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Russell L. Childress, B. S.

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CONSUMERS' ATTITUDES TOWARD SOME
ECONOMY MEASURES IN RETAIL
MILK DELIVERY, ROANOKE,
VIRGINIA,
1947

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CONSUMERS' ATTITUDES TOWARD SOME ECONOMY MEASURES IN RETAIL MILK DELIVERY,

ROANOKE, VIRGINIA, 1947

PROBLEMS STUDIED AND METHOD OF PROCEDURE

Introduction

In 1946, the nation's bill for marketing dairy products amounted to 2.28 billion dollars.^{1/} This accounted for 41 percent of the retail price of dairy products to consumers. The retail price per quart of fluid milk for the United States in July, 1947 was 18 cents. Of this amount, six cents, or one-third, was paid for marketing charges. Selling and delivery costs were by far the most important items in this marketing margin charged consumers for distributing milk. In a recent study, Dr. Spencer found that selling and delivery costs represented 30 percent of the consumers' price for retail-delivered milk and accounted for nearly two-thirds of the total expenses of handling, processing and distribution.^{2/}

The practice of delivering milk to the consumer's doorstep has received considerable and widespread attention because of the high costs entailed. It goes without saying that more efficient use of labor and equipment for this purpose is desirable. However, it was not until the recent national

^{1/}The Marketing and Transportation Situation, Sept., 1947, U.S.D.A., B.A.E., M.T.S.-57, pp. 13 and 16.

^{2/}Spencer, Leland, Costs of Delivering Milk in the New York-New Jersey Metropolitan Area, A Preliminary Report, Cornell University, Bul.A.E., 528 Sept. 1945, p. 7.

emergency that any important economies in milk delivery were effected. Economies were forced upon the industry, not because they were desirable, but because it was imperative that a reduction be made in both labor and equipment use, so that more effort could be directed toward the prosecution of the war.

Students of dairy marketing had advanced a number of ways designed to improve the system of milk distribution. Some of these adopted during the war-period were: Alternate-day delivery, the elimination of special deliveries and call-backs for collecting bills, the elimination of pint bottles in the retail trade, daylight deliveries on retail routes, and a deposit charge on all glass bottles delivered to wholesale customers. The most important of these economy measures was the plan for alternate-day delivery.^{1/}

As in most milk markets of the United States, Roanoke instituted these practices because of the wartime shortages. Due to the acute need for conserving man power, gasoline, rubber, and equipment, the government required a reduction of 25 percent in mileage traveled for the purpose of milk delivery. The order, issued by the Office of Defense Transportation, was placed in effect on the Roanoke market in the summer of 1943. All dealers complied with this order by adopting a system of less than every-day delivery, either in the form of every-other-day, three-day, or four-day per week deliveries.

Purpose of the Study

The purposes of this study were two-fold: First, to determine the

^{1/}Spencer, Leland, Wartime Economies in Milk Delivery, Cornell University, Bul. A.E. 528-A, Sept., 1945, p. 3.

reaction of consumers toward certain wartime economy measures in milk delivery service and their continuance; and second, to measure homemakers' attitudes toward other possible economies in milk delivery services. If a majority of the customers taking milk from retail routes have a strong preference for daily delivery and other more elaborate services furnished before the war, and if they are willing to pay the additional costs, more milk will be sold by reverting to that type of service. On the other hand, if they desire to continue the economical practices now in effect, producers, as well as consumers, distributors, and milkmen would be benefited by retaining these practices.

Some Facts Concerning the Roanoke Milk Market

According to the Virginia Bureau of Vital Statistics, the City of Roanoke had a population of 69,287 persons in 1946. Of this total, 56,472, or 81 percent, were white and 12,815, or 19 percent were Negroes. At the time of the survey, four distributors were serving the Roanoke market within the city limits. There were no producer-distributors, due to a city milk ordinance prohibiting the sale of raw milk within the city.

During October, 1947, the retail price of milk delivered to the consumer's doorstep was 19 cents. The store price was 20 cents in practically all cases, except a few, which were 21 cents. However, as a result of a hearing by the Virginia State Milk Commission, the retail price has been advanced to 21 cents for retail delivery and 22 cents for store sales.

Source and Scope of the Data

Homemakers' reactions toward war-time and other possible changes in

milk delivery were obtained^{1/} during October, 1947 by personal visits with 198 families in four selected areas of the City of Roanoke (figure 1).

In 1940, the City of Roanoke had 17,719 dwelling units,^{2/} of which 14,905, or 83 percent, were occupied by white families and 3,013, or 17 percent, by Negro families.^{3/} A breakdown of the white families showed 5,144, or 35 percent, had a contract or estimated rent ranging from under \$5 to \$19 per month, averaging \$13. About 7,775, or 53 percent, paid rents ranging from \$20 to \$49 per month, averaging \$32, and 1,800, or 12 percent, with \$50 and over per month, averaging \$67. The average contract or estimated rent for the Negro families was \$12 per month.

The sample areas were selected on the basis of rentals.^{4/} Most of the families with rentals from \$4 to \$19 were living in Area 1, located along Campbell, Kirk, and Church Avenues between 12th and 17th Streets. The greater portion of families with rentals from \$20 to \$49 were living in Area 2, located along Staunton and Hanover Avenues between 20th and 25th Streets. Practically all of the families with rentals of \$50 and over were found in Area 3, located along Longview, Avenham, and Wycliffe Avenues between Broadway and 27th Streets. All Negro families were living in Area 4, located along Gregory Avenue between 2nd and 6th Streets.

The families visited represented all levels of income, and both white and Negro racial groups. The sample areas included 198 families, or one

^{1/}A copy of the questionnaire used is included in the appendix.

^{2/}Dwelling unit is the living quarters occupied by, or intended for occupancy by one household.

^{3/}United States Census, Housing, Third Series, 1940, p. 43.

^{4/}United States Census, Housing Block Statistics for Roanoke, Virginia, 1940.

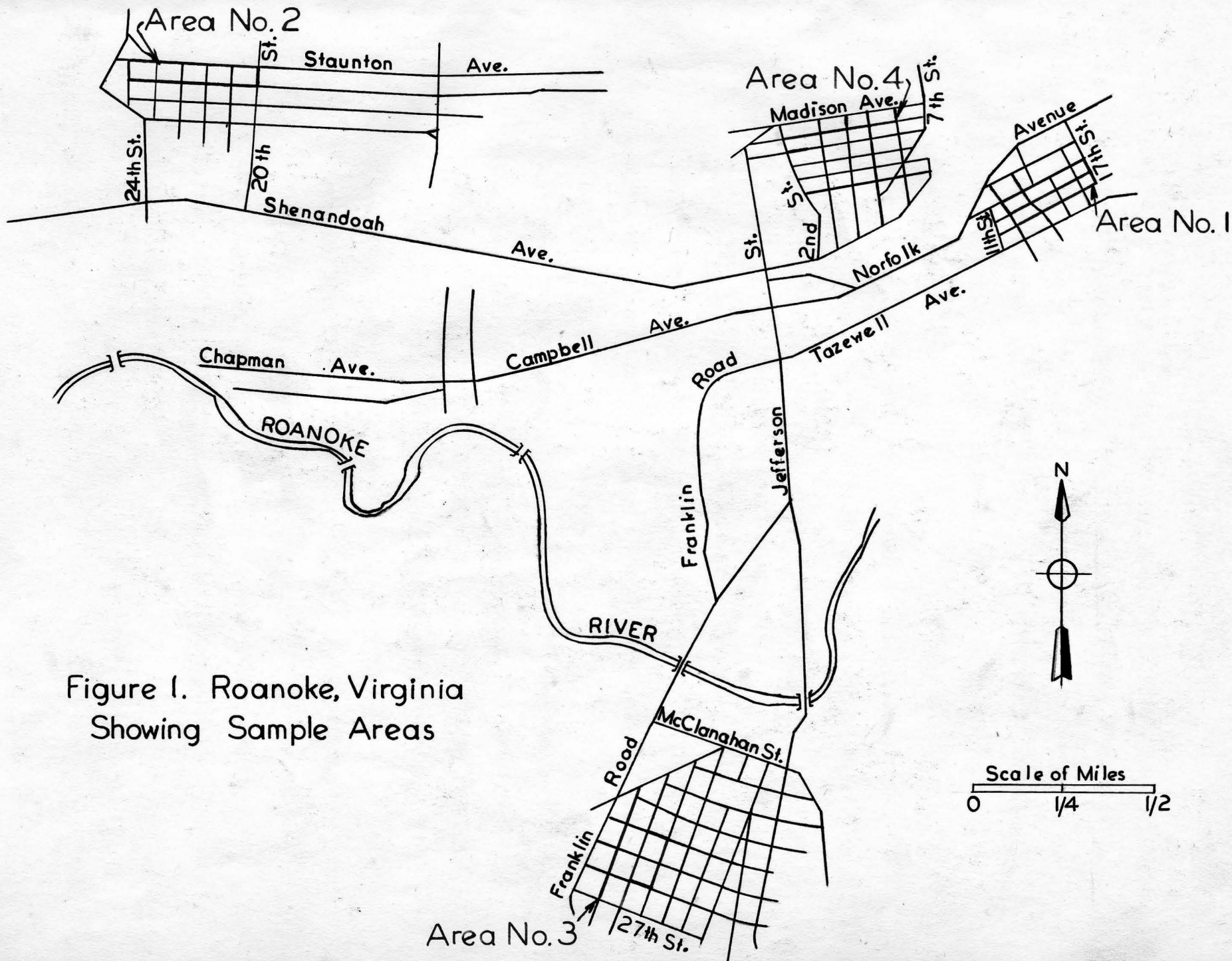


Figure 1. Roanoke, Virginia
Showing Sample Areas

percent, of all families in the city. One-hundred and fifty families, or 76 percent, were white and 48, or 24 percent, were Negro. Of the 150 white families, 53, or 35 percent, had an average contract or estimated rent of \$17 per month; 56, or 38 percent, \$35; and 41, or 27 percent, \$64 per month. The average contract or estimated rent for the Negro families was \$14 per month.

This comparison shows that a fair cross-section of the total population was obtained, insofar as income based on rental is concerned. Since time did not allow for more than 200 families to be included in the survey, and this number would not allow for sufficient records in each income and racial group to be weighed on the same proportions as the total population, it was felt that this sample would give the most reliable results. The sample might have been improved, if as many as 1,000 families had been included in the sample.

All occupied dwelling units located in the four sample areas were contacted, except for those away from home at the time the visits were made. Those not present for the interview on the first attempt were visited a second, and in many instances a third time. In spite of the third attempt, some families in the sample areas were never contacted. A total of 198 families, consisting of 763 persons, representing a little over one percent of the total population, was interviewed. In all cases the homemaker gave practically all of the information asked on the questionnaire. Two additional families were contacted but due to incompleteness of these records they were discarded.

The summaries presented herein are believed to be unbiased and, therefore, represent the true opinions of those interviewed, as they were at the

time of the study.

The survey was conducted by the writer during the first three and one-half weeks in October, 1947.^{1/} Homemakers were asked to report all fresh milk and milk products purchased during the seven days prior to the date of the interview, as well as the source and type of milk delivery services obtained.

Families Included in the Survey

It is known from previous studies that consumers' opinions, as well as their demand for milk delivery services, are influenced by such factors as income, race, size of family, and source of milk. This survey attempted to obtain information pertaining to all of these factors from each of the families interviewed.

No grouping of nationalities was made since practically all of the population were native white or Negro. A racial grouping was made because a large proportion of the population was Negro.

Income

In addition to rent, each homemaker was asked to check one of 12 income groups most nearly approximating the family income for 1947.^{2/} The lowest of these income groups included families with less than \$25 a month, and the highest, more than \$435. Family income was derived by taking the mid-point of the income group checked, except in cases where the exact family income was given. Forty-seven families did not report their family income during

^{1/}W. G. Merrett, Secretary, Roanoke Milk Board, interviewed seven families.
^{2/}A copy of the income-group sheet is included in the appendix.

the interview. A second attempt was made to obtain this information by sending a letter to each of these homemakers, requesting they check the income group most nearly approximating their present income.^{1/} Sixteen families responded, leaving 31, or less than 16 percent of the 198 families interviewed with no information on income. In all cases where income was not reported, the occupation of each member of the family contributing to the family income was obtained. Family income was estimated, on the basis of occupation, by a banker with over 22 years experience. With his knowledge of the thousands of persons of different occupations depositing their monthly income in the bank, a banker was thought to be the best qualified person to make these estimates.

The average monthly income of the 198 families was found to be \$220 (table 1). Fifty-three, or 35 percent, of the white families had incomes of less than \$176 a month. Forty-one had incomes of more than \$349. The middle income group, with incomes from \$175 to \$349, consisted of 46, or 38 percent, of the white families. Negro family incomes ranged from \$10 to \$225 with an average of \$109 per family. The average per capita monthly income was \$36 for low white; \$63 for middle white; \$107 for high white and \$31 for Negroes.

Size of Family

The average number of persons per family for all groups was 3.9 persons.^{2/} As would be expected, the white families in the low income group

^{1/}A copy of this letter is included in the appendix.

^{2/}Includes boarders and servants eating in the household in addition to members of the family at home.

Table 1.- Family income groups showing number of families, average monthly income, average per capita income, and number of persons per family in each

Income (dollars monthly per family) ^{1/}	Fam- ilies	Average monthly income per family	Average monthly income per capita	Average persons per family	Proportion of families in each income group consisting of -				
					1 person	2 persons	3 or 4 persons	5 or 6 persons	7 or more persons
<u>Group</u>	<u>Number</u>	<u>Dol.</u>	<u>Dol.</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:									
Low income (\$55 to \$175)	53	147	36	4.1	2	17	47	26	8
Middle income (\$176 to \$349)	56	247	63	3.9	2	12	54	29	4
High income ^{2/} (\$350 and over)	41	407	107	3.8	-	20	58	17	5
Negro:									
All (\$10 to \$225)	48	109	31	3.5	4	31	42	17	6
All groups	198	220	57	3.9	2	20	50	22	6

^{1/} Incomes were estimated for 31 families.

^{2/} Of the 41 families, 25 had incomes of over \$435 per month.

had the largest number of persons per family. The middle income group had the next largest number, with 3.9 and the high income group had 3.8 persons per family. Over one-half of the 41 families in the high income group had a maid or servant, which accounts for this average being so high. The smallest number of persons per family was 3.5, which was in the Negro group.

Families with three or four persons made up the most important group, and represented 50 percent of the total. The next most important sized group consisted of five or six persons, and made up 23 percent of the total. Families with two persons represented 20 percent, those of seven or more six percent, and one-person families made up only two percent of the total.

There was an inverse relationship between per capita income and size of family. The size of families in the three white income groups decreased as the per capita income increased. This accounts for the per capita income increasing at a faster rate than monthly income.

These factors of income and size of family should be kept in mind throughout the following analysis and discussion, because they are, to a great extent, responsible for consumers' attitudes toward milk delivery service.

Whenever the husband was present, he was asked to voice his viewpoint on questions involving an opinion. The homemaker was interviewed in every case where possible. Other members of the family were interviewed in only five cases.

Distance to Nearest Store Selling Milk

Seventy-seven percent of the Negro families lived less than one block from a store selling milk, as compared with only two percent of the white

families in the high income group (table 2). Slightly less than one-fifth of the white families in the low income group lived less than one block from a store selling milk, in contrast to only four percent of the middle income group.

All of the Negro families lived less than three blocks from a store selling milk, as compared with a little over one-third of the white families in the high income group. Less than two-thirds of the white families in the middle income group lived within three blocks of a store selling milk, in contrast to over four-fifths of the low income group.

Less than one-fifth of the white families in the low income group lived three blocks or more from a store selling milk, as compared with over one-third of the middle income group, and over one-half of the high income group.

In terms of estimated walking time between home and nearest store selling milk, a little less than two-fifths of the Negro families lived less than one minute away, and all Negro families lived within a three minutes walk to a store selling milk.

There is a definite relationship between the white family income groups and the estimated walking time to the nearest store selling milk. As the family income increased, there was a corresponding decrease in the percentage of families living one to three minutes to the nearest store selling milk, from 62 percent in the low, to 36 percent in the middle, and only 17 percent in the high income group. The reverse is true for the proportion of families living nine minutes or more away, with the percentage increasing from low to high from 2 percent to 11 percent and 29 percent.

Table 2.—Relation of family income to number of blocks and estimated walking time between home and nearest store selling milk

		Proportion of families reporting number of blocks and walking time between home and nearest store selling milk to be—							
Family income	Families	Less than one block	One or two blocks	Three or four blocks	Five blocks or more	Less than one minute	One to three minutes	Four to eight minutes	Nine minutes or more
Group	Number	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
White:									
Low	53	19	62	19	-	-	62	36	2
Middle	56	4	60	32	4	-	36	53	11
High	41	2	34	56	8	-	17	54	29
Negro:									
All	48	77	23	-	-	39	71	-	-
All groups	198	25	46	26	5	7	47	36	10

Source of Milk

One-hundred eighty-three, or 92 percent, of the total families included in the survey, reported having purchased fresh milk at least once during the seven days prior to the time of the interview (table 3). Slightly less than two-thirds of the total number of families, or 63 percent, had all their milk delivered by one of the four milk dealers. About one-fourth purchased all milk from stores, and only nine families, or five percent, made both retail route delivery and store purchases. It is significant to note the rather large number of families buying at stores, since milk sold for one cent, or two cents in a few cases, more at the store than off the milk truck. Only two families interviewed were purchasing milk from farms.

Ninty-three percent of the white families in the high income group had all their milk delivered, compared with slightly over one-half of the families in the low income group. One-third of the Negro families had their milk delivered. Only one, or 2 percent, of the 41 white families in the high income group supplemented their delivery service with store purchase, in contrast to six, or 11 percent, in the low income group. In the middle income group, four-fifths of the families, or four percent, supplemented their delivery service with store purchases. It may be concluded that there is a significant relationship between family income and source of milk. As family income increased, the percentage of doorstep deliveries increased, while the percentage supplementing retail delivery service and the proportion buying at stores decreased.

There is no great variation between the source of milk and size of

Table 3 .--Relation of family income to source of milk

Family income	Families	Proportion of families in each group--				
		Having all milk delivered	Reporting delivery and store purchases	Buying entirely from store	Buying entirely from country	Buying no milk
Group	Number	Percent	Percent	Percent	Percent	Percent
White:						
Low	53	51	11	32	2	4
Middle	56	80	4	14	2	-
High	41	93	2	5	-	-
Negro:						
All	48	33	-	40	-	27
All groups	198	53	5	23	1	8

family. The families with four persons (both white and Negro races) depended somewhat more on retail milk delivery (table 4). As the size of families in the white race increased above three persons, there was a corresponding increase in the percentage of those buying from stores. Over one-fourth of the Negro families purchased no milk during the seven-day period, compared with less than two percent for the white families.

It was felt that the distance between the home and the nearest store selling milk might be a factor influencing the homemakers' source of milk. The 126 families receiving retail delivery service only were located an average of 2.3 blocks, or an estimated walking time of 4.6 minutes, from the nearest store selling milk, compared with one block, or an estimated walking time of 1.8 minutes, for the 61 families buying entirely from stores (table 5). The nine families buying from both retail trucks and stores were living two blocks, or an estimated walking time of 3.8 minutes away from the nearest store selling milk. Only 13 percent of the families buying milk from the milkman were less than one block from a store selling milk, compared with over 50 percent of those buying from store only. Almost two-fifths of the families receiving solely doorstep delivery were located three blocks or more away from a store selling milk, in contrast with only seven percent of those buying entirely from stores.

Milk Consumption

There were 871 quarts of milk purchased during the seven-day period by 183 of the 198 families included in the survey (table 6). Six hundred and seventy quarts, or 77 percent of the total quantity consumed, was purchased from retail routes; 175 quarts, or 20 percent, from stores; and 26

Table 4 .-Relation of size of family to source of milk

Size of family	Fami- lies	Proportion of families in each group--					
		Having all milk delivered	Reporting delivery and store purchases	Buying entirely from stores	Buying entirely from country	Buying no milk	
<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	
White:							
One	2	100	-	-	-	-	
Two	24	71	8	17	4	-	
Three	41	64	10	24	-	2	
Four	38	89	3	5	-	1	
Five	25	80	-	16	4	-	
Six	12	50	17	33	-	-	
Seven or more	8	62	-	38	-	-	
Total: White		150	74	6	18	1	1
Negro:							
One	2	-	-	-	-	100	
Two	15	33	-	40	-	27	
Three	9	33	-	33	-	34	
Four	11	55	-	18	-	27	
Five	4	-	-	100	-	-	
Six	4	50	-	25	-	23	
Seven or more	3	-	-	100	-	-	
Total: Negro		48	33	-	40	-	27
All groups		198	63	5	23	1	8

Table 5.—Relation of source of milk purchases to number of blocks and estimated walking time between home and nearest store selling milk

Source of milk	Families	Average blocks away	Average minutes walk away	Proportion of families living—							
				Less than one block	One or two blocks	Three or four blocks	Five or more blocks	Less than one minute	One to three minutes	Four to eight minutes	Nine minutes or more
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Retail route only	126	2.3	4.6	13	48	35	4	3	37	47	13
Store only ^{1/}	61	1.0	1.8	55	38	7	-	16	72	10	2
Farm only	2	2.5	4.0	-	50	50	-	-	-	100	-
Route and store	9	2.0	3.8	-	78	22	-	-	45	44	11
All groups	198	1.9	3.7	25	46	26	3	7	47	36	10

^{1/}Fifteen families included who normally purchased milk at stores, but used no milk during week prior to the interview.

Table 6 .-- Total quantity of milk, milk products, and oleomargarine purchased by 198 families from various sources during one week period

Sources	Families	Milk	Cream	Butter- milk	Cottage cheese	Choco- late milk	Butter	Oleo
	<u>Number</u>	<u>(qts)</u>	<u>($\frac{1}{2}$ pts)</u>	<u>(qts)</u>	<u>(16 oz)</u>	<u>(qts)</u>	<u>(lbs)</u>	<u>(lbs)</u>
Retail route	135	670	98	137	168	56	50	-
Stores	61	175	7	116	11	9	97 ^{1/}	84
Farms	2	26	-	4	-	-	2	-
All groups	198	871	105	257	179	65	149	84

^{1/} Families buying milk from retail route purchased 69 pounds of butter from stores.

quarts, or three percent, was purchased from farms in the country. A total of 105 $\frac{1}{2}$ pints of cream was purchased, of which 98 were obtained from retail routes and only seven from the stores. Of the 257 quarts of buttermilk purchased, 137 were obtained from the milkman and 116 from stores. As in the case of cream, cottage cheese was purchased mainly from retail routes with 168 pounds being obtained from this source, and only 11 pounds from stores. Chocolate milk purchases were very similar, with 56 quarts coming from milk trucks and nine from stores. Butter was the only milk product of which a larger quantity was purchased from stores than from retail routes. Ninety-seven pounds were purchased from this source, as compared with only 50 pounds from retail routes.

Based on whole milk equivalent,^{1/} the daily per capita consumption of milk, cream, cottage cheese and butter for the 198 families was 1.4 pounds, or 1.3 pints, of 3.8 percent milk (table 7). As found in many studies,^{2/} Negroes accounted for the low-consuming group, with a daily per capita consumption of only 0.56 pints. The daily per capita consumption of the white families increased from slightly over one pint for the low income group to over one and one-half pints for the middle and one and four-fifths pints for the high income group. Per capita consumption of fluid milk, cream, and cottage cheese in the white groups increased with family income, in

^{1/}Whole milk equivalent was converted on the basis of 3.8 percent butterfat, and obtained by using the following conversion factors: $\frac{1}{2}$ pint 35 percent cream = 5.76 pounds milk, $\frac{1}{2}$ pint 20 percent cream = 3.29 pounds milk, one pound cottage cheese = 8.62 pounds milk, and one pound butter = 22.9 pounds milk.

^{2/}Bartlett, R. W., The Milk Industry, The Ronald Press Company, New York, 1946, pp. 218-219.

Table 7.—Relation of family income to total weekly consumption of milk, cream, buttermilk, cottage cheese, chocolate milk, butter, and daily per capita consumption expressed as whole milk equivalent

Family income	Total persons	Total weekly consumption of—							Daily per capita equivalent milk consumption: ^{1/}	
		Milk	Cream		Butter- milk	Cottage cheese	Chocolate milk	Butter	Milk	Milk
Group	Number	Qts.	$\frac{1}{2}$ Pt.	$\frac{1}{4}$ Pt.	Qts.	Lbs.	Qts.	Lbs.	Lbs.	Pts.
White:										
Low	217	234	3	2	83	38	25	38	1.1	1.02
Middle	220	342	8	35	78	51	25	53	1.7	1.58
High	156	200	8	45	34	70	14	42	2.0	1.86
Negro:										
All	170	95	-	4	62	20	1	16	0.6	0.56
All groups	763	871	19	86	257	179	65	149	1.4	1.30

^{1/}Conversion made on basis of 3.8% butterfat.

contrast to a decrease in buttermilk. There is no apparent relationship between the per capita consumption of chocolate milk and butter to family income. Negroes were low consumers of all milk products.

HOMEMAKERS' SENTIMENT TOWARD PRESENT TYPE DELIVERY SERVICE
AND ITS CONTINUANCE

As previously mentioned, there were 135, or 68 percent, of the families interviewed, who had all or some of their milk delivered during the seven-day period. Since these families are more vitally affected by the delivery service, and are obviously better qualified generally to report on them, most of the analysis and discussion is restricted to this group. A seven-day period was included, since it allowed sufficient time for purchases to be made by all families receiving retail delivery, and the period was not too long to overtax the homemaker's memory in reporting accurate information.

Description of Service Offered by Dealers

Frequency of Delivery

At the time of the survey there were three distinct systems of milk delivery. Homemakers could have their milk delivered three times a week, every-other-day, or four times a week. Three families were receiving six deliveries a week by patronizing two dealers.

Slightly less than two-fifths of the families receiving home delivery had their milk delivered every-other-day (table 8). Almost one-third received their milk three days a week, and a slightly less proportion four times a week.

The white families in the high income group showed the most pronounced preference for alternate-day delivery service. Sixty-six percent received their milk every-other-day, with 18 percent three days, and only 13

Table 8 .-- Number of times families had milk delivered during one week period

Frequency of delivery in seven-day period	Families	Proportion of total
	<u>Number</u>	<u>Percent</u>
Every-other-day	52	38
Three-days per week	43	32 ^{1/}
Four-days per week	40	30 ^{2/}
Total	135	100

1/ Two families purchased milk from two dealers, but the greater quantity was from dealer making three deliveries per week.

2/ One family purchased milk from two dealers, but the greater quantity was from dealer making four deliveries per week.

percent four days a week. One homemaker patronized two dealers, because she wanted fresh milk daily.

The middle income group also showed a preference toward every-other-day delivery, but to a lesser extent. Thirty-eight percent received three and one-half deliveries a week, compared with 34 percent three days and 28 percent four days per week. The low income group showed a slight preference toward four deliveries a week, with 43 percent receiving this type of service. Thirty-three percent received three deliveries per week, and only 18 percent every-other-day delivery. Two families reported buying milk from two dealers, because one wanted fresh milk daily and the other had no refrigeration for storage. Negro families were about equally divided between three and four deliveries per week, with only one family receiving milk every-other-day.

There is a close correlation between income and four deliveries per week. Forty-three percent of the white families in the low income group received four deliveries a week, compared to 28 percent of the middle, and 13 percent of the high income group (table 9). Forty-four percent of the Negro families received four deliveries a week. This is significant, since three dealers delivered milk four days a week to families requesting such service.

Every-other-day deliveries were made once in 48 hours, requiring alternately four deliveries one week and three the next. Three deliveries a week were made on Tuesday, Thursday, and Saturday to 82 percent of the families receiving this type of service, and 16 percent on Monday, Wednesday, and Friday (table 10). Four days a week deliveries were about equally divided between Monday, Tuesday, Thursday, and Saturday and Monday,

Table 9 .- Relation of family income to frequency of milk delivery

Family income	Families	Proportion of families receiving specified number of deliveries in one week--			
		Three	Every-other-day	Four	More than four
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:					
Low	33	33	18	43	6
Middle	47	34	38	28	-
High	39	18	66	13	3
Negro:					
All	16	50	6	44	-
All groups	135	31	38	29	2

Table 10.- Relation of frequency of delivery in one week to days of the week deliveries were made

Frequency of delivery in seven-day period	Families	Proportion of families receiving milk on specified days:						
		Mon. Wed. Fri.	Mon. Tue. Thur. Sat.	Mon. Wed. Fri. Sat.	Tue. Thur. Sat.	Tue. Thur. Fri. Sat.	Every other day	Other days
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Every-other-day	52	-	-	-	2	-	96	2
Three days per week	43	16	-	-	82	-	-	2
Four days per week	40	-	48	45	3	2	-	2
All groups	135	5	14	13	28	1	37	2

Wednesday, Friday, and Saturday.

Products Delivered

All milk dealers were processing and selling regular Grade A pasteurized milk, golden guernsey, and vitamin D homogenized milk. Milk products sold off the milk truck included whipping cream, coffee cream, buttermilk, chocolate milk, cottage cheese, and butter. This survey revealed the extent to which the homemakers were using the products and services offered by the milk dealers. Regular milk was the only grade purchased by three out of every four families (table 11). Almost one-third of the families purchased guernsey or vitamin D milk, whereas only six percent used both regular and special milk. As to be expected, white families in the high income group, showed a much greater demand for delivery of special grades of milk. Over one-half of the families in this group used a special grade of milk. Eighty-two percent of the families in the Negro and low white income groups, and 71 percent in the middle income group used only regular milk.

On the basis of the number of families using the product, the second most important was buttermilk (table 12). Over one-half of the families used this product. One-third of the families used butter, and about one-fourth used cream.

The white families in the middle and low income groups were the most frequent users of buttermilk and chocolate milk, while the high income families showed the greatest demand for cream and butter. Negro families used little or no cream, cottage cheese, or chocolate milk. The largest proportion of the families, 38 percent, used buttermilk with the next most

Table 11.--Relation of family income to grade or type of milk purchased from retail route

Family Income	Families	Proportion of families having specified grade or type of milk delivered:			
		Regular	Guernsey	Vitamin D	Regular & Guernsey or Vitamin D
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:					
Low	33	85	3	15	3
Middle	47	77	9	15	6
High	39	56	28	28	8
Negro:					
All	16	88	12	6	6
All groups	135	74	13	18	6

Table 12 .--Relation of family income to milk products delivered in addition to milk

Family Income	Families	Proportion of families having other products delivered in addition to milk:				
		Cream	Butter-milk	Cottage cheese	Butter	Chocolate milk
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:						
Low	33	6	55	21	30	12
Middle	47	30	68	30	26	19
High	39	41	38	23	44	10
Negro:						
All	16	6	38	-	31	-
All groups	135	24	53	22	33	13

important product, 31 percent, using butter.

Time of Delivery

Practically every homemaker desires a regular delivery at about the same hour. Only a few demand a prompt delivery at a definite time. This small group causes the dealers considerable inconvenience, and in many cases, additional expenditures of labor and equipment. Of course, there are some cases where the homemaker needs milk for a member of the family before he goes to school or work, and some where delivery is not desired until after a certain time. Therefore, it was felt that the satisfaction of homemakers with their route man might depend, at least to some extent, on the time their milk was delivered.

Over one-fourth of the 135 families buying from the milk truck received their milk between eight and nine o'clock during the summer (table 13). Twenty-one percent received their milk between 11 and 12, while about the same proportion, 14 percent, received their milk between 9 to 10, 10 to 11, and 12 to 1. Only seven percent received their milk between 7 and 8, and two percent after 1 o'clock in the afternoon.

It is significant to note that 69 percent of the white families in the high income group received their milk between 10 a.m. and 1 p.m., compared with 53 percent of the middle income, and only 15 percent of the low income group. Seventy percent of the white families in the low income group, received their milk before 9 o'clock, compared to 26 percent of the middle, and only 16 percent of the high income group.

About 90 percent of the 135 families interviewed reported delivery of their milk at approximately the same time in summer as in October,

Table 13 .--Relation of family income to time of milk delivery in Summer, 1947

		Proportion of families in each group whose milk was delivered from -							
Family Income	Families	7:00	8:00	9:00	10:00	11:00	12:00	1:00	No delivery
		to 7:59 a.m.	to 8:59 a.m.	to 9:59 a.m.	to 10:59 a.m.	to 11:59 a.m.	to 12:59 p.m.	to 1:59 p.m.	
<u>Group</u>	<u>Number</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>
White:									
Low	33	9	61	9	6	3	6	-	6
Middle	47	9	17	17	21	19	13	4	-
High	39	8	8	13	21	25	23	2	-
Negro:									
All	16	-	31	19	-	50	-	-	-
All groups	135	7	27	14	15	21	13	2	1

the time of the interview (table 14). Only two families were not route customers during the summer. There is little variation in the time of delivery from one season to the other, which apparently is desirable to practically all homemakers.

Reasons for Selecting and Patronizing a Particular Milkman

Selection of Milkman

The reasons why homemakers select a particular milk dealer are significant, since here is revealed the emphasis they place on different services. This information is desired by all aggressive, up-to-date milk dealers to be used as a guide in their future operations. However, one should act with some caution in arriving at conclusions from such statements, since certain factors, such as quality of milk, may be taken for granted. The psychology of advertising may be more readily capitalized on if the factors considered by homemakers in choosing a particular dealer are known.

Of the many reasons given for selecting a milkman, about one of every three homemakers selected their dealer on the basis of a recommendation by a friend (table 15). The quality of milk or service was the basis for selection for 15 percent of the homemakers; the first milkman to ask for the business, 14 percent; and friend or relative of the route man or dealer and business reciprocity, nine percent each. Four percent of the families selected their dealer because they gave baby formula service, five percent gave other reasons, and 14 percent could think of no reason for choosing their milk dealer.

A breakdown by income groups revealed that the white families of the

Table 14 .-- Relation of time of milk delivery in summer to time of milk delivery in October, 1947

Time of delivery in summer	Families	Proportion of families in each group whose milk was delivered in October:							
		7:00 to 7:59 a.m.	8:00 to 8:59 a.m.	9:00 to 9:59 a.m.	10:00 to 10:59 a.m.	11:00 to 11:59 a.m.	12:00 to 12:59 p.m.	1:00 to 1:59 p.m.	Indefinite
		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
A. M.									
7:00 to 7:59	10	100	-	-	-	-	-	-	-
8:00 to 8:59	36	3	97	-	-	-	-	-	-
9:00 to 9:59	19	-	5	90	-	-	-	-	5
10:00 to 10:59	20	-	5	5	90	-	-	-	-
11:00 to 11:59	28	4	4	-	4	85	-	-	3
P. M.									
12:00 to 12:59	17	6	12	-	-	-	82	-	-
1:00 to 1:59	3	-	-	-	33	-	-	67	-
No delivery	2	-	-	-	50	50	-	-	-
All groups	135	10	30	13	16	19	10	1	1

Table 15 .--Relation of family income to reasons for selecting milk dealer

Family Income	Families	Reci- procity	Proportion of families who reported reasons as follows:						
			Friends or rela- tive of milkman or dealer	Recomm- ended by a friend	Quality of milk or service considered superior	First milkman to ask for business	Prepared baby for- mula and gave such good service	Other reasons	No reason given
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:									
Low	33	9	22	21	15	6	9	6	12
Middle	47	11	8	34	19	13	-	4	11
High	39	10	3	36	10	20	8	5	8
Negro:									
All	16	-	-	19	12	19	-	6	44
All groups	135	9	9	30	15	14	4	5	14

middle income group placed more emphasis on quality of milk or service. The low income group was second followed by the Negro group. The high income group placed the least emphasis on this factor. The least emphasis placed on recommendation by a friend was by the Negro and low-income white groups with about one-fifth of these families choosing their milk dealer on this basis. Over one-third of the white families in the middle and high income groups reported this factor. Worthy of noting is the correlation between income and the factor of the first milkman to ask for the homemakers' business. Twenty percent of the white families in the high income group chose their milk dealer because he was the first to ask for the business. Only 13 percent of the middle, and six percent of the low-income white families reported this reason. One must conclude that apparently little effort is made by the dairies to include low income families among their customers.

Length of Time Patronizing Present Dealer

Nineteen percent of the homemakers receiving retail delivery had patronized their present milk dealer one year or less, while 34 percent had received milk from the same dealer for 10 years or longer (table 16). Only one, or six percent, of the Negro families had been receiving milk from the present dealer for one year or less, as compared with 11, or 34 percent, of the white families in the low income group. Only five, or 11 percent, of the families in the middle income group had patronized their present dealer for one year or less, compared to nine, or 23 percent, of the high income families. The white families in the middle income group were the most stable milk customers, based on the length of time patronizing

Table 16.—Relation of family income to length of time families had patronized their present milk dealer

Family Income	Families	Proportion of families who had patronized their present dealers for -				
		1 year or less	1.1 to 3.9 years	4 to 9.9 years	10 to 25.9 years	26 years or more
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:						
Low	33	34	6	21	27	12
Middle	47	11	15	40	34	-
High	39	23	18	28	26	5
Negro:						
All	16	6	25	38	19	12
All groups	135	19	15	32	28	6

their present dealer, with three out of every four buying milk for four years or longer.

Satisfaction with Services of Milkman

The milkmen were doing a splendid job of delivering milk, as evidenced by the fact that four of every five homemakers expressed complete satisfaction with the service they were rendering (table 17). Negro families expressed the least dissatisfaction. The number of white families reporting dissatisfaction increased as the family income increased, but to a slightly lesser extent.

One-third of the homemakers expressing dissatisfaction did so because of time of delivery (table 18). Frequency of delivery was found to be the next most important reason, while inability to plan quantity of milk needed and hoods for all grades of milk followed in this order of importance. Families in the low and middle income groups were dissatisfied mainly because of frequency of delivery, whereas those in the high income group reported their reason as time of delivery. This is probably due to an inadequacy of refrigeration space in low income families resulting from a larger number of persons per family.

There seemed to be some correlation between dissatisfaction and time of milk delivery (table 19). A possible relationship is indicated for those families receiving afternoon delivery, but the small number obtaining this service after one o'clock is insufficient to justify a sound conclusion. The least dissatisfaction was reported by those homemakers receiving delivery during the hour just prior to lunch. Since a higher percentage of the families in the high income group reported dissatisfaction

Table 17.--Attitude of families of different income groups toward service offered by their milk dealer

<u>Family income</u>	<u>Families</u>	<u>Proportion of families who expressed -</u>	
		<u>Satisfaction</u>	<u>Dissatisfaction</u>
<u>White:</u>			
Low	33	88	12
Middle	47	75	26
High	39	69	31
<u>Negro:</u>			
All	16	94	6
<u>All group</u>	<u>135</u>	<u>79</u>	<u>21</u>

Table 18.--Relation of family income to reasons for being dissatisfied with service offered by milk dealer

Family income	Families expressing dissatisfaction	Proportion of families giving specified reasons for being dissatisfied:				
		Frequency of delivery	Time of delivery	Inability to plan quantity needed	Other	
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:						
Low	4	25	25	-	-	50
Middle	12	50	25	8	8	9
High	12	8	50	8	8	9
Negro:						
All	1	-	-	-	100	-
All groups	29	28	34	7	10	21

Table 19.--Relation of time of milk delivery in Summer, 1947 to attitude of consumers toward service offered by their milk dealer

Time of Summer delivery	Families	Proportion of families who expressed -	
		Satisfaction	Dissatisfaction
<u>Hour</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
A.M.			
7:00 to 7:59	10	80	20
8:00 to 8:59	36	83	17
9:00 to 9:59	19	74	26
10:00 to 10:59	20	70	30
11:00 to 11:59	28	89	11
P.M.			
12:00 to 12:59	17	71	29
1:00 to 1:59	3	67	33
No delivery	2	50	50
All groups	135	79	21

because of time of delivery, this is not surprising. Most of the homemakers are at home during this hour, and it is most convenient for them to receive their milk at this time.

Slightly less than two-fifths of the homemakers considered the quality of milk or service of their present dealer superior (table 20). White families in the middle income group, and Negro families expressed the strongest preferences toward their present dealer's brand of milk and service. Less than one-fourth of the low income families thought the quality of milk or service was superior.

The length of time homemakers had patronized the milk dealer seemed to influence their attitude toward the quality of milk or service rendered except for those families patronizing a dealer for over 12 years (table 21). The longer the homemakers had patronized their present dealer, the more inclined they were to think the milk or service was superior. Homemakers showing the most loyalty to their milk dealer were those using his milk from four to 12 years.

Homemakers receiving milk every-other-day were in the majority in reporting they were receiving the best milk and service available (table 22). The smallest percentage of families believing they were patronizing the dealer with the best milk or service to be had, were receiving four deliveries per week.

When the homemaker considered the quality of milk or service superior, they were asked to state why. Over one-third reported the milk was either richer (more cream) or it tasted better than other brands (table 23). Fourteen homemakers said their deliveryman was dependable and courteous, and they rated him superior for these reasons. Other miscellaneous reasons,

Table 20.---Relation of family income to attitude of homemakers as to superiority of milk or service offered by their present dealer

Family Income	Families	Proportion of families who expressed the opinion that quality of milk or service offered by present dealer was -		
		Superior	Not Superior	Uncertain or no opinion
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:				
Low	33	24	73	3
Middle	47	47	51	2
High	39	36	56	8
Negro:				
All	16	44	56	-
All groups	135	38	58	4

Table 21.--Relation of length of time patronizing present milk dealer to homemakers' opinion toward quality of milk or service offered by present milk dealer

Length of time family had patronized present milk dealer	Families	Proportion of families who expressed the opinion that quality of milk or service offered by present dealer was -		
		Superior	Not Superior	Indefinite
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
1 year or less	26	31	69	-
2 to 3 years	20	35	60	5
4 to 12 years	58	45	50	5
Over 12 years	31	32	65	3
All groups	135	38	58	4

Table 22 .--Relation of frequency of delivery to attitude of homemakers as to superiority of milk or service offered by their present dealer

Frequency of delivery in seven-day period	Families	Proportion of families who considered quality of milk or service from present dealer -		
		Superior	Not superior	Uncertain or no opinion
<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Three	43	37	63	-
Every-other-day	52	44	48	7
Four	40	30	68	2
All groups	135	38	58	4

Table 23 .-- Relation of family income to reasons given for milk or service offered by present dealer being superior

Family income	Families	Proportion of families reporting reasons for quality of milk or service being superior were as follows--					
		Nice delivery man	Better quality milk	Early delivery	Every-other day delivery	Other	No reasons given
Group	Number	Percent	Percent	Percent	Percent	Percent	Percent
White:							
Low	8	38	13	13	12	12	12
Middle	22	31	31	9	9	14	6
High	14	7	50	36	7	-	-
Negro:							
All	7	43	43	-	-	14	-
All groups	51	28	35	16	8	9	4

apparently of little significance, were reported by all groups. There were little or no relationship between income and reasons reported.

Opinions Concerning Different Brands of Milk

Of the 135 homemakers receiving milk from retail routes, 87 reported they had tried other brands of milk during the past year (table 24). When asked if they liked these brands as well as their regular brand, 72 percent thought they were equally as good, while only 28 percent believed they were inferior. This fact is peculiarly significant, and might be used as a guide for instituting additional economies in a milk delivery system.

On the basis of income, only 15 percent of the white families in the low income group reported not liking other brands as well.

Experience with Economy Measures in Milk Delivery

Economy Measures and Their Effects

It is apparent to even the most casual observer that a saving in both labor and equipment has resulted from less than every-day delivery of milk. Additional savings have also resulted from the ban on special deliveries and call-backs for collecting bills, and others. Dr. Spencer estimates that a return to the prewar type of delivery service would increase the cost of delivering milk to retail customers by 1.3 cents per quart.^{1/}

^{1/}Spencer, Leland, Wartime Economics in Milk Delivery, Cornell University, Bul. A.E. 528-A, Sept., 1945, p. 3.

Table 24.--Relation of family income to attitude of homemakers toward other brands of milk

Family Income	Families	Proportion of families who reported 1/				
		Liking other brands as well	Not liking other brands as well	Reasons for not liking other brands:		
				Poor taste	Less cream	No reason given 2/
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:						
Low	20	85	15	5	5	5
Middle	30	70	30	17	10	3
High	26	69	31	15	12	4
Negro:						
All	11	64	36	18	9	9
All groups	87	72	28	14	9	4

1/ Forty-eight families had not tried any other brands of milk in the past year.

2/ One homemaker reported she was prejudiced.

Dr. Bressler estimates the additional cost would be 1.32 cents.^{1/}

Attitude Toward Less than Every-day Delivery

Homemakers in Roanoke had been receiving less than every-day delivery of milk for over four years. For this reason, it was thought they could give a valid answer as to whether it imposed a hardship upon them or not. Only 16 percent reported it was a hardship indicating that the new system had been willingly received (table 25).

As would be expected, the white families in the low income group experienced the greatest hardship, while those in the high income group experienced the least. Only one Negro homemaker reported less frequent delivery a hardship.

When grouped according to frequency of deliveries, less than one homemaker out of every 10 receiving every-other-day delivery reported a hardship (table 26). Twenty percent of the families receiving four deliveries a week, and 23 percent three deliveries, said less than every-day delivery constituted a hardship.

One-fifth of the 135 families receiving doorstep delivery had ice refrigeration (table 27). Only one family had no refrigeration facilities.

Families with ice refrigeration purchased an average of 1.2 quarts of milk each delivery, while those with mechanical refrigeration purchased 2.4 quarts. The amount of milk purchased each delivery seems to be a factor responsible for less than every-day delivery imposing a hardship, rather than the type of refrigeration. Families using the largest

^{1/}Bressler, R. G., Efficiency of Milk Marketing in Connecticut, 5. Economics and Biology of Alternate-Day Milk Delivery, Conn. (Storrs) Agri. Exp. Sta. Bul. 247, May, 1943, p. 34.

Table 25.—Relation of family income to attitude of homemakers toward less than every-day milk delivery

Family Income	Families	Proportion of families whose expressed opinions concerning less than every-day delivery were as follows:	
		Constitutes a hardship	Is not a hardship
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
White:			
Low	33	24	76
Middle	47	17	83
High	39	13	87
Negro:			
All	16	6	94
All groups	135	16	84

Table 26.—Relation of frequency of delivery to attitude of homemakers toward less than every-day delivery of milk

Frequency of delivery in seven-day period	Families	Proportion of families whose expressed opinions concerning less than every-day delivery were as follows	
		Constitutes a hardship	Is not a hardship
<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
Three	43	23	77
Every-other-day	52	8	92
Four	40	20	80
All groups	135	16	84

Table 27.—Relation of refrigeration facilities to average quantity of milk purchased each delivery and attitude of consumers toward less than every-day delivery of milk

Refrigeration facilities in the home	Families	Average amount of milk purchased each delivery	Proportion of families whose expressed opinions concerning less than every-day delivery were:	
			Constitutes a hardship	Is not a hardship
	<u>Number</u>	<u>Quarts</u>	<u>Percent</u>	<u>Percent</u>
None	1	0.7	100	-
Ice	20	1.2	10	90
Mechanical	114	2.4	17	83
All groups	135	2.2	16	84

quantities of milk were the most frequent in reporting hardships.

Each homemaker was asked, "How many quarts of milk can you store conveniently in your refrigerator at one time?" and "Is this sufficient for alternate-day delivery?" Ninety-six percent of the families reported their refrigeration facilities to be adequate (table 28). However, 17 homemakers, or 13 percent, reported less than every-day delivery being a hardship. Of the five families reporting storage space insufficient for alternate-day delivery, one homemaker said this system of delivery was not a hardship, because she could conveniently supplement her regular supply by store purchases.

There was no relation between the size of family and the number of homemakers finding less than every-day delivery a hardship (table 29). The average size family, three or four, reported the most hardships.

Seven of the nine families regularly supplementing their retail route supply with store purchases reported less frequent delivery service imposed a hardship upon them, in contrast to only 12 of the 126 families buying from retail route only (table 30).

Adjustment to Less than Every-day Delivery

Only 22 of the 135 homemakers had not adjusted themselves to the new delivery system. Running short of milk was the most frequent reason reported for less than every-day delivery being a hardship (table 31). This reveals a lack of ability on the part of these homemakers to adequately plan their needs, since they have had over four years experience with the new system. However, a little effort given to proper planning would probably eliminate this weakness. Four homemakers wanted milk fresh daily.

Table 28.—Relation of adequacy of refrigeration to attitude of families toward less than every-day delivery of milk

Families finding storage space in refrigerator	Families	Proportion of families whose expressed opinion concerning less than every-day delivery were:	
		Constitutes a hardship	Is not a Hardship
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
Sufficient	129	13	87
Insufficient	5	80	20
No reply	1	100	-
All groups	135	16	84

Table 29 .--Relation of size of family to attitude of homemakers toward less than every-day delivery of milk

Persons in family	Families	Proportion of homemakers whose expressed opinions concerning less than every-day delivery were:	
		Constitutes a hardship	Is not a hardship
<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
One	2	-	100
Two	24	12	88
Three or four	74	22	78
Five or six	30	10	90
Seven or more	5	-	100
All groups	135	16	84

Table 30.—Relation of source of milk to attitude of homemakers toward less than every-day delivery of milk

Source of milk	Families	Proportion of families whose expressed opinions concerning less than every-day delivery were:	
		Constitutes a hardship	Is not a hardship
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
Retail route only	126	12	88
Retail route & store	9	78	22
All groups	135	16	84

Table 31.--Relation of family income to reasons reported by homemakers for less than every-day delivery of milk being a hardship

		Proportion of families reporting specified reasons for less than every-day delivery of milk being a hardship:					
Family Income	Families	Running short of milk	Milk not fresh daily	Refrigeration inadequate	More milk used	Other	No reason given
<u>Group</u>	<u>Number</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>
White:							
Low	8	38	38	12	-	12	-
Middle	8	63	-	-	12	12	13
High	5	20	20	60	-	-	-
Negro:							
All	1	100	-	-	-	-	-
All groups	22	45	18	18	5	9	5

This type of hardship can be eliminated only by store purchases or a change in the consumers' habits. Of the four families reporting a hardship because of inadequate refrigeration, two were expecting a larger refrigerator as soon as their order could be filled.

Most of these hardships could easily be eliminated through a little effort on the part of the homemakers concerned.

Attitude Toward Continuance of Present Economy Measures

Less than Every-day Delivery Service

In answer to the question "Are you willing to continue receiving less than every-day delivery?", 92 percent of the homemakers reported in the affirmative. One percent were indefinite (table 32). The white families in the low income group were among the largest proportion unwilling to continue the system, with 15 percent of them answering in the negative.

It was explained to each homemaker that a change back to every-day delivery would necessitate an increase in labor and equipment, and consequently an increase in cost for delivering the same amount of milk. She was further told about studies made on cost of milk delivery, and that this additional service would probably mean about one cent per quart increase in cost to the milk dealers. This additional cost would finally have to be paid by the consumer.

Following this explanation, each homemaker was asked "Are you willing to pay one cent per quart more to receive every-day delivery?" While only 10 of the families, or seven percent, said they were not willing to continue the present delivery system, 16, or 12 percent, reported they were willing to pay one cent more to receive every-day-delivery

Table 32.--Relation of family income to attitude of homemakers toward continuing less than every-day delivery of milk

Family Income	Families	Proportion of families who were -			Willing to pay- One cent more for every-day delivery
		Willing to continue less than every-day delivery	Not willing to continue less than every-day delivery	Indefinite	
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:					
Low	33	82	15	3	24
Middle	47	96	4	-	11
High	39	92	8	-	8
Negro:					
All	16	100	-	-	-
All groups	135	92	7	1	12

service. No families reported a willingness to pay more than one cent.

There was a negative correlation between income and a willingness to pay this extra cost to receive every-day delivery. Those more willing were the families in the low income group, while those least willing to pay for this additional service were in the high income group. However, the same proportion of families in the low income group reported less than every-day delivery being a hardship. But less than the number of families in the middle and high income groups reporting a hardship, were willing to pay any more to receive every-day delivery service.

It may be concluded that less than every-day delivery is desired by practically all of the homemakers in Roanoke, and this type service should be continued as long as this situation prevails. In fact, all dealers should give serious consideration to making retail deliveries strictly on every-other-day basis.

Special Deliveries and Call-backs

No special deliveries had been received by any of the 135 homemakers during the month's period prior to the interview. Furthermore, no one suggested this service be resumed. The same thing was true on call-backs for collecting bills. All bills were being collected by the route man while making regular deliveries.

Quart Size Container

Only the quart size container had been used in the retail trade in Roanoke since 1942. Every homemaker receiving doorstep delivery reported she preferred this size container for milk.

The Square Bottle

The square milk bottle saves space. Daley reports up to 50 percent saving in home and store refrigerators, and a substantial amount in trucks. A case of the new-type bottles weighs up to 15 percent less than a case of round bottles.^{1/} Dealers using the square bottle in Roanoke claim eight square bottles will fit in the same space of five round bottles.

About 65 percent of the families receiving doorstep delivery were receiving their milk in square bottles. Every homemaker receiving milk in square bottles expressed a preference for this type container. In practically every case the preference was because the square bottle took up less space in the refrigerator.

Because of the strong preference expressed by these homemakers using the square bottle, dealers not furnishing this type container should give this change serious consideration.

Demand for Improved Services

As mentioned previously, 79 percent of the homemakers said they were entirely satisfied with the service their milkman was giving them. Many revealed to the interviewer that they would change to another dealer, if he offered better service than that being received by their present one.

Ten homemakers, or seven percent of the 135 families, expressed dissatisfaction, because they preferred their milk to be delivered either earlier or later.

^{1/}Daley, J. L., Experiences with Square Milk Bottles, The Dairy World, Vol. 23, No. 8, January, 1945, pp. 8-12 and 52-53.

When asked the latest time of delivery that would be acceptable, 84 percent of the homemakers reported they would be willing to accept later deliveries than the present time of delivery (table 33).

Ninety-three percent reported they would be willing to accept earlier deliveries than the present time of delivery (table 34). These data reveal that much additional leeway is possible for the milkman rather than much dissatisfaction with the present time of delivery.

At the end of the interview, homemakers were invited to make suggestions for improving the present system. Ten homemakers proposed that hoods be put on regular milk, rather than limiting it to special grades only. Three families expressed a preference for paper cartons, while two homemakers thought milk boxes should be furnished customers by the dealers.

Milk Purchases from Stores

Since milk sold for one and two cents more to consumers at stores than from the milk truck, it was felt that those who purchased from this source did so for reasons other than price. These reasons should bring into sharper focus some inefficiencies now prevailing in the milk delivery system.

Of the 198 families included in the study, 55 purchased milk at stores during the seven-day period prior to the survey. Forty-six of these purchased all of their milk from this source, while nine received doorstep delivery and supplemented this with store purchases. An additional 15 families purchased all milk at stores, but did not make any purchases during the seven-day period.

Over one-half of the 61 families, who obtained their entire supply

Table 33.--Relation of time of delivery in summer, 1947 to latest time of delivery that would be satisfactory

		Proportion of families reporting the latest time of summer delivery that would be acceptable:								
Time of delivery	Families	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2 p.m. or later	Any time
		to 7:59 a.m.	to 8:59 a.m.	to 9:59 a.m.	to 10:59 a.m.	to 11:59 a.m.	to 12:59 p.m.	to 1:59 p.m.		
<u>Hour</u>	<u>Number</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>
A.M.										
7:00 to 7:59	10	-	10	20	10	30	20	-	10	9
8:00 to 8:59	36	-	-	11	11	36	3	3	8	28
9:00 to 9:59	19	-	-	-	5	52	21	-	11	11
10:00 to 10:59	20	-	-	-	5	35	20	-	20	20
11:00 to 11:59	28	-	-	-	-	39	22	7	18	14
P.M.										
12:00 to 12:59	17	-	-	-	6	12	29	12	23	18
1:00 to 1:59	3	-	-	33	-	-	-	-	33	34
Not reported	2	50	-	-	-	-	-	-	-	50
All groups	135	1	1	5	6	34	16	4	15	18

Table 34.--Relation of time of delivery in Summer, 1947 to earliest time of delivery that would be satisfactory

Time of summer delivery	Families	Proportion of families reporting earliest time of summery delivery that would be acceptable:					
		Before 7 a.m.	7:00 to 7:59 a.m.	8:00 to 8:59 a.m.	9:00 to 9:59 a.m.	10:00 to 10:59 a.m.	Any time
<u>Hour</u>	<u>Number</u>	<u>1/2</u>	<u>1/2</u>	<u>1/2</u>	<u>1/2</u>	<u>1/2</u>	<u>1/2</u>
A.M.							
7:00 to 7:59	10	50	40	-	-	-	10
8:00 to 8:59	36	53	33	11	-	-	3
9:00 to 9:59	19	47	32	11	5	-	5
10:00 to 10:59	20	35	40	10	5	5	5
11:00 to 11:59	28	46	32	11	-	-	11
P.M.							
12:00 to 12:59	17	35	41	18	-	-	6
1:00 to 1:59	3	33	67	-	-	-	-
No delivery	2	50	-	-	-	-	50
All groups	135	45	36	10	1	1	7

of milk from stores, had been patronizing this source for five years or longer (table 35). This reveals that these families were store customers before less than every-day delivery was instituted in 1943. Almost one-fifth had been buying milk at stores for less than one year.

The Negro families had patronized the stores longer than any of the white family groups. Sixty-three percent of the white families of the middle income group had purchased milk for five years or longer as compared with only 36 percent of the low income group.

Families with one or two and five or six persons had patronized stores longer than medium (3 or 4) and large (7 or more) families (table 36).

The most important reason for buying milk at stores was because of its convenience. Over one-half of the families obtaining all or a part of their supply from stores reported this reason (table 37). This is a very logical reason, when one considers the fact that the average number of blocks to the nearest store selling milk was only one, or an estimated walking time of 1.8 minutes (table 5). Using insufficient quantities to justify stopping the milkman was reported as the next most important reason. This seems logical also, since one should not expect the milkman to stop three or four times a week, only to discover no milk is desired. Six percent of the homemakers reported they purchased milk at stores because they could get the exact quantity wanted when needed, while another six percent said they were not home when the milk truck came by. Eight percent could give no reason for patronizing the store.

As mentioned earlier, nine homemakers received their main milk supply from milk trucks and were also regular store customers. Their main reason for buying at stores was to supplement milkman's supply.

Table 35.--Relation of family income to length of time homemakers had purchased milk at stores

Family Income	Families	Proportion of families receiving all milk from stores for -		
		Less than 1 year	1 to 4 years	5 years and over
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:				
Low	25	28	36	36
Middle	8	25	12	63
High	2	50	-	50
Negro:				
All	26	4	27	69
All groups	61	18	28	54

Table 36.—Relation of size of family to length of time homemakers had purchased milk at stores

Size of family	Families	Proportion of families receiving all milk from stores for -		
		Less than 1 year	1 to 4 years	5 years or more
<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
1 or 2	16	19	19	62
3 or 4	25	20	28	52
5 or 6	14	14	29	57
7 or more	6	17	50	33
All groups	61	18	28	54

Table 37.--Reasons for buying milk at stores as reported by homemakers who purchased all or some milk from this source

Source of milk	Families	Proportion of families reporting reason for buying milk at store:					
		Get exact quantity needed	Convenience	Insufficient quantity used to stop truck	Not home when milk truck comes	Other reasons	Indefinite
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Store only	46	4	60	9	9	11	7
Farm only <u>1/</u>	2	-	50	-	-	-	50
No fresh milk purchased <u>2/</u>	15	13	40	40	-	-	7
All groups	63	6	56	16	6	8	8

1/ Reported that milk was purchased from stores to supplement farm purchases.

2/ Reported that milk was used occasionally and they purchased it from stores.

Sixty-eight percent of the 63 families buying milk solely at stores had no brand preference (table 38). The 20 homemakers preferring a particular brand reported the main factor considered in making a selection was the quality of milk (taste and cream line). Only three families reported their selection was based on the recommendation by a friend. Four reported other miscellaneous reasons, and three homemakers could give no reason.

Over one-half of the families purchased their milk at stores at no certain time (table 39). Slightly more than one-fourth purchased their milk between 9:00 a.m. and prior to 12 Noon. Sixteen percent made their purchases in the afternoon, while only one homemaker visited the store for milk before 9:00 a.m.

There was no significant relation between family income and time of making purchases. The majority of the Negro families had no certain time for making their milk purchases. This was probably due to the small quantities of milk used, necessitating only an occasional trip to be made for this purpose.

Forty-six percent of the 55 families buying milk at stores during the seven-day period made two or three purchases (table 40). Twenty-one percent made only one purchase while 18 percent made six or more. Of the 46 families buying all milk at stores, 23 percent made one purchase, 50 percent two or three, and 27 percent made four or more. Six of the nine families buying from retail route and store made only one purchase, two made two or three, and only one made four or more.

As to be expected, homemakers made most of the store purchases of milk (table 41). Children were the next most frequent buyers, while the

Table 38.—Relation of family income to reasons reported as basis for selecting brand of milk at stores

Reported family income	Families	Proportion of families who reported reasons as follows:				
		Recommended by friend	Quality of milk	Other	Indefinite	No brand preference
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:						
Low	20	5	25	5	-	65
Middle	9	-	22	11	-	67
High	2	50	-	-	-	50
Negro:						
All	32	-	13	6	9	72
All groups	63	3	18	6	5	68

Table 39.—Relation of family income to time of day milk was purchased from stores

Family income	Families	Proportion of families in each group whose milk was purchased—					
		Before 9 a.m.	9 a.m. to 11:59	12 Noon to 2:59	3 p.m. to 6 p.m.	No certain time	No answer
Group	Number	Percent	Percent	Percent	Percent	Percent	Percent
White:							
Low	20	-	35	10	15	40	-
Middle	9	-	11	22	11	45	11
High	2	-	50	-	-	50	-
Negro:							
All	32	3	25	3	3	62	3
All groups	63	2	27	8	8	52	3

Table 40.— Number times 55 families purchased milk from stores during seven-day period

Source of milk	Families	Proportion of families buying milk from stores during seven-day period—			
		One time	Two or three times	Four or five times	Six times or more
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Store only	46	23	50	7	20
Retail route and store	9	67	22	-	11
All groups	55	31	46	5	18

Table 41.-- Relation of member of family making purchase to necessity for special trip to purchase milk at stores

Member of family making the purchase	Families	Proportion of families reporting special trip was--	
		Necessary	Unnecessary
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
Homemaker	25	56	44
Husband	6	17	83
Child	17	41	59
No special one	11	64	36
All milk delivered by store	4	-	100
All groups	63	46	54

husband seldom purchased milk at the store. Four families had all of their milk delivered by the store.

Less than one-half of the store purchases required a special trip. Over one-half were made when groceries or other items were being purchased, or milk was delivered by the store along with other groceries.

What effect does an increase or decrease in proportion of store sales have upon the total per capita consumption of milk? Bartlett^{1/} reports "that an increase in the proportion of store sales to total sales tends to be accompanied by a greater increase in per capita sales than when the proportion of store sales in relation to total sales is decreasing." However, some members of the dairy industry still believe that milk sold through stores will tend to curtail consumption, because consumers do without the product during bad weather. Therefore, they have discouraged the selling of milk through stores. The extra price differential charged the store customers tends to indicate that the dealers in Roanoke and the State Milk Commission are also of this opinion.

However, in this study, 94 percent of the 63 store customers stated they did buy milk in bad weather, just the same as any other time (table 42).

Grouped according to the member of the family making the purchase, 17 percent of the husbands and 12 percent of the homemakers did not purchase milk during bad weather. In cases where the child or no special member of the family made the purchase, bad weather had no effect whatsoever on milk sales.

^{1/}Bartlett, R. W., The Milk Industry, The Ronald Press Company, New York, 1946, p. 173.

Table 42.—Relation of member of family making the purchase to store purchase of milk during bad weather

Member of family making the purchase	Families	Proportion of families who—	
		Purchased milk during bad weather	Did not purchase milk during bad weather
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
Homemaker	25	88	12
Husband	6	83	17
Child	17	100	-
No special one	11	100	-
All milk delivered by store	4	100	-
All groups	63	94	6

Store Deposit on Bottles

Every homemaker buying milk at stores reported paying a two cents deposit charge on bottles. Not one homemaker suggested that this charge be discontinued. Apparently they felt this was a desirable practice and did not object to its continuance.

HOMEMAKERS' SENTIMENT TOWARD PROPOSALS FOR UNIFIED DELIVERY SERVICE
AND EXCLUSIVE STORE SALES

Operation of Unified System

No one will deny that milk delivery under a unified system would reduce vehicle mileage and labor. Milk distribution is characterized by wasteful duplication of equipment and labor. Dr. Leland Spencer reports that "The suggestion most frequently made is that duplication in delivery service be eliminated or reduced to a minimum".^{1/} Professor Mortenson and others estimate that as much as two cents per quart or even more could be saved if milk distribution were made a public utility.^{2/} These estimates are based, of course, on the assumption that the same efficiency of personnel would exist as under private management and keen competition. In a study made of the major milk markets in Connecticut, Bressler^{3/} found that if all deliveries were made from one centrally located plant (Public Utility), route miles would be slightly greater than those for exclusive territories, because of the increased average length of haul.

While it is true that a unified system would reduce delivery costs, it is obvious that the loss of certain advantages, such as the consumers' freedom of choosing a particular milkman, must be forfeited. In this study,

^{1/}Anderson, Roice and Spencer, L., Ways of Conserving Tires and Reducing Other Expenses in Retail Milk Distribution, Farm Economics No. 129, Cornell University, February, 1942, p. 3242.

^{2/}Mortenson, W. P., Milk Distribution As A Public Utility, The University of Chicago Press, 1940, p. 82.

^{3/}Bressler, R. G., Clark, D. A., and Seaver, S. K., Conservation Possibilities in Retail Delivery in Major Markets, Connecticut (Storrs) Agri. Exp. Sta., Bul. 253, 1944, p. 39.

many homemakers expressed a fear that such a monopoly would result in lower quality milk, less efficient service, and possibly higher rather than lower prices.

Two methods of unified delivery were discussed during the interview. The first was a complete consolidated delivery plan, allocating a definite section of the city to each of the four milk dealers. It was suggested that this be done by an impartial board, appointed and supervised by the mayor of the city and the local milk board. The other plan was the operation of one central milk plant by the city on a monopoly basis.

Knowledge of Duplication in Delivery

Only four percent of the 198 homemakers included in the study were indefinite as to the number of milk trucks passing along the street (table 43). Two or more trucks were reported by the other 96 percent. Over one-half of the families reported four trucks delivering milk along the street, one-third three, and only 11 percent two. Area two (mostly middle-income white families) had the greatest amount of duplication, and area three (mostly high-income white families) had the least. Homemakers were conscious of excessive duplication. In fact, many of them thought something should be done to reduce it, since milk was such an essential food.

Willingness to Accept Unified Delivery

Choice of Milkman

In this study, it was found that 69 percent of the homemakers receiving retail delivery service would be willing to give up their favorite

Table 43.—Relation of sample areas to number of milk trucks making deliveries in the area

Area number*	Families	Proportion of families reporting—			
		Two	Three	Four	Indefinite
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
One	50	6	38	52	4
Two	50	6	16	76	2
Three	50	26	40	28	6
Four	48	6	40	52	2
All families	198	11	33	52	4

*See figure 1.

brand and routeman for less than one cent reduction in price per quart of milk (table 44). Another 16 percent indicated a willingness to accept a consolidated delivery plan if it would mean a saving to them of at least one cent. Since it is probable that such a change would reduce the cost of milk delivery approximately one cent, this means that about 85 percent of the homemakers were willing for this economy measure to be instituted. Nine percent of the families definitely opposed such a change, and six percent were indefinite. The white families in the high and middle income groups were least willing to give up their choice of a milk dealer, while the low-income white and Negro families were almost unanimous for the proposal if it meant as much as one cent per quart reduction in price.

There seems to be some variation between the large and small families and the amount of saving necessary to induce them to willingly accept a consolidated delivery plan. Only three-fourths of the families with two persons would change for one cent or less, while all families with seven or more favored the change (table 45).

As one would expect, there is some correlation between the length of time homemakers had patronized their present dealer and their attitude toward seeking a lower price by means of consolidated delivery. As the time of patronizing their present dealer increased from one year or less to 12 years, the amount of saving necessary to induce them to change increased (table 46). This was not true for the 31 families dealing over 12 years with their present dealer. One possible explanation for this is that the dealers had served these homemakers for so long a period, they were sure of their continued loyalty, and therefore less effort was being exerted to render the service they once did.

Table 44.—Relation of family income to attitude of homemakers toward giving up the opportunity of choosing favorite brand and route man to save through consolidated delivery

		Proportion of families who expressed attitude toward giving up favorite brand and route man for—				
Family income	Families	Less than one cent	One cent	Two cents	Three cents or more	Indefinite
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:						
Low	33	79	15	-	-	6
Middle	47	64	19	11	2	4
High	39	61	15	10	6	8
Negro:						
All	16	82	6	6	-	6
All groups	135	69	16	7	2	6

Table 45.—Relation of size of family to attitude of homemakers toward giving up the opportunity of choosing favorite brand and route man to save through consolidated delivery

Persons in family	Families	Proportion of families who expressed attitude toward giving up favorite brand and route man for—				
		Less than one cent	One cent	Two cents	Three cents or more	Indefinite
<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
One	2	50	50	-	-	-
Two	24	63	12	8	4	13
Three or four	74	75	11	7	3	4
Five or six	30	56	27	10	-	7
Seven or more	5	80	20	-	-	-
All groups	135	69	16	7	2	6

Table 46.- Relation of length of time patronizing present dealer to attitude of homemakers toward giving up the opportunity of choosing favorite brand and route man to save through consolidated delivery

Length of time family had patronized present dealer	Families	Proportion of families who expressed attitude toward giving up favorite brand and milk-man for-				
		Less than one cent	One cent	Two cents	Three cents or more	Indefinite
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
One year or less	26	88	12	-	-	-
Two to three years	20	60	10	5	5	20
Four to twelve years	58	67	17	12	2	2
Over twelve years	31	62	19	6	3	10
All groups	135	69	16	7	2	6

When including the 63 families who purchased no milk from retail routes, a little larger proportion of the total families were willing to give up their favorite brand or milkman for a saving of one cent or less. However, it is very doubtful that consolidated store delivery would mean as much as one cent reduction in delivery costs. Families purchasing no fresh milk during the seven-day period were most willing to accept consolidated delivery for less than one cent saving (table 47). Those buying from both milk trucks and stores were the strongest opposers. Approximately 80 percent of the store customers were willing to accept consolidated delivery for one cent saving, while 70 percent of the homemakers purchasing solely from retail routes would change. Only four percent of the 61 families buying all milk regularly or occasionally from stores would not favor consolidation of milk delivery to stores for one cent or less.

With such a large proportion of families indicating a willingness to accept consolidated delivery, this economy measure should be given serious consideration by the dealers and other interested parties. However, any method of making this system rational would require extensive public regulation because dealers would be reluctant to accept such a program on a voluntary basis.

The Proposal For a Municipal Plant

Attitude Toward Proposal

All of the 198 homemakers interviewed were asked two questions regarding their attitude toward a municipal milk distribution system in Roanoke. The first question, "Assuming that the present dealers were

Table 47.—Relation of source of milk to attitude of homemakers toward giving up the opportunity of choosing favorite brand and route man to save through consolidated delivery

Source of milk	Families	Proportion of families who expressed attitude toward giving up favorite brand and route man for—				
		Less than one cent	One cent	Two cents	Three cents or more	Indefinite
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Retail route only	126	70	14	7	3	6
Store only	46	81	15	4	-	-
Farm only	2 ^{1/}	50	-	50	-	-
Retail route and store	9	56	33	11	-	-
No milk bought	15	87	13	-	-	-
All groups	198	72	15	7	2	4

^{1/}Too few to include in the analysis.

bought out on a reasonable basis, would you favor a municipal milk distribution system for Roanoke?" and the second, "If a municipal plant were operated in competition with private dealers, which would you probably patronize?" Due to lack of time and other reasons, no publicity was given the survey, and none of the homemakers had been contacted before the day of the interview. Consequently, little or no thought had been given these questions by the respondents before hand. However, each homemaker was given several minutes during the interview to think of the advantages and disadvantages that may be realized, before being asked for a reply. In all cases where the husband or other adult members of the family were present, they were asked to discuss their opinions. In many instances the proposal was discussed for over ten minutes before a reply was given.

Slightly over one-half of the 198 families reported they would favor such a system (table 48). Almost one-third were definitely opposed to the change, and 16 percent were uncertain.

There seem to be no relation between income and homemakers' attitude toward the proposal. Only three of the Negro families definitely opposed the change. Fifty-two percent of the white families in the middle income group, and a somewhat smaller proportion of the low and high income groups would not favor a municipal milk distribution system.

There was a definite correlation between the source of milk and the proportion of families in favor of the change. Homemakers buying solely from retail routes were most reluctant to favor the system, while those buying no milk during the one-week period were most willing (table 49).

Table 48.--Relation of family income to attitude of homemakers toward a municipal milk distribution system

Family income	Families	Proportion of families who expressed attitude toward a municipal milk distribution system		
		Would favor	Definitely opposed	Uncertain
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:				
Low	53	47	28	25
Middle	56	36	52	12
High	41	44	37	19
Negro:				
All	48	88	6	6
All groups	198	53	31	16

Table 49.- Relation of source of milk to attitude of homemakers toward a municipal milk distribution system

Source of milk	Families	Proportion of families who expressed attitude toward a municipal milk distribution system:		
		Would favor	Definitely opposed	Uncertain
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Retail route only	126	45	38	17
Store only	46	65	22	13
Farm only	2 ^{1/}	50	50	-
Retail route and store	9	67	22	11
No milk bought	15	80	7	13
All groups	198	53	31	16

^{1/}Too few to include in the analysis.

Consumers buying milk entirely from stores or retail route and store reported about the same degree of willingness for the product to be distributed by the municipality.

There was considerable variation in the proportion of retail customers willing to accept consolidated delivery (table 44) from those favoring a municipal plant. As mentioned previously, 85 percent were willing to give up favorite brand and route man for consolidated delivery, in contrast to only 46 percent favoring a municipal distribution system. This indicates that the people desire the cost of delivering milk be reduced, but they want this service continued as a private enterprise.

Intentions of Patronizing a Municipal Milk Plant

Although no attempt was made to find out why homemakers objected to the municipality distributing all milk for the city, many of them voluntarily stated they feared such a monopoly would encourage inefficient and unsatisfactory service. The suggestion that a municipal plant be operated in competition with the present dealers eliminates this objection, and, therefore, measures more accurately the homemakers' true feeling towards their municipality participating in this service.

Only four percent of the 198 families included in the interview reported they would patronize a municipal plant, if such were operated in competition with their present dealer (table 50). Forty-two percent were uncertain as to what they would do. This is significant, since it indicates a strong feeling of loyalty and satisfaction with their present dealers. There is a close correlation between income and those who would continue buying from private dealers. Slightly less than one-half of the

Table 50.—Relation of family income to attitude of homemakers toward patronizing a municipal milk plant in competition with present dealers

Family income	Families	Proportion of families who said they probably would patronize:		
		Municipal plant	Private dealer	Uncertain
<u>Group</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:				
Low	53	6	49	45
Middle	56	4	73	23
High	41	2	83	15
Negro:				
All	48	4	13	83
All groups	198	4	54	42

white families in the low income group thought they would patronize a private dealer, while almost three-fourths of the middle income and over four-fifths of the high income families reported they would continue with their private dealer.

Two-thirds of the homemakers receiving all of their milk at the door-step reported they would continue patronizing their present dealer, if a municipal plant were operated in competition with private dealers (table 51). The other third, except for one homemaker who would patronize the municipal plant, were uncertain what they would do. Five, or 11 percent, of the families buying milk at stores during the one-week period said they would patronize a municipal plant, 33 percent private dealers, and 56 percent were uncertain which they would patronize. Of the nine families buying milk from retail route and store, four reported they would continue with their present dealers and five were not sure whom they would patronize. Two reported they would probably deal with the municipal plant, and two with private dealers.

When grouping the families according to their attitude toward a municipal milk distribution system, an interesting comparison is shown. While 105, or 53 percent, favored such a system, only four percent reported they would probably patronize a municipal plant, if operated in competition with the present dealers (table 52). It is also significant to note that 58 percent of the 31 homemakers, who were uncertain on the establishing of a municipal system, reported they would patronize a private dealer. Only two percent of the 62 homemakers opposing the establishment of a municipal plant indicated they would patronize such if operated along with the private dealers, while 98 percent would continue to buy from their present dealers.

Table 51.—Relation of family income to attitude of homemakers toward patronizing a municipal milk plant in competition with present dealers

Family income	Families	Proportion of families who said they probably would patronize:		
		Municipal plant	Private dealer	Uncertain
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Retail route only	126	1	67	32
Store only	46	11	33	56
Farm only	2	-	50	50
Retail route and store	9	-	44	56
No milk bought	15	13	13	74
All groups	198	4	54	42

Table 52.—Relation of homemakers' attitude toward proposal for a municipal milk distribution system to attitude of homemakers toward patronizing a municipal milk plant in competition with present dealers

Homemakers' attitude toward proposal for a municipal milk distribution system	Families	Proportion of families who reported they would probably patronize—		
		Municipal plant	Private dealer	Uncertain
	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Favored	105	8	27	65
Opposed	62	-	98	2
Uncertain	31	4	58	42
All groups	198	4	54	42

From these date, one must conclude that it would be very unwise to institute this economy measure with such a large proportion of families definitely opposed.

Attitude Toward Exclusive Store Sales

There has been much interest expressed concerning the sale of milk through stores, in order to lower the price of milk.^{1/}

In more than one-half of the markets in the United States for which prices were quoted in June, 1944, milk sold for a lower price at stores than off the retail route. In about two-thirds of these markets the differential was one cent per quart, while in a few of the larger markets it was as much as three cents.^{2/} The store differential is more in the larger markets because of the low costs of delivering milk to stores where a large volume of milk sales are made. The higher costs of labor is also a possible factor, as well as the additional labor required in making deliveries to large apartment houses with several flight of stairs.

In 1941, the costs incurred for selling and delivering a quart of milk were 5.26 cents to the doorstep and 2.34 cents to stores. A margin of one cent was charged by the storekeeper, making a total of 3.34 cents, or 1.92 cents less for store sales.^{3/} In a recent study, Dr. Spencer reported the

^{1/}Dow, George F., Milk Distribution Through Stores in the Portland Market, Maire Agri. Exp. Sta., Misc. Pub. No. 574, July, 1943, p. 1.

^{2/}Fluid Milk Prices in City Markets, U.S.D.A., B.A.E., June, 1944.

^{3/}Bartlett, R. W., Suggested Ways for Lowering Costs of Milk Distribution in Chicago, Ill. Farm Econ., Dept. of Agr. Econ., Univ. of Ill., No. 80, January, 1942, p. 197.

costs incurred for selling and delivering a quart of milk in New York in 1944 were 5.20 cents to homes and 1.85 cents to stores. The store-keeper's margin amounted to 1.5 cents, making a total of 3.35 cents.^{1/} The total costs for store sales were 1.65 cents less per quart.

These two studies were cited because the first one was made under the conditions of every-day delivery service while the other was made in a market where less than every-day delivery service prevailed. In both cases the selling and delivering costs were a little under two cents per quart less for store sales than doorstep deliveries. Other studies have been made and similar results reported.

In this study, 47 percent of the homemakers receiving doorstep delivery indicated a willingness to buy their milk exclusively from stores for two cents or less per quart (table 53). Fifty-two percent were not willing to give up their route delivery, and one percent was indefinite. Only 22 percent were willing to purchase the product exclusively at stores for one cent reduction in price.

When grouped according to income, Negro families were less reluctant for the change, followed by the white families in the low, middle and high income groups. Eighty-eight percent of the Negro families were willing to buy all milk at stores for two cents or less per quart, as compared with only 36 percent of the high-income white families.

There seems to be a definite correlation between the distance to the nearest store selling milk (up to four blocks) and the number of families

^{1/}Spencer, L., Costs of Distributing Milk in the New York-New Jersey Metropolitan Area, A Preliminary Report, Cornell University, Bul. A.E. 528, September, 1945, pp. 3.4.

Table 53.—Relation of family income to attitude of homemakers toward buying milk at stores

Family income	Families	Average blocks to nearest store	Proportion of families willing to purchase milk at stores for—			
			One cent less	Two cents less	More than two cents	Indefinite
<u>Group</u>	<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
White:						
Low	33	1.9	30	30	40	-
Middle	47	2.4	12	28	59	-
High	39	3.0	10	18	69	3
Negro:						
All	16	0.6	63	25	12	-
All groups	135	2.3	22	25	52	1

willing to purchase all milk at stores. About 94 percent of the families living less than one-half block, or 1.1 minutes walk, reported they would give up doorstep service for two cents, in contrast to only 33 percent of those living three or four blocks, or 7.1 minutes walk, away (table 54).

As long as over one-half of the retail route customers are unwilling to purchase milk exclusively from stores, one must conclude that this change for the city as a whole is undesirable. However, with a little emphasis placed on store sales in the low-income white and Negro sections, and a differential of one or two cents per quart in price, practically all sales could be made through this source. This would tend to increase the per capita consumption of milk in these groups where it is most needed and at the same time decrease the cost of delivering milk.

Table 54.—Relation of number of blocks between home and nearest store selling milk to attitude of homemakers toward buying milk exclusively at stores

Blocks between home and nearest store selling milk	Families	Average blocks to nearest store	Average minutes walk to nearest store	Proportion of families willing to purchase milk at store for a saving of—			
				One cent	Two cents	More than two cents	Indefinite
<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Less than one block	16	.5	1.1	63	31	6	-
One or two blocks	68	1.6	3.3	22	25	53	-
Three or four blocks	46	3.5	7.1	9	24	65	2
Five blocks or over	5	5.2	8.2	20	20	60	-
All groups	135	2.3	4.5	22	25	52	1

SUMMARY

The subject of milk delivery has received considerable and widespread attention for many years. Leaders and students of dairy marketing have advanced a number of ways designed to reduce the costs of milk distribution. However, no real progress was made in adopting these economies until the recent national emergency. Homemakers' reactions toward some recent changes made in the practice of milk delivery service, and of other proposed changes, were obtained in Roanoke, Virginia, during October, 1947. One hundred ninety-eight families were interviewed in four sections of the city.

This was the first study made in the State of Virginia on consumers' preferences for milk and milk delivery service.

Slightly less than two-thirds of the 198 families included in the study had all their milk delivered to the doorstep. Another one-fourth purchased all milk at stores, and only nine families, or five percent, made both doorstep and store purchases. Only two families purchased their main supply of milk from farms. Ninety-three percent of the high-income white families had all their milk delivered to the doorstep, as compared with only one-third of the Negro families. Families with four persons (both white and Negro races) depended somewhat more on retail milk delivery.

About 77 percent of the total quantity of milk was sold off the milk truck, 20 percent through stores, and three percent at farms. Based on whole milk equivalent, the daily per capita consumption for the 198 families was 1.3 pints. Negro families were largely responsible for the low-consuming group with 0.56 pints.

About two-fifths of the families receiving doorstep delivery had their milk delivered every-other-day.

Over one-half of the high-income white families used a special grade milk. In addition to whole milk, buttermilk was delivered to over one-half of the families, butter to one-third, and cream to one-fourth.

Almost one-third of the homemakers receiving doorstep delivery selected their milkman on the basis of recommendation by friends. The quality of milk or service was the basis of selection for 15 percent. Fourteen percent selected their dealer because he was the first one to solicit the business.

About four of every five homemakers expressed complete satisfaction with the service rendered by their deliveryman. The small proportion expressing dissatisfaction did so mainly because of time of delivery. Less than two-fifths of the families considered the quality of milk or service of their present dealer superior to others. The important reason for this belief was because of better taste or richer (more cream) milk. Fourteen percent said their deliveryman was dependable and courteous and they rated him superior for these reasons.

Eighty-seven homemakers having their milk delivered had tried other brands of milk during the past year. Almost three-fourths of them considered these brands equally as good as their present brand.

Homemakers in Roanoke had been receiving less than every-day delivery for over four years. Only 16 percent of the retail customers reported this type service had imposed a hardship. The amount of milk purchased per delivery rather than the type of refrigeration seemed to be the main reason for less than every-day delivery being unsatisfactory.

Only seven percent of the 135 families receiving retail delivery reported they were not willing to continue every-other-day delivery.

However, 12 percent were willing to pay one cent more per quart of milk to receive every-day delivery service.

Not a single homemaker requested that special deliveries and call-backs for collecting bills be resumed. They were also unanimous in their preference for the quart size container for milk in the retail trade.

The square bottle has been received by consumers with overwhelming enthusiasm and approval.

The most important reason for buying milk at stores was because of its convenience. The average distance between the home and nearest store selling milk for the 61 families buying milk from this source was one block, or an estimated walking time of 1.8 minutes, away.

The most significant facts revealed from this part of the study are that homemakers have accepted cheerfully the changes made in the practice of retail milk delivery and are desirous for their continuance. The square milk bottle, a recent change made by two of the dealers, has been overwhelmingly approved and should be considered by the other dealers.

The most frequent suggestion made by homemakers for the improvement of delivery service was for hoods to be put on all grades of milk.

Practically all of the 198 homemakers were conscious of the duplication of milk delivery service. Over one-half of them reported four trucks making deliveries along the street, one-third three, and only 11 percent two.

About 85 percent of the homemakers reported they would accept consolidated delivery for a saving of one cent or less per quart of milk. Slightly over three-fourths of the white families in the high and middle income groups were willing to give up their choice of a milk dealer, while

about 90 percent of the low-income white and Negro families were for the proposal, if it meant as much as one cent per quart reduction in price.

Slightly over one-half of all families interviewed expressed approval for a municipal milk distribution system for Roanoke. Only 46 percent of the 135 retail customers favored this proposal.

Only four percent of the 105 families reporting they would favor a municipal milk distribution system said they would patronize such, if operated in competition with the present dealers.

Forty-seven percent of the retail customers expressed a willingness to buy milk exclusively from stores if it meant two cents or less per quart reduction in price. About 88 percent of the Negro and 70 percent of the low-income white families reported they would favor this change.

With as many families willing to accept consolidated delivery for a reduction in price of two cents per quart of milk, serious consideration should be given this possible economy measure.

Exclusive store sales with a differential in price should be considered by the milk dealers in Roanoke and the State Milk Commission. This change offers possibilities for reducing the cost of milk, especially in the low-income white and Negro sections of the city.

In conclusion, this survey shows that homemakers in Roanoke are receiving satisfactory milk and milk delivery service. Consumers desire that less than every-day delivery service be continued. Practically all families are conscious of duplication in milk deliveries, and are willing to accept some method of consolidation to reduce it. Exclusive store sales is desired by a major proportion of the low-income white and Negro families.

APPENDIX

Enumerator _____

Area No. _____

Date _____ 1947

CONSUMERS' PREFERENCE STUDY
 Department of Agricultural Economics
 Virginia Polytechnic Institute
 Blacksburg, Virginia

Record No. _____

Name _____

Address _____

Dairy Products Purchased During the Past Week

Delivered by milk dealer						Bought at (store) (depot)						
Name _____						_____ minutes drive or			_____ blocks away			
						_____ minutes walk			_____ miles away			
Product	Unit	No. of deliv-eries	No. of units per delivery	Total units bought	Price per unit	Brand	No. times bought	No. units bought		Price per unit	Bottle deposit (cents)	Del. or carry
								Per trip	Total			
<u>Milk</u>												
Regular	Qt.											
	Pt.											
Special	Qt.											
Guernsey ()												
Vit. D. ()	Pt.											
Skimmilk												
<u>Cream</u>												
Heavy Whip)	Pt.											
	$\frac{1}{2}$ Pt.											
Light (Coffee)	Pt.											
	$\frac{1}{2}$ Pt.											
Buttermilk	Qt.											
Cottage cheese	Lbs.											
Butter	Lbs.											
Chocolate drink	Qt.											
	Pt.											
	$\frac{1}{2}$ Pt.											

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Questions for those Receiving Retail Milk Delivery

1. Days of delivery: M T W T F S S
2. If milk is not received every day, do you find this a hardship? (Yes___, No___)
In what way?_____.
3. Are you willing to continue receiving every-other-day delivery? (Yes___, No___)
4. Are you willing to pay one cent per quart more to receive every-day-delivery?
(Yes___, No___). How much more?_____.
5. How long have you been receiving milk from your present dealer?_____.
6. How did you happen to select this dealer?_____
7. Have you tried any other brands of milk in the past year? (Yes___, No___). If
so, did you like these brands as well as your present brand? (Yes___, No___).
If not, why?_____
8. How much more would you be willing to pay per quart of milk for favorite brand
and route man compared with a standardized product brought to your home under a
consolidated delivery plan?_____.
9. Do you consider the quality of milk or service offered by your present dealer
superior to that you would get from others? (Yes___, No___). In what ways_____
10. What size of container do you prefer for milk? (Pt.____, Qt.____, 1/2 Gal.____).
Cream? (Pt.____, 1/2 Pt.____).
11. What type of container does your present dealer use? (Round____, Square____).
12. What type of container do you prefer? (Round____, Square____). Why_____

13. What time of the day was your milk delivered this summer?_____.
In Winter?_____. Latest time of delivery that would be acceptable
to you; in Summer?_____, Winter_____. The earliest time
in Summer?_____, Winter_____.
14. Are you entirely satisfied with the service your milk dealer is giving you?
(Yes___, No___). Why?_____
15. Method of payment: (Cash on delivery___, Weekly___, Monthly___, Other_____
_____).
16. Would you be willing to purchase milk exclusively from Store for one cent less
per quart? (Yes___, No___). Two cents less per quart? (Yes___, No___).
17. Are you required to notify your route man or plant in advance of any change in
quantity of milk desired? (Yes___, No___).
18. Have you received any special deliveries in the past month? (Yes___, No___).
If so, how many?_____. Price?_____.

Questions for Those Buying at Stores

1. How long have you been purchasing fresh milk at stores? ____ Months.
2. What time of the day do you usually get your milk? _____.
3. What member of the family usually gets it? _____. Does it involve a special trip? Yes ____, No _____. Do you get milk regularly, even in bad weather? Yes ____, No _____.
4. If you buy from both dealer and store, what is the reason? _____
_____.
5. Type of store where milk is purchased: Chain ____, Independent _____, Dairy Bar _____, other (specify) _____.
6. Why do you purchase milk from store? Lower price _____, Convenience _____, Not home when delivery comes _____, Get exact quantity needed _____, allows daily purchase _____, other reasons _____
_____.
7. What brands of milk are handled in store? 1. _____
2. _____ 3. _____ 4. _____.
8. What dairy products are handled? Milk: Regular _____, Guernsey _____, Vit. D. _____; Cream: Light _____, Heavy _____; Buttermilk _____, Skimmilk _____, Butter _____, Cottage Cheese _____, Chocolate milk _____.
9. How much bottle deposit charge do you pay? _____.
10. Would you prefer all bottle caps for milk sold in stores be dated as of the day milk was delivered by the distributor? Yes ____, No _____.
11. Do you have a preference for a particular brand of milk? Yes ____, No _____.
12. How did you happen to select this brand? _____.
13. Have you tried any other brands of milk in the past year? Yes ____, No _____.
14. How much more would you be willing to pay per quart of milk for your favorite brand compared with a standardized product brought to the store under a consolidated delivery plan? _____.

Questions for all families

1. What type of refrigerator do you have? Ice _____, Mechical____, None_____.
2. How many quarts of milk can you store conveniently in your refrigerator at one time? _____. Is this sufficient for alternate day delivery? (Yes_____, No._____)
3. How many milk delivery trucks go by your house each morning?_____.
4. Assuming that the present dealers were bought out on a reasonable basis, would you favor a municipal milk distribution system for Roanoke? (Yes_____, No_____)
5. If a municipal plant were operated in competition with private dealers, which would you probably patronize? Municipal_____, Private_____, Uncertain_____.
6. Information about family.

Members of Household	Number	No. meals eaten away from home last week.
Homemaker		
Husband		
Others over 12 yrs.*		
Others 2 to 12 yrs		
Under 2 years		

* Include boarders, servants, etc.

7. Do you own your home? (Yes_____, No._____) If not, how much rent did you pay per month in 1940? \$_____ If owned, about how much would your home have rented for (unfurnished) before the war (1940)? \$_____ per month.
8. Number of rooms in house_____ or apartment_____.
9. Do you have a telephone? (Yes_____, No_____) A car? (Yes_____, No_____)
10. What was your approximate total income last year? Weekly \$_____, Monthly \$_____, Yearly \$_____. (Use Income Group Sheet)

INCOME GROUP SHEET

Group	Approximate total income of the family for the year 1947		
	Weekly	Monthly	Yearly
1	Under \$6	Under \$26	Under \$312
2	\$6 - \$10	\$26 - \$43	\$312 - \$520
3	\$11 - \$15	\$44 - \$65	\$521 - \$780
4	\$16 - \$20	\$66 - \$87	\$781 - \$1,040
5	\$21 - \$25	\$88 - \$109	\$1,041 - \$1,300
6	\$26 - \$35	\$110 - \$152	\$1,301 - \$1,820
7	\$36 - \$45	\$153 - \$196	\$1,821 - \$2,340
8	\$46 - \$55	\$197 - \$239	\$2,341 - \$2,860
9	\$56 - \$65	\$240 - \$282	\$2,861 - \$3,380
10	\$66 - \$75	\$283 - \$326	\$3,381 - \$3,900
11	\$75 - \$100	\$327 - \$435	\$3,901 - \$5,200
12	More than \$100	More than \$435	More than \$5,200

COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
STATE OF VIRGINIA

VIRGINIA POLYTECHNIC INSTITUTE AND
UNITED STATES DEPARTMENT OF
AGRICULTURE COOPERATING

EXTENSION SERVICE
BLACKSBURG, VIRGINIA

October 27, 1947

Dear Mrs.

On October , Mr. Russell Childress, a graduate student, interviewed you regarding your preferences for milk and milk delivery service.

We believe our study could be improved tremendously if we correlate the housewives' preferences with the families' approximate monthly income. So we are asking you to check the group number (see reverse side of this letter) on the left, which most nearly corresponds to your approximate average monthly income and return this information to us in the enclosed envelope, which requires no postage, at your earliest convenience.

Again thanking you for your cheerful cooperation given us in this consumer preference study, I am,

Sincerely yours,

Agr. Economist

JLM:rsc

Enc.

Income Groups

Group	Approx. monthly income of family
1	Under \$26
2	\$ 26 - \$ 43
3	44 - 65
4	66 - 87
(Check here) 5	88 - \$109
6	\$110 - \$152
7	\$153 - \$196
8	\$197 - \$239
9	\$240 - \$282
10	\$283 - \$326
11	\$327 - \$435
12	More than \$435

Please check group number at left which most nearly approximates your average monthly family income.