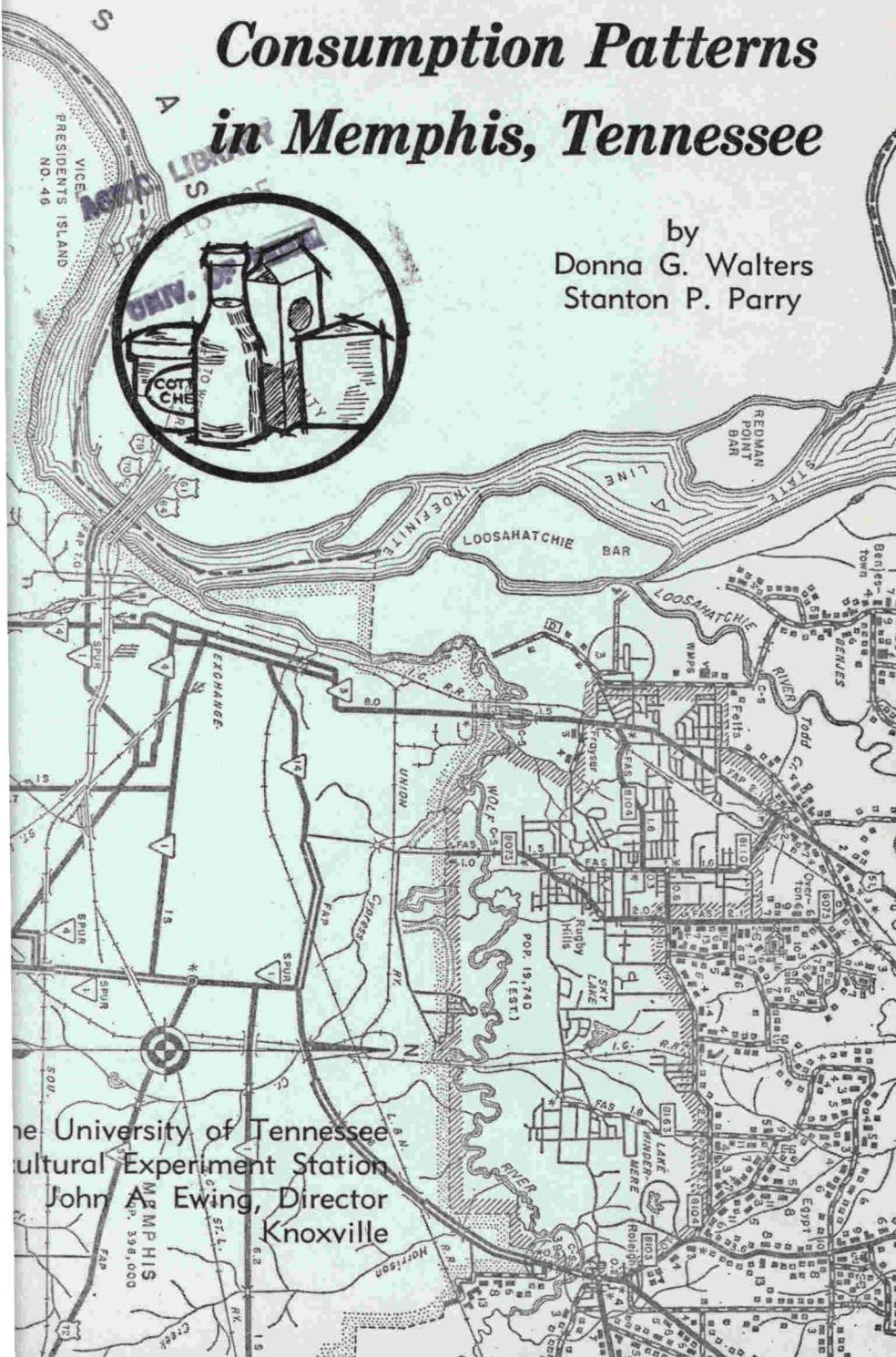
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# Changing Milk Product Consumption Patterns in Memphis, Tennessee

by  
Donna G. Walters  
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## Summary

As a result of low milk-product consumption, people associated with the Tennessee dairy industry have said they need more information about consumption patterns for these products. To help supply this need, a consumer survey was conducted in the Memphis Market in 1961. Part of the analysis included comparisons with a 1953 consumer study on the same market.

One change noted was that consumers were buying more milk from stores than through home delivery. A major reason for this shift was the widening spread between home delivered price and the retail store price. In 1953, there was no difference in these prices, but in 1961 the difference averaged 3 cents per half gallon and was as great as 21 cents per half gallon during part of the year.

**Fluid Whole Milk.** Concerning the fluid whole milk products, the general trends occurring were: a change from standard to homogenized milk, a preference for the half gallon container instead of the quart size, and a preference for paper over glass containers. The level of family income did not appear to have much effect on the percentage of families using fluid whole milk products. Nearly nine-tenths of the white households but only about three-fourths of the colored households had used homogenized milk in the week before the study. The median quantity for white households was  $5\frac{1}{2}$  quarts per week compared with  $3\frac{1}{4}$  quarts for colored households. Nearly one-fourth of the homemakers sampled said they would use more fresh fluid milk products if the price were lower.

**Skim Milk Products.** The proportion of the households in the sample using fluid skim milk in the week before the survey increased from 1% in 1953 to 6% in 1961. The increase was greatest among white households and among families with high or middle incomes. The percentage of the households using buttermilk decreased, especially for the colored families, but this decrease did not appear to follow any income pattern. Only 13% of the families surveyed indicated they would use more buttermilk if the price decreased. The percentage of households using nonfat dry milk in 1961 showed little change from 1953. The reason most often given for not using it was the same as in 1953—"We do not like the taste."

**Cream Products.** Use of the cream items appeared to be closely associated with family income. However, even in the group with high incomes, the percentage using these items had dropped since 1953. Approximately 10% of the homemakers indicated they would use more cream items if the price were lower.

**Cottage Cheese.** A higher percentage of white families used cottage cheese than did colored families, although the percentage of colored households using it had increased since 1953 from 7% to 13%. The percentage of white households using cottage cheese in the 7 days before the survey, 35%, had not changed since 1953. More families with high incomes used cottage cheese than did those with middle and low incomes.

**Butter.** The proportion of the households using butter had decreased from 39% in 1953 to 26% in 1961. The greatest decrease in use was in the low-income group, if classified by income, and in the colored group, if classified by race. The reason given most often in both 1953 and 1961 for using butter was a preference for the taste.

**Price Determination.** Nearly three-fourths of the homemakers sampled did not know how retail milk prices are decided. Of those who gave an opinion, one-third thought the price was set by milk companies. Only 6% of the homemakers sampled had ever heard of Federal Milk Marketing Orders, while 21% had heard of State Milk Control Laws. Even those who had heard of these agencies were not familiar with their functions.

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# *Changing Milk Product Consumption Patterns In Memphis, Tennessee*

by

Donna G. Walters, Stanton P. Parry<sup>1</sup>

## **Introduction**

Since the end of World War II per capita milk production and consumption have followed a downward trend. The gap between per capita production and consumption, though narrowed somewhat by government donations in recent years, began to grow again in 1959. The difference between per capita production and consumption excluding donations from Commodity Credit Corporation supplies was 40 pounds in 1959. By 1962, the gap had widened to 70 pounds per person (Fig. 1).

Faced with the problem of excess supply, many connected with the dairy industry indicated the need for additional milk utilization data.<sup>2</sup> The variety and type of such utilization data which could be collected are almost incalculable. With limited resources, however, it became important to select carefully those data which would, upon analysis, provide the most meaningful basis for decision-making in the dairy industry of Tennessee.

## **Statement of Problem**

Per capita consumption of milk and milk products in the South has been lower than in other regions. The United States Department of Agriculture reported annual per capita purchases of 55.5 quarts for the South during the July, 1957-June, 1958 period. The United States figure for the same period was 98.4 quarts. For other areas, the reported per capita purchases were: Northeast,

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<sup>2</sup>See for example: American Dairy Association, *Proceedings of Second National Symposium on Dairy Market Development* (Chicago: Market Research Department, October 30 and 31, 1961), p. 10.



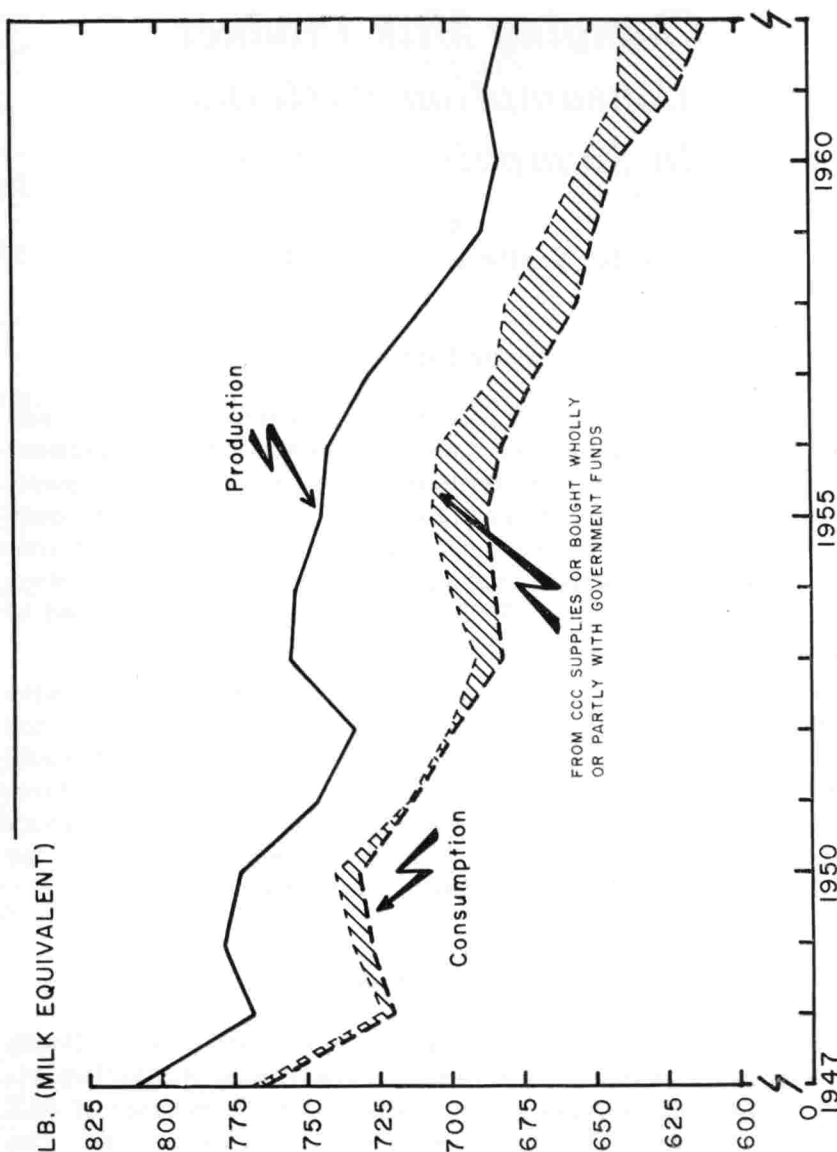


Figure 1. Production and consumption of milk per capita, United States, 1947-1962.  
Source: Dairy Situation, D. S. 292, ERS, U. S. Department of Agriculture, November, 1962.

120.8 quarts; North Central, 111.1 quarts; Mountain-Southwest, 86.6 quarts; and Pacific, 114.8 quarts.<sup>3</sup> Narrowing the problem, per capita consumption of milk products in Memphis, the largest

<sup>3</sup>United States Department of Agriculture, Agricultural Marketing Service, HPD-63, Household Purchases of Fluid Milk, Nonfat Dry Milk and Butter, by Regions and Retail Sales Outlets, April-June 1958, Table 1, p. 12.

city in Tennessee, has been continually lower than that of other areas of the South and the Nation. For the 1960-62 period, the per capita consumption of all fluid milk products in Memphis was 47% of that of Boston and only 70% of that of the relatively nearby Louisville-Lexington-Evansville area (Table 1).

Additional research might reveal some of the reasons for this differential and suggest possible ways that dairy farmers, producer organizations, processors, and distributors could increase their sales of fluid milk products. This report is based on economic judgment and does not attempt to evaluate minimum or maximum amounts which should be consumed from a dietetic standpoint.

**Table 1. Annual per capita consumption of all fluid milk products for selected marketing areas, 1960-1962<sup>a</sup>**

Marketing area	Per capita milk equivalent of all fluid milk products			Memphis consumption as a proportion of 1960-1962 average consumption for each area
	1960	1961	1962	
	Pounds			Percent
Boston	403	391	392	46.6
Philadelphia	289	276	275	65.8
Chicago	348	332	325	55.0
Kansas City	289	277	281	65.3
San Antonio	249	242	247	74.9
California (State)	314	303	296	60.6
Louisville-Lexington-Evansville	285	258	248	69.9
Knoxville	291	279	284	64.8
Memphis	180	176	197	100.0

a. Economic Research Service, United States Department of Agriculture, **Fluid Milk and Cream Report**, May 1962, 1963 and 1964. Milk equivalent of all fluid products.

### Scope and Method

In order to obtain information about the Memphis market in 1961, a household survey was conducted during a 2-week period in August and September, 1961. Since the results were to be compared with a 1953 United States Department of Agriculture survey, the 1961 field work was conducted during the same season and in the same manner as the earlier study.<sup>4</sup> A questionnaire was con-

<sup>4</sup>Milk consumption studies were made of the Memphis market in 1952 and 1953 by the United States Department of Agriculture, enabling comparisons to be made between the two time periods: P. B. Dwoskin, **Milk Products: Consumer Purchase Patterns and Use**, Bureau of Agricultural Economics, United States Department of Agriculture, Market Research Report No. 39 (Washington: United States Government Printing Office, 1953); and P. B. Dwoskin, J. A. Bayton, and W. S. Hoofnagle, **Changing Patterns of Milk Consumption in Memphis, Tennessee**, Marketing Research Report No. 69 (Washington: United States Government Printing Office, 1954).



structured similar to that used in the previous survey. Some of the same questions were used, but those no longer applicable were eliminated. Questions regarding products which had become more important or which had been recently developed were added for current analysis.

A stratified proportionate sample was used to study the population which was defined as all households within the Memphis city limits, as delineated in the 1960 Census of Population. The Bureau of Census had divided the city into 102 tracts or strata differing in race, income level, and value of housing (Fig. 2). The number of households sampled for each stratum was proportionate to its size in the total population of living units. Four hundred

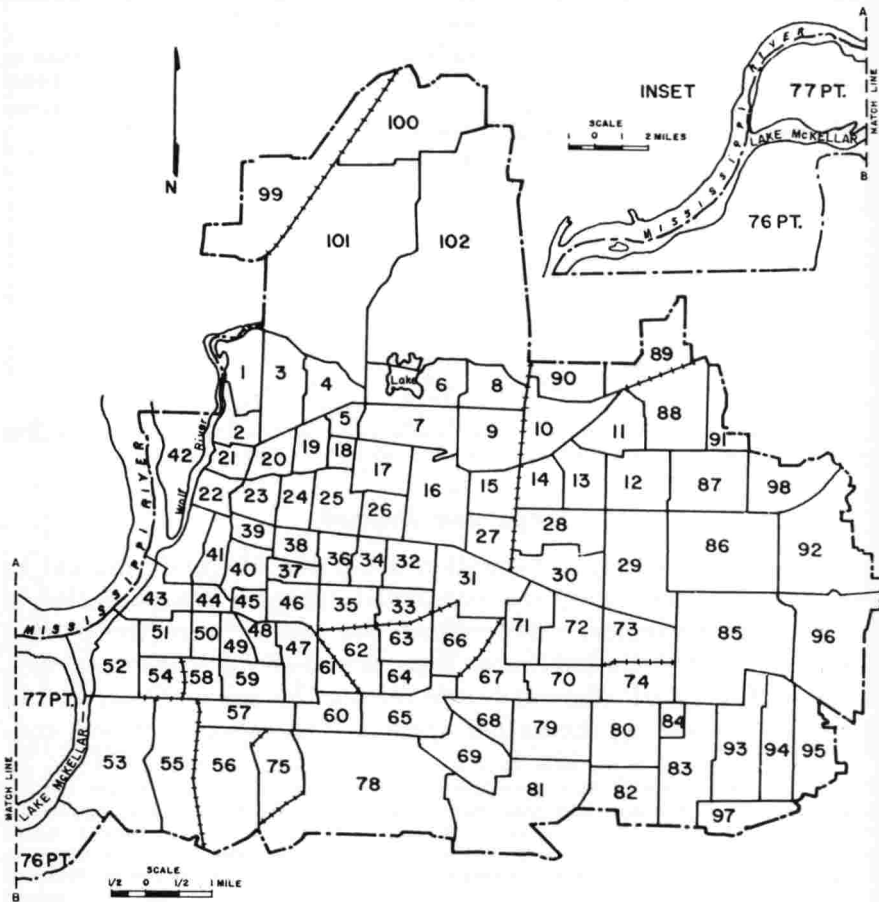


Figure 2. Memphis city showing Census tracts, 1960.

eighty households were sampled and the answers of the respondents provide the basis of this report.<sup>5</sup> This number of sample units made it possible to increase callbacks which made the sample more representative of the universe.<sup>6</sup>

The point of entry of each tract was randomly chosen. Every ninth household was interviewed until the required number of schedules for that tract had been taken. If the homemaker was not at home, two callbacks were made, one after 6 p.m., before substituting the household next door in the sample.<sup>7</sup>

This study was concerned with milk and milk product consumption rates as influenced by various factors in a relatively large Southern city. Items studied included: consumer preferences as to size and type of container, changes in milk product use, the effect of a major milk price war (spring and summer, 1961) on consumption, and the consumer's awareness of milk and milk product advertising. Data also were collected to determine consumer knowledge of various institutional arrangements prevalent in dairy marketing and consumer knowledge of milk price determination.

## **Changes in Milk Product Marketing Practices**

### **Type of Milk Product Used**

The proportion of Memphis households using homogenized milk during the week before the survey increased from 63% in 1953 to 85% in 1961, thus reflecting a large shift from cream-line milk to homogenized milk in this period (Table 2). Another change noted was in the use of less high-fat content milk products and more low-fat products. Further evidence of this preference for reduced fat was seen in the drop of the percentage using butter, from 39% in 1953 to 26% in 1961. The users of fluid skim milk increased from 1% of the households sampled in 1953 to 6% of those sampled in 1961.

<sup>5</sup>See Appendix on selection of sample and representativeness of sample.

<sup>6</sup>W. E. Deming, "On a Probability Mechanism to Attain an Economic Balance Between the Resultant Error of Response and the Bias of Non Response," *Journal of American Statistical Association*, Vol. XLVIII, December, 1953, "... the bias of non response is probably so serious in many if not most surveys that the specification of the number of recalls, and the adjustment of the original size of the sample . . . is an essential part of the sample design . . .," p. 745.

<sup>7</sup>"Homemaker" was defined as the person most responsible for the preparation of family meals, and was the person interviewed in most cases.

## Container Type and Size

Analysis of survey data for 1953 and 1961 also gave evidence of the trends toward greater use of half-gallon containers and paper containers for fluid milk. The 1953 survey revealed that 81% of the users of cream-line milk and 65% of the users of homogenized milk preferred quart containers, and only 12% of the users of cream-line milk and 25% of the users of homogenized milk preferred half-gallon containers (Table 3). In 1961, 28% of the users preferred quart-size containers for fresh whole milk items, while 68% preferred half-gallon size containers.

**Table 2. Households using selected milk products during seven days prior to each study, Memphis, Tennessee, 1953 and 1961**

Product used	1953	1961
	Percent of households using:	
Fresh whole milk	91	93
Cream-line milk	36	11
Homogenized milk	63	85
Extra rich milk	4	1
Buttermilk	53	43
Plain buttermilk	47	38
Bulgarian buttermilk	9	8
Chocolate milk drink	12	10
Cream items	18 <sup>a</sup>	24
Half-and-half cream mixture	5	7
Coffee cream (x)	10	9
Whipping cream (xx)	10	8
Sour cream	b	5
Fluid skim milk	1	6
Canned milk items	60	43
Condensed milk	10	8
Evaporated milk	58	39
Nonfluid items		
Nonfat dry milk	15	15
Butter	39	26
Margarine	83	88
Cottage cheese	28	28
Number of households	1535 <sup>c</sup>	480

a. Includes coffee and whipping cream only.

b. Product was not included in study for that year.

c. Weighted sample. In the 1953 U. S. Department of Agriculture study, weights were used to convert nonfat-dry-milk users to total households. For details see Agricultural Marketing Service, U. S. Department of Agriculture, Market Research Report 69, June 1954, p. 3.

**Table 3. Size of container preferred by homemakers whose families had used cream-line and homogenized milk, 1953, and fresh whole milk, 1961, during the 6 months prior to each survey, Memphis, Tennessee**

Container size preferred	1953		1961
	Cream-line milk	Homogenized milk	Fresh whole milk
	Percent of homemakers preferring:		
Quart	81	65	28
Half-gallon	12	25	68
Gallon	2	3	2
No preference	5	7	2
Number of households	709 <sup>a</sup>	1086 <sup>a</sup>	451

a. Weighted sample; some used both products.

**Table 4. Reasons given for preferring quart and half-gallon containers by the homemakers whose families had used fresh whole milk in the 6 months prior to the survey, Memphis, Tennessee, 1961**

Reason	Prefer quart containers	Prefer half-gallon containers
	Percent of homemakers giving reason for container size preference:	
Best for quantity used by family	55	28
Best of alternatives available	19	42
Handier for storage	7	9
Easier to pour and carry	7	2
Cheaper	6	14
Fresher	2	0
Just used to it, habit	1	2
Don't know	3	3
Number of households	121	306

Homemakers who stated a preference for quart-size containers gave several reasons for this preference (Table 4). The reason most often given in 1961 was that this size was best for the quantity of fresh whole milk used by the family. Reasons given for preferring half-gallon containers are also shown in Table 4. The reason most frequently given by homemakers for preferring half-gallon containers in 1961 was that it was the best of the alternatives available. Most users of fluid skim milk, buttermilk, and chocolate milk drink said they preferred quart-size containers. This was because they used smaller quantities of these products.

Respondents stated a preference for paper over glass containers for all types of fluid milk. The major reason given was the

same in 1961 as in 1953: the carton may be thrown away. However, several respondents stated that they bought products in the paper container because it was the only type available. The two reasons most frequently mentioned for preferring the glass container were: the carton causes the milk to taste like wax or gets wax in the milk, and cartons tear and leak easily. Since the time of the 1961 study, cartons coated in plastic rather than wax have been introduced in the Memphis market in an attempt to solve both of these problems.

### **Method of Purchase**

In the Memphis market at the time of the 1953 survey, 45% of the respondents indicated they were buying milk and/or milk products by home delivery; the percentage buying by home delivery in 1961 was 23%. Fluid whole milk, buttermilk, and chocolate milk drink were the products most often bought by home delivery.

Eight percent of the respondents in 1961 indicated they had discontinued home delivery during the previous year. More than half of those who quit buying by home delivery did so because the prices of the products were lower at stores. This price differential was as great as 21 cents per half-gallon of fresh whole milk during the price war of 1961 (Fig. 3). Another reason given was that the dairy from which they had bought milk no longer provided this service. Only two dairies continued home delivery in the Memphis area at the time of the 1961 survey.

The median quantity of homogenized milk used by homemakers who bought it by home delivery was 5.75 quarts per week compared with 4.11 quarts per week for those who bought homogenized milk at stores.

## **Factors Influencing Milk Product Consumption**

### **Promotional Activities**

Advertising has been recognized as one of the determinants of consumer demand. It is used by firms attempting to shift their demand schedule to a higher level, and by industry groups, such as the American Dairy Association, attempting to shift the industry demand schedule.



In studying the use of milk and milk products in Memphis, questions were asked consumers concerning the awareness of advertising activities and advertising slogans being used by the trade associations and individual brand milk companies in the Memphis area. Respondents who were aware of some advertising for milk, either an advertising activity or slogan, had dropped from 68% in 1953 to 63% in 1961. This is not a significant decrease as tested by Chi-square at the 95% level of probability.<sup>8</sup>

"June Dairy Month," a long-time cooperative advertising activity used in the months preceding June and throughout June, was the most widely recognized activity; 47% of the homemakers were familiar with it. "You Never Outgrow Your Need for Milk," a continuing slogan which is used throughout the year by the American Dairy Association, was recognized by 51% of the respondents. The large increase in recognition of this slogan between 1953 and 1961, 21%, gives some indication of the value of using an advertising slogan over a period of time.

The major medium for creating consumer awareness of advertising was television; it was mentioned by 60% of those aware of an advertising activity or slogan. The next most important medium was the store where milk was purchased, which was mentioned by 33% of those aware of milk advertising.

Only 5% of the respondents were able to name an advertising slogan which was used by a milk company. When asked to name a television program sponsored by a milk company, homemakers in the sample most frequently named "Looney Zoo," a children's cartoon show sponsored by one distributor.

It appears that the level of family income is associated with the awareness of advertising. However, the percentage aware of advertising at all income levels was less in 1961 than in 1953. The change was significant only in the low-income group (Table 5).

For every product except buttermilk and evaporated milk, a definite pattern between use and awareness of advertising may be seen (Table 6). Although not statistically significant in every case, more homemakers aware of an advertising slogan or activity used all products except buttermilk and evaporated milk. Among those aware and those not aware of advertising, both used evaporated milk in large cans.

<sup>8</sup>The word "significant" will be used in the remainder of this bulletin to mean significant as measured by Chi-square at the 95% level of probability.



**Table 5. Homemakers by awareness of advertising of milk products, by income groups, Memphis, Tennessee, 1953 and 1961<sup>a</sup>**

Recognition of milk product advertising	High income		Middle income		Low income		Total sample	
	1953	1961	1953	1961	1953	1961	1953	1961
Percent of homemakers								
Aware	76	75	68	58	54	43 <sup>b</sup>	68	63
Not aware	24	25	32	42	46	57 <sup>b</sup>	32	37
Number of households	649 <sup>c</sup>	239	489 <sup>c</sup>	125	397 <sup>c</sup>	116	1535 <sup>c</sup>	480

a. Awareness as used here means that the respondent recognized a milk promotion slogan or a milk advertising activity.

b. Difference is significant at 95% level.

c. Weighted sample.

**Table 6. Specified milk products used by members of households during the 6 months prior to each survey, by awareness or unawareness of advertising, Memphis,<sup>a</sup> Tennessee, 1961**

Product	Aware of advertising slogan or activity	Not aware of advertising slogan or activity
	Percent of households using:	
Homogenized milk	87	82
Plain buttermilk	36	39
Chocolate milk	16 <sup>b</sup>	4
Half-and-half cream mixture	9 <sup>b</sup>	4
Whipping cream	10 <sup>b</sup>	4
Coffee cream	12 <sup>b</sup>	4
Sour cream	6 <sup>b</sup>	4
Fluid skim milk	8 <sup>b</sup>	3
Evaporated milk		
Large cans	22	22
Small cans	16	19
Condensed milk	10 <sup>b</sup>	4
Nonfat dry milk	15	13
Butter	29 <sup>b</sup>	22
Margarine	89	86
Cottage cheese	32 <sup>b</sup>	20
Number of households	299	181
Percent of sample	62	38

a. Awareness as used here means the respondent recognized a milk promotion slogan or a milk advertising activity.

b. Significantly higher at 95% level than the percentage of those who were not aware of advertising and used this product.

The difference between those using buttermilk or evaporated milk in small cans and aware of an advertising slogan or activity and those using these products but not aware of an advertising slogan or activity was not significant.

## Family Income

**Product Use.** The influence of income on the type of milk product used in 1953 and 1961 may be seen in Table 7. At the

**Table 7. Specified milk products used by members of households during the 6 months prior to each survey, by income groups, Memphis, Tennessee, 1953 and 1961<sup>a</sup>**

Product	High income		Middle income		Low income	
	1953	1961	1953	1961	1953	1961
	Percent of households using:					
Homogenized milk	80	89	70	100	57	81
Cream-line milk	44	11	48	12	48	16
Extra rich milk	11	1	4	2	6	—
Plain buttermilk	57	48	70	52	55	50
Bulgarian buttermilk	25	17	18	10	21	4
Chocolate milk drink	31	29	34	24	30	11
Half-and-half cream mixture	17	13	7	9	4	5
Whipping cream	60	40	32	17	22	5
Coffee cream	30	19	15	7	10	3
Sour cream	<sup>b</sup>	32	<sup>b</sup>	10	<sup>b</sup>	3
Fluid skim milk	6	10	6	9	7	5
Evaporated milk	67	58	76	64	85	45
Condensed milk	35	30	34	19	21	18
Nonfat dry milk	23	19	32	20	25	15
Butter	49	42	47	28	44	12
Margarine	89	91	92	94	84	89
Cottage cheese	76	70	46	42	35	28
Number of households	649 <sup>c</sup>	237	489 <sup>c</sup>	125	398 <sup>c</sup>	118
Percent of sample	42	49	32	26	26	25

a. The range of annual gross family income within each group is as follows: 1953: High income—\$5,200 and over; Middle income—\$2,600-5,199; Low income—\$2,599 and less. 1961: High income—\$5,000 and over; Middle income—\$2,500-4,999; Low income—\$2,499 and less.

b. Sour cream was not included in the 1953 study.

c. Weighted sample.

time of the earlier study, homogenized milk seemed to be a "high-income" item. Also the cream items and cottage cheese were used by a much larger percentage of the households with high incomes. Evaporated milk was the only item used by a significantly greater percentage of the households with low incomes.<sup>9</sup>

Homogenized milk had come into general use by 1961 and the results of a changed attitude toward it may be seen in the data for that year compared with the data for 1953. A high percentage of all households, regardless of income, used this product in 1961.

<sup>9</sup>The range of annual gross family income within each group is as follows: 1953: High income—\$5,200 and over; Middle income—\$2,600-5,199; Low income—\$2,599 and less. 1961: High income—\$5,000 and over; Middle income—\$2,500-4,999; Low income—\$2,499 and less.

Consumption of four milk products appears to be closely associated with income levels. Trends in the use of butter, cottage cheese, coffee cream, and whipping cream are shown in Figure 4. Butter had definitely become an item used mostly by those with high incomes. Nearly half, or 49%, of the respondents with high incomes, had used butter during the 6 months before the 1953 survey. The percentages using butter during this period in the middle- and low-income groups were almost as high, 47% and 44%, respectively. In 1961 only 42% of the high-income households had used butter during the 6 months prior to the study.

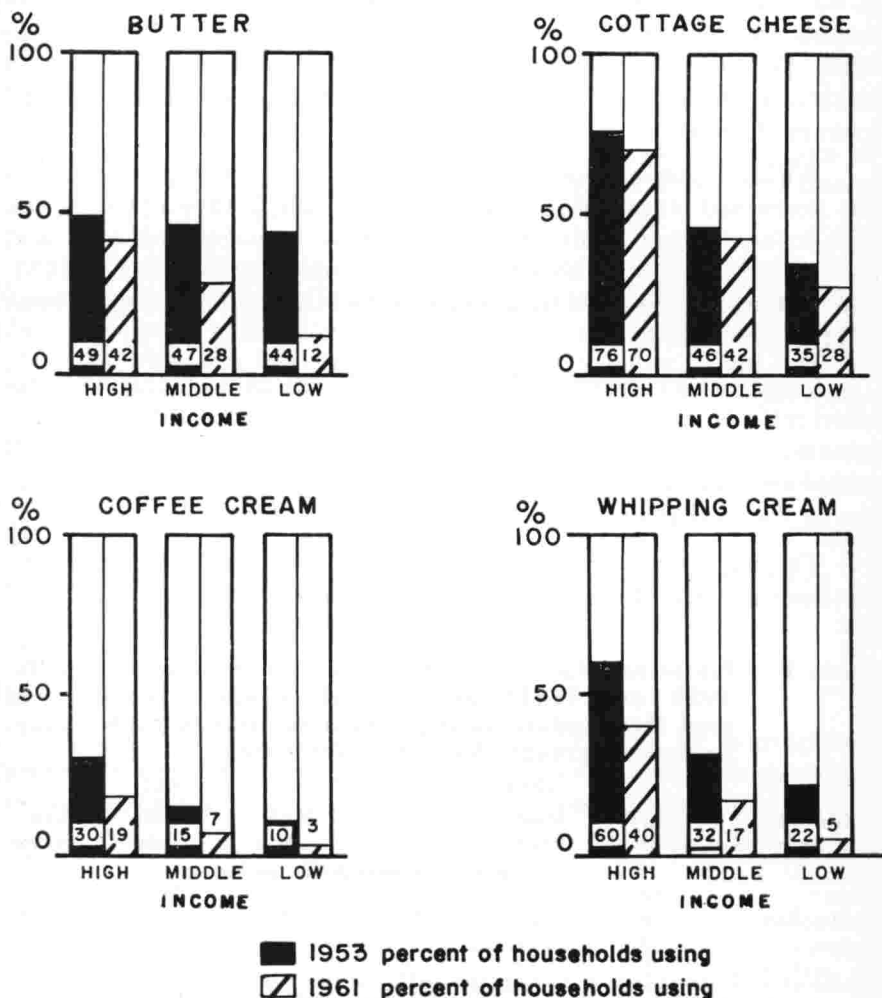


Figure 4. Percent of households using selected milk products by income group, Memphis, Tennessee, 1953 and 1961.

The decline in the percentage using butter in the other income groups was much greater. Butter was being used less even in the high-income group where the price differential should not be as important a factor.

Cottage cheese was another dairy product favored by households with high incomes. Seventy percent of high-income households were users of this product in 1961 vs. 28% for the low-income group.

The percentage of households using coffee cream has declined at all levels of income since 1953. Approximately 3% of the low-income group used this product in 1961 compared with 10% in 1953. For the high-income group the drop was from 30% in 1953 to 19% in 1961. The percentage using whipping cream also showed a sharp decline.

Within income groups, the percentage using nearly all products has decreased since 1953. For instance, Table 7 shows that in the high-income group, only two milk items—homogenized milk and fluid skim milk—were bought by more people in 1961 than in 1953. Margarine was also used by a larger percentage of all income groups in 1961 than in 1953.

**Container Preference.** More than 60% of those using homogenized milk in each income group stated a preference for quart containers in 1953 (Table 8). In 1961, the preference for quart containers was greatly reduced and a majority of each group preferred the half-gallon size.

The paper carton was preferred for fresh whole milk by 32% of those in both the high- and middle-income groups and 26% of

**Table 8. Preference for size of container for homogenized milk, 1953 and 1961<sup>a</sup>, by homemakers whose families had used this product during 6 months prior to each survey, by income groups, Memphis, Tennessee**

Container size preferred	1953			1961		
	High income	Middle income	Low income	High income	Middle income	Low income
	Percent of households preferring:					
Quart	66	62	69	25	20	47
Half-gallon	26	28	19	73	75	52
Gallon	3	3	2	3	4	<sup>b</sup>
No preference	5	7	10	1	1	1

a. 1961 data are for fresh whole milk which was almost all homogenized.

b. Less than 1 percent.

those in the low-income group in 1953 (Table 9). By 1961, the percentage of users of fresh whole milk preferring paper cartons had increased to 41% of those with high incomes and to 43% of

**Table 9. Preference for type of container for fresh whole milk by households using this product during the 6 months prior to each survey, by income groups, Memphis, Tennessee, 1953 and 1961**

Container type preferred	1953			1961		
	High income	Middle income	Low income	High income	Middle income	Low income
Percent of households preferring:						
Carton	32	32	26	41	43	43
Bottle	57	61	67	35	34	24
No preference	11	7	7	24	23	33

both the middle- and low-income groups. A larger percentage of those with high and middle incomes preferred glass containers, which were used mostly on home delivery routes.

**Method of Purchase.** The proportion of households with high incomes who bought milk products by home delivery in 1961 was 29% compared with 30% of those with middle incomes and 17% of those with low incomes. The percentage using home delivery shows a drastic drop from 1953 for each income level (Table 10).

**Table 10. Percentage of households who regularly purchased milk products by home delivery, by income groups, Memphis, Tennessee, 1953 and 1961**

Income group	1953	1961
Percent of households buying milk products by home delivery		
High	63	29
Middle	38	30
Low	25	17

The big drop in utilization of home delivery by high-income groups is most surprising, since the reason most often given by those homemakers discontinuing service was price (Table 11).

### Race of Respondents

**Product Use.** The median quantity of homogenized milk used in the 7 days before the 1961 survey for white households was 5½ quarts compared with 3¼ quarts for colored households. Among whites, 22% used 14 or more quarts a week, but only 4%

**Table 11. Distribution of reasons given by homemakers for changing from home delivery to store during the year, 1960 to 1961**

Reasons given for purchasing at stores	Percent of households <sup>a</sup>
Family size changed	5.5
Used too little	5.5
Rather not charge	2.8
Cheaper at the store	58.3
Poor delivery service	2.8
Store as convenient	2.8
All other reasons	36.1

a. Totals over 100% since multiple reasons were given by homemakers. Eight percent of the sample households discontinued home delivery service between 1960 and 1961.

of colored households used this much. It was found that 89% of the white households and 78% of the colored households had used homogenized milk in the week before the survey. Racial differences in milk product utilization are shown in Table 12. Because re-

**Table 12. Specified milk products used by household members during the 7 days prior to each survey, by race, Memphis, Tennessee, 1953 and 1961**

Product	Total sample		White		Colored	
	1953	1961	1953	1961	1953	1961
	Percent of households using:					
Homogenized milk	63	85	68	89	45	78
Plain buttermilk	47	38	31	33	81	49
Chocolate milk	12	10	10	12	17	6
Half-and-half cream mixture	5	7	6	9	1	4
Whipping cream	10	8	a	9	a	5
Coffee cream	10	9	a	11	a	4
Sour cream	b	5	b	7	b	1
Fluid skim milk	1	6	1	8	1	2
Evaporated milk	58	39	48	38	83	43
Condensed milk	10	8	10	9	4	6
Nonfat dry milk	15	14	15	14	15	15
Butter	39	26	34	31	50	16
Margarine	83	88	87	88	77	87
Cottage cheese	28	28	33	35	7	13
Number of households	1535 <sup>c</sup>	480	1133 <sup>c</sup>	329	402 <sup>c</sup>	151

a. Breakdown not available in 1953.

b. Not included in 1953 study.

c. Weighted sample.

spondents were asked to remember the quantity used for only 1 week, it is believed that the quantities are fairly reliable.

About one-third of the white households had used buttermilk during the week before the survey while nearly one-half of the

colored households had used this product. The medium amount of buttermilk used was essentially the same for both races. There has been a sharp drop in the percentage of colored households using buttermilk since 1953, which probably accounted for the decrease in the total consumption of buttermilk on the Memphis market.

The skim milk products as a group were used less by colored than by white households. Twice as many white households used chocolate milk drink as did colored households; 8% of the whites used fluid skim milk, but only 2% of the colored; the difference in the percentage of each race using nonfat dry milk was very slight. Thirty-five percent of the white households had used cottage cheese in the week before the survey compared to only 13% of the colored households. However, the percentage of colored households using cottage cheese has increased since 1953.

**Container Preference.** Preferences for container size by race and type of product are shown in Table 13. Seventy-three percent of the white users of fresh whole milk preferred half-gallon containers compared with 58% of the colored users. This preference may be attributed to the smaller per capita consumption of fresh whole milk by colored, partly due to income differences.<sup>10</sup> Colored households also preferred small containers for buttermilk.

### Competing Products

**Butter and Margarine.** Milk products compete not only with each other, as cream-line milk competing with homogenized, but with other products. Probably the greatest competitor with any milk product is margarine competing with butter. Since 1952, the per capita consumption of margarine in the United States has been higher than the per capita consumption of butter from commercial sources (Fig. 5). The 1961 per capita consumption of butter from commercial sources was 6.3 pounds, compared with the per capita consumption of margarine of 9.4 pounds.

In 1953, 92% of the respondents stated that they used margarine because it was cheaper. The price differential at that time was 49.6 cents per pound. The same reason was given by only 48% of the respondents in 1961 although the price differential was 47.7

<sup>10</sup>In 1960 the average annual income for white families was \$5,937 compared with \$2,777 for colored families in urban Memphis. United States Bureau of the Census, **United States Census of Population; 1960**. Final Report PC(1)-44C Tennessee General Social and Economic Characteristics (Washington: Government Printing Office, 1961), pp. 194, 199.



**Table 13. Size of container preferred for specified milk products by homemakers whose families had used these products during the 6 months prior to survey, by race, Memphis, Tennessee, 1961**

Container size	Fresh whole milk			Fluid skim milk			Buttermilk			Chocolate drink		
	White	Colored	Total sample	White	Colored	Total sample	White	Colored	Total sample	White	Colored	Total sample
Percent of households preferring:												
Quart	24	35	28	87	0	72	69	79	72	86	84	86
Half-gallon	73	58	68	0	100	17	24	19	22	3	0	3
Gallon	2	4	2	0	0	0	0	0	0	0	0	0
No preference	1	3	2	13	0	1	7	2	6	11	16	11
Number of households	312	139	451	30	6	36	187	81	268	94	19	113

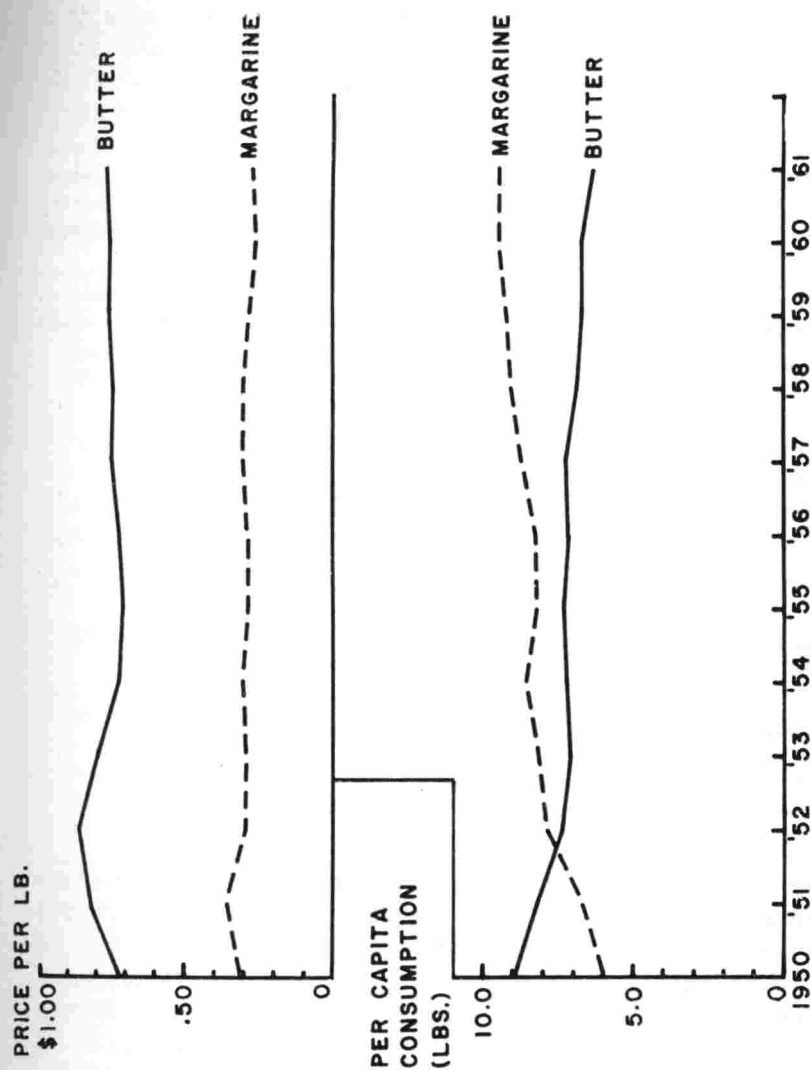


Figure 5. Average annual butter prices and margarine prices and changes in per capita consumption of these products, United States, 1950-1961.  
Source: Dairy Situation, D. S. 294, ERS, U. S. Department of Agriculture, February, 1963, and D. S. 296, June, 1963; Supplement for 1961 to Agriculture Handbook No. 62, ERS, U. S. Department of Agriculture, September, 1962, and National Food Situation, NFS-104, May, 1963.

cents per pound. The reason given most often in both 1953 and 1961 for using butter was a preference for the taste (Table 14).

**Fluid Whole Milk and Nonfat Dry Milk.** Another instance of one milk product competing with another is nonfat dry milk vying with fluid milk products. During the 1953-1961 period, the per capita consumption of nonfat dry milk in the United States increased 56%.<sup>11</sup> Seventy-eight percent of the users of nonfat dry

<sup>11</sup>Economic Research Service, United States Department of Agriculture, Dairy Situation, DS-292, p. 19.

milk stated they had no difficulty in mixing nonfat dry milk as a liquid. The product has been greatly improved, but the reason most often given for not using it was the same for both years—"We do not like the taste."

**Table 14. Reasons given for using margarine and butter by homemakers whose families had used these products during the 6 months prior to each survey, Memphis, Tennessee, 1953 and 1961**

Reasons	Butter		Margarine	
	1953	1961	1953	1961
	Percent of households stating each reason <sup>a</sup>			
Prefer taste, flavor	55	70	12	14
Just prefer it, like it	25	0	8	0
Better for you (health)	12	2	2	3
Use for guests, special occasions	12	5	0	0
Like it better for cooking, baking	10	19	11	19
Can afford it	6	0	0	0
Cheaper	0	0	92	63
It's an adequate substitute	0	0	17	2
Keeps better	0	0	30	1
Fewer calories	0	0	0	4
Other replies	0	0	0	4
Don't know	1	3	1	2
Number of households	721 <sup>b</sup>	151	1366 <sup>b</sup>	422

a. Add to more than 100% since some respondents gave more than one reason.

b. Weighted sample.

## Product Price

**Price Change.** Many of the homemakers did not know if there had been a change in the price of specified dairy products in 1961 compared with a year earlier (Table 15). Of those who had an opinion regarding the price in 1961 compared with a year earlier, the highest percentage thought there had been no change. Eleven percent of the homemakers were aware of a drop in the price of fresh fluid milk, but 26% thought the price had increased. Actually the price of homogenized milk dropped drastically during 1961.<sup>12</sup>

Most homemakers indicated they would continue to use the same amount of milk products even if the price dropped (Table 16).

**Price War.** More than half the homemakers, 52%, had noticed price changes due to a price war during the 6 months before the

<sup>12</sup>See Figure 3.

**Table 15. Opinion of homemakers regarding prices of specified milk products in 1961 compared to prices one year earlier, Memphis, Tennessee**

1961 price compared with 1960 price	Fresh fluid milk	Fluid skim milk	Nonfat dry milk	Butter-milk	Cream mixture	Coffee cream	Whip-ping cream	Cottage cheese
Percent of households stating that price:								
Dropped	11	0	1	1	0	0	0	1
Remained same	45	29	30	41	29	29	31	45
Increased	26	6	6	9	7	7	7	8
No opinion	18	65	63	49	64	64	62	46
Number of households reporting	477	474	473	474	472	471	472	473

survey. Sixty-eight percent thought the consumer benefited from the price war (Table 17). However, respondents were not so sure who lost. The highest percentage, 30%, thought that the farmer was the loser; 18% thought the milk company lost and 12% thought the retail grocer lost.

**Table 16. Opinion of homemakers regarding amounts of specified milk products they would use if price dropped, Memphis, Tennessee, 1961**

Opinion	Fresh fluid milk	Fluid skim milk	Nonfat dry milk	Butter-milk	Cream mixture	Coffee cream	Whip-ping cream	Cottage cheese
Percent of households stating milk product usage with price decline:								
Use more	24	5	6	13	8	9	13	10
Use same	73	58	58	63	56	57	56	67
Use less	0	0	0	0	0	0	0	0
No opinion	3	37	36	24	36	34	31	23
Number of households reporting	479	480	480	480	480	480	480	480

**Retail Price Determination.** Concerning the retail price of dairy products, homemakers were asked how these prices were decided. The largest percentage, 74%, said they did not know. Of those who gave an answer, 33% thought the price was set by milk companies. Other answers frequently given included "by supply and/or demand," "the farmer decides," and "the retail grocer decides."

The ranking of the influence of specified groups on the retail price of milk gave the following results, when ranked from most

**Table 17. Belief of homemakers as to who benefited and who lost as a result of a milk price war, Memphis, Tennessee, 1961**

Group	Believe benefited	Believe lost
	Percent of households:	
Consumer	68	5
Retail grocer	3	12
Milk companies	3	18
Dairy farmers	3	30
No opinion	23	35
Number of households	250	250

to least influence: 1) milk companies, 2) retail grocers, 3) government, 4) dairy farmers, and 5) consumers.

Homemakers of the sample were asked about government regulations in milk marketing. Surprisingly, only 6% had ever heard of federal milk marketing orders, although producer prices have been determined continuously by them on the Memphis market since October, 1960. More than half of those who recognized federal milk marketing orders did not know their function. Marketing orders regulate the price at the producer level only.

More of the homemakers, or 21%, said they were familiar with state milk control laws; almost half of these said the laws regulate the retail price, and about one-fifth said they control the quality and sanitation of milk. Actually, retail prices are not set directly by milk control laws in Tennessee, but retailers are prohibited by them from selling milk at less than cost.

### **Association of the Consumption of Milk Products with the Occurrence of Heart Disease**

During the months prior to the 1961 study, purported relationship between heart disease and the consumption of animal fats received wide publicity.<sup>13</sup> To check on the carry-over of this reporting, homemakers were asked if they had heard that "certain foods" cause heart disease. More than one-third, 37%, said they had heard this. This awareness seemed to be directly related to income, the high-income group being most aware. The source of knowledge most frequently mentioned was newspapers and magazines, fol-

<sup>13</sup>For example, in *Time* magazine articles concerning cholesterol appeared in the June 6, 1960, December 26, 1960, and January 13, 1961, publications.

lowed by other people telling them, and then by television and/or radio (Table 18).

**Table 18. Homemakers' sources of reports of influence of certain foods on heart disease, by income groups, Memphis, Tennessee, 1961**

Income group	Total aware <sup>b</sup>	Media <sup>a</sup>				Don't know
		Newspapers & magazines	Other people	Radio and television	Others	
		Percent of households				
High	47	38	30	10	9	22
Middle	34	26	30	26	5	23
Low	21	38	13	25	4	38
Percent of total sample	37	35	27	16	7	25

a. Some homemakers reported more than one medium.

b. Had heard that certain foods cause heart disease.

Of those homemakers who were aware of the reports that certain foods cause heart disease, 46% mentioned the influence of animal fats or cholesterol; 15% said they had heard that milk consumption influenced heart disease.

A high percentage, or 86% of the homemakers who had heard of a relationship between some foods and the occurrence of heart disease, said this had not affected their buying habits. However, 19% of those with high incomes had changed their consumption pattern for milk products since they had become aware of the reported association between milk products and heart disease. Only 5% of the middle-income group and 8% of the low-income group had reported changes in their milk consumption habits. These limited data would indicate that as of September, 1961, the heart disease problem had not overtly affected the habits of most Memphis milk consumers.

### Economic Implications

The dairy industry needs to be constantly in search of ways to alleviate the problem of milk surpluses. This study suggests that there are several ways in which the sales of milk and milk products might be increased on the Memphis market. Many of the ideas presented here may apply over a much wider area.

It has been shown that households which take homogenized milk by home delivery consume more of it than households who do

not. Yet many Memphis distributors have abandoned this service and tied themselves completely to sales to retail stores. Thus they have lost all direct contact with the actual consumers of their product. This in itself is not bad, but it does reduce the distributor's bargaining power for his product as he faces one or a few buyers vs. the many buyers on the home delivery sales route. Since many consumers do prefer this service and are willing to pay for it, Memphis distributors should attempt to hold or expand home delivery routes wherever possible. The recent introduction of home dispensers could mean that more large consumption households could be serviced by home delivery of milk in these bulk containers.

The half gallon container had become the most important type of unit for two-thirds of Memphis consumers of fluid whole milk by 1961. The nonuse of gallon-size containers was evident in 1961. Even by mid-1964 only one handler offered a gallon-size package and there were no gallon jugs or gallon twin-paks on the Memphis market. The use of multiple unit containers leads to larger per capita consumption and should be considered for use on the Memphis market. Federal order data for Knoxville dated May, 1962, revealed that 40% of the homogenized milk sold in paper containers was in twin-pak gallons. Multiple unit sales should offer similar possibilities for Memphis.

Colored households consumed less milk than white Memphis households. Since colored households made up 37% of the total Memphis population in the **1960 Census**, promotion aimed at this segment of the population should help increase fluid milk sales.

With the present high price of butter relative to margarine and the preference for low-fat items, butter consumption will probably continue to decrease. Promotion aimed toward those who already prefer the taste of butter should be more effective in holding the present level of consumption than promotion aimed toward those who would have to develop the taste. Many household members born after World War II have never tasted butter in the home. Advertising telling of the distinctiveness and prestige value of butter could be placed in media directed toward the high-income group who are currently high butter consumers and who are not as affected by price as those with lower incomes.

The great popularity of television watching and the snacks that invariably go with this pastime encourage the consumption of



fancy foods such as sour cream in dips and for dressings. Five percent of the households sampled had used this product during the 7 days before the 1961 survey. Homemakers said they used sour cream in special recipes. Those who did not use it said they had no need for it or some members of the household did not like it. Advertising informing of the varied uses of sour cream could create a desire for it in more households.

Most users of cottage cheese—95%—stated they had no difficulty obtaining high-quality cottage cheese. In fact, 44% of the homemakers replying stated that they could keep it in their refrigerator 5 days or more. With good quality cottage cheese and the type desired available in the size of container preferred, as also indicated in this survey, the dairy industry has a good basis for expanding the consumption of this product. Perhaps education in new ways of using cottage cheese would be helpful in developing the market for this high-protein, low-fat item. It is understood that since the 1961 survey this product has been emphasized more in Memphis.

The people in the dairy industry will need to continue to be aware of the changing preferences of the population and develop new products as needed to meet these changes.

Consumer education on price determination and on the purposes of federal milk orders and state milk control laws would seem to be profitable. Very few homemakers were acquainted with the operation of federal and state regulatory agencies. Yet these institutional arrangements do operate as a price-making force on the Memphis market, and homemakers or their representative groups have a right under the law to testify at public hearings promulgating or revising federal milk orders.

## Appendix

### Choice of a Sample for the Memphis Milk Consumption Survey, 1961

#### I. Sample Size

The following formula was used to calculate the sample size needed for estimation of a proportion of units possessing a certain attribute within a designated confidence range:<sup>1</sup>

$$N = \frac{t_{.95}^2 P Q}{E^2}$$

where:  $N$  = number of cases required in the sample

$P$  = the frequency of occurrence of the phenomena measured (favorable occurrences)

$Q$  =  $1-P$  (unfavorable occurrences)

$E$  = maximum allowable error in percentage points (permissible error or tolerance)

$$t_{.95} = 1.96$$

This formula may be used to compute sample sizes with a confidence limit of 95%. If it is assumed that  $P$  is equal to .5, which gives a maximum standard error, to have a low and allowable error of .05, then the sample size would have to be 384. The error of .05 is the vacillation on either side of our estimate of the proportion buying a commodity. Actually the frequency of occurrence for some of the questions was as high as 95%; that is, some milk products are used by as many as 95% of the households. Using  $P$  equal to .95, only 456 sample households would be needed to have errors as low as  $\pm 2$  percent.

The actual sample size selected was 480 households which is an increase of about 100 over the 384 required with an allowable error of .05 and  $P$  equal to .5. This is to compensate for the approximations used in arriving at the sample since such expansion was possible with the time and funds available. A larger sample could have been taken, but as noted earlier, this would not have allowed the number of callbacks deemed necessary.

<sup>1</sup>William G. Cochran, *Sampling Techniques* (New York: John Wiley and Sons, Inc., 1953), p. 54.

## II. Representativeness of Sample

The social and economic characteristics of the sample households were compared with those for urban Memphis given in the U.S. Census of Population, 1960.<sup>2</sup> Some of the characteristics could not be compared exactly.

Families were divided according to race, size, and income. The mean number of persons for all sample households was 3.43. For the city of Memphis this figure was 3.42. The sample average family size was not significantly different from the total population of Memphis as tested by "Student's t" at the 99% level of significance.

The sample was 68.5% white. The census gave a comparable figure of 63.3%, a difference which was significant at the 95% level. The explanation for this difference is not known. Apparently, when entering tracts with both white and colored households, more random starts occurred in white areas.

The educational level for the sample appeared to be higher than for the city of Memphis. However, an accurate comparison between educational levels of sample homemakers and the categories listed for the census was not possible.

In comparing the sample income information with that given in the census, it was necessary to assume that incomes were evenly distributed in the census data since incomes were divided by thousands of dollars in the census but two-and-one-half thousand in the sample. By linear interpolation, census data were divided so that sample information would be comparable to it (Table 19). At the 95% level of significance, none of the income levels of the sample is significantly different from the census data.

<sup>2</sup>United States Bureau of the Census, op. cit.

**Table 19. Income of households of the sample as compared with incomes reported by the Census of Population, 1960, Memphis, Tennessee**

Income	Census	Sample Percent of households	$t_{95} = 1.96$ Sample t score
Less than \$2,500	21.4	24.2	+1.58
\$2,500-4,999	29.6	26.3	-1.80
\$5,000-7,499	24.8	25.0	+0.22
\$7,500-9,999	13.0	13.4	+0.22
\$10,000 or more	11.2	11.1	-0.05

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