Dimensions of Consumer Attitude
in Fluid Milk Purchases with
Special Reference to Doorstep Delivery
vs. Store Purchases

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ACKNOWLEDGMENTS

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INTRODUCTION

Doorstep delivery of fluid milk, as a proportion of all fluid milk sales, has been steadily declining for a number of years. In 68 Federal order markets in 1966, only 25 percent of all fluid milk was delivered directly by processors to the doorstep.[2] The current predominance of store sales of fluid milk appears to be caused primarily by lower store prices for milk due to lower delivery costs.[3] Fluid milk handlers view this situation as a critical one for two reasons: (1) significant inefficiencies apparently exist in doorstep delivery, and (2) the increased emphasis on store sales substantially lessens the market power position of handlers.

The basic objectives of this investigation are to determine: (1) whether milk purchasers have a fundamental interest in doorstep delivery, and (2) whether consumers would accept certain cost-reducing changes in the delivery system.

SCOPE AND PROCEDURE

The first phase of this report relates to specific consumer buying habits which, in essence, provide a profile of consumer marketing activities with respect to dairy products. Some of the activities included in this profile are volume of consumption, place of purchase, frequency of purchase, and prevalence of other home delivery services. This phase of the analysis also examines the reasons underlying consumer purchasing decisions.

The second phase of this report is designed to test and supplement results of the first section. Factor analysis is employed as a technique to identify the several dimensions of consumer attitude in milk purchasing decisions, with particular emphasis given to store purchase vs. home delivery preferences. Analysis of variance is then applied to several of the more important attitude dimensions to determine whether attitudes of consumers are affected by selected socio-economic characteristics.

The consumer's decision to purchase milk at the store or on a home delivery basis is dependent upon a combination of economic, social, and psychological variables. To gain information on consumer attitudes, 1,200 household interviews were conducted in the Cleveland and Columbus, Ohio, markets. Approximately one-half of those interviewed purchased milk at the store, with the other half getting home delivery.

Forty-eight sample areas were chosen from the census tract maps of Cuyahoga and Franklin counties, which include Cleveland and Columbus, respectively. The tracts in each county were arrayed according to the median income for the tract and divided into three equal groups. Two-hundred interviews were conducted in the low, medium, and high income strata for a total of 600 interviews in each market. The eight census tracts in each income strata were randomly selected and necessary modifications were made where the chosen tracts were sparsely populated business or industrial areas.

The questionnaire for this study was divided into three sections. In the first section, customer buying habits and opinions toward milk purchases were identified. Section II included 60 statements designed to elicit the respondents' attitudes toward milk purchasing. In the third section, demographic data such as family size, education level, etc. were tabulated.

CUSTOMER BUYING HABITS AND OPINIONS TOWARD MILK PURCHASES

The different family and milk consumption characteristics of store customers and home delivery customers are indicated in Table 1. The family on home delivery has nearly one more member, an education level of almost one-half year higher, and a yearly income more than $1,700 greater than the family purchasing milk at the store. The extra family member may account for the fact that, among home customers, only 25 percent of the wives work outside the home. On the other hand, more than 42 percent of store customer wives are so employed. This suggests that many store customers do not receive home delivery because they are not at home during the day.

The table also shows that the home delivery customer purchases nearly twice as much milk as the store family. Even though part of this difference is

TABLE 1.—Family and Consumption Characteristics of Home Delivery and Store Customers Participating in This Survey.

Characteristic	Home Delivery Customer	Store Customer
Size of family	3.60 members*	2.72 members
Education of husband	11.95 years*	11.55 years
Education of wife	11.66 years*	11.25 years
Income of family	$8,320*	$6,580
Percent of wives employed outside of home	25 %	42 %
Percent living in single unit dwellings	84 %	69 %
Race	88 % white 12 % non-white	79 % white 21 % non-white
Quarts of whole milk consumed per week	11 (10-route)* (1 store)	6
Per capita weekly consumption of whole milk	3.16 quarts†	2.21 quarts

*Figures represent medians of total distribution.
†Computed by dividing actual quarts purchased at home and/or store by number of family members in each category.
Source: Original data.

TABLE 2.—Respondents' Reasons for Buying Milk at Store.

Reason	Percent
Price is lower at store	23
Store is more convenient	20
Milk consumption too small for home delivery	15
Not at home during day to refrigerate delivered milk	14
Milk consumption too variable or seasonal for home delivery	10
Milk billing problems with home delivery	8
Home delivery inconvenient	3
Never solicited by routeman	3
Other	4
Total	100

Source: Original data.

TABLE 3.—Degree of Willingness of Store Customers to Pay Higher Prices for Home Delivery as Related to Respondent's Income.

Cents per Half Gallon	Income Level			
	Less Than $5,000	$5,000- $10,000	More Than $10,000	All Store Customers
	%	%	%	%
0 cents	73.2	75.4	81.8	76.2
2 cents	11.4	8.1	11.2	9.8
4 cents	9.4	4.0	3.5	5.6
6 cents or more	1.5	1.7	0.7	1.4
Don't know	4.5	10.8	2.8	7.0
Total	100.0	100.0	100.0	100.0

Source: Original data.

attributable to the larger family size, per capita consumption is one-half quart per week greater for the home customer.

THE IMPORTANCE OF PRICE TO STORE CUSTOMERS

Historically, the home delivery business has justified the differential between the store and the delivery price on the basis of the additional service rendered. While this argument was legitimate in the days when refrigeration was inferior and distance to stores was great, modern technology has changed the picture. The decreased perishability of milk, larger and improved refrigerators, and the accessibility and convenience of supermarkets all lessen the marginal utility of the delivery service. Consequently, the value of this service for many customers is no longer as great and many have turned away from home delivery in favor of lower prices at the store.

This overview is supported by the findings in this study. When asked why they did not have home delivery, nearly one-fourth of the store shoppers complained that delivery prices were too high (Table 2) and one-fifth said the store was more convenient since they bought groceries there. Another 15 percent reported they were not at home during the day and a like percentage indicated that the family's consumption was too low for home delivery.

As indicated in Table 3, more than 75 percent of store customers are reluctant to spend even 1 cent per quart extra for home service. The strong em-

TABLE 4.—Store Customers Who Have Discontinued Home Delivery Within the Last 2 Years as Related to Level of Consumption.

| | Consumption Level | | | | |
| | Quarts per Week | | | | |
Response	0-5	6-10	11-20	21 and More	All Store Customers
	%	%	%	%	%
Have had home delivery within last 2 years	21.2	25.0	28.8	31.3	25.0
Have not had home delivery within last 2 years	78.8	75.0	71.2	68.7	75.0
Total	100.0	100.0	100.0	100.0	100.0

Source: Original data.

TABLE 5.—Percent of Store Customers Who Would Accept Home Delivery Assuming Equal Prices as Related to Level of Consumption.

| | Consumption Level | | | | |
| | Quarts per Week | | | | |
Response	0-5	6-10	11-20	21 and More	All Store Customers
	%	%	%	%	%
Would switch if price were same	23.6	43.5	50.3	41.3	37.2
Would not switch if price were same	76.4	56.5	49.7	58.7	62.8
Total	100.0	100.0	100.0	100.0	100.0

phasis on price helps explain why one-fourth of all store customers have switched from home delivery to the store within the past 2 years. Table 4 further illustrates that the largest proportion of delivery "dropouts" has occurred among those customers purchasing more than 10 quarts a week. Consequently, home delivery is left with a high proportion of low volume customers.

The findings in Table 5 also demonstrate that the price of milk is the primary consideration of store customers. Even though verbal replies to a questionnaire and the housewife's actual decision in the market are not always consistent, the responses suggest that 37 percent of the store customers could be attracted to home delivery under equal pricing circumstances. Even more significant is the fact that 48 percent of the large volume customers are so inclined. It should be emphasized that these families who consume more than 10 quarts a week are generally agreed to be the most profitable home delivery customers; although they comprise only one-third of store shoppers, they account for 70 percent of store milk sales.

THE IMPORTANCE OF PRICE TO HOME DELIVERY CUSTOMERS

Home customers generally pay at least 6 cents extra per half gallon for home delivery service.[4] This differential was 7 cents in Cleveland and 8 cents in Columbus during July 1967.[5] The differential has been lowered substantially in some recent instances due to reforms in home delivery. The willingness of home customers to pay 6 to 8 cents extra per half gallon implies that price is less important to them than to store shoppers. Traditionally, it has been assumed that the consumer's willingness to pay extra is closely associated with income.

While the average home customer earns a higher income, the analysis shows that income is decidedly not the primary determinant of consumer behavior. Evidence (Table 6) reveals that nearly one-fourth of

[4]Freeman, Robert E. June 1967. Farm Retail Price Spreads for Dairy Products 1939-1966. Econ. Res. Serv., U. S. Dept. of Agriculture, MRR 798, p. 8.

[5]Fluid Milk and Cream Report. U. S. Dept. of Agriculture, July 1967, pp. 4-5.

TABLE 6.—Income Distribution of Home Delivery and Store Respondents.

Income Level	Distribution by Customer Type		Distribution in Total Sample		
	Home Delivery	Store	Home Delivery	Store	Total
	%	%	%	%	%
Low income Less than $5,000	23.2	31.2	10.1	17.6	27.7
Middle income $5,000-$10,000	41.1	46.5	17.9	26.2	44.1
Upper income More than $10,000	35.7	22.3	15.6	12.6	28.2
Total	100.0	100.0	100.0	100.0	100.0

Source: Original data.

home delivery customers earn less than $5,000 per year, indicating that for them the higher costs of home delivery apparently do not offset its advantages.

While the survey data indicate that most home customers are willing to pay extra for doorstep delivery, the inclination to pay extra is not without limitations. Sixty percent of the home customers are reluctant to pay more than 4 cents per half gallon above the store price for delivery service (Table 7). Only 30 percent of home customers are willing to pay a differential of 6 cents or more. In determining the value of this service, the family's level of income becomes an important factor. Only 17 percent of the lower income customers are inclined to pay more than 4 cents extra per half gallon, compared to 37 percent of the upper income families.

Although less than one-third of home customers are content to pay the present differential, this proportion is significantly larger than the 1.4 percent of

store shoppers who would pay 6 cents or more (Table 3). Thus, the findings suggest that there is a definite difference between store and home customers' opinions toward price. Furthermore, while the responses of home customers reflect significant dissatisfaction toward the current price differential, 50 percent are willing to pay a 2 or 4 cent difference per half gallon. This inclination contrasts sharply with that of store shoppers, 76.2 percent of whom will not pay any differential for home service.

These differences of opinion are not fully explained by differences in incomes between home and store customers. While 55 percent of high income families have home service, the fairly high proportion of home delivery customers at lower income levels (37 percent of low income families and 40 percent of middle income families) tends to weaken the contention that income is the primary factor in the acceptance of home delivery.

TABLE 7.—Degree of Willingness of Home Delivery Customers to Pay Higher Prices for Home Delivery as Related to Respondent's Income.

Cents per Half Gallon	Income Level			All Home Delivery Customers
	Less Than $5,000	$5,000-$10,000	More Than $10,000	
	%	%	%	%
0	9.6	7.3	11.2	9.2
2	35.6	29.4	22.9	28.6
4	23.4	22.4	19.6	21.6
6	7.0	12.2	18.4	13.2
8	—	3.9	5.6	3.6
10	9.6	14.1	13.4	12.8
Don't know	14.8	10.7	8.9	11.0
Total	100.0	100.0	100.0	100.0

Source: Original data.

TABLE 8.—Incidence of Other Home Delivered Services for Home and Store Customers as Related to Income.

Service	Home Delivery Customers				Store Customers			
	Less Than $5,000	$5,000-$10,000	More Than $10,000	Total	Less Than $5,000	$5,000-$10,000	More Than $10,000	Total
	%	%	%	%	%	%	%	%
Have home delivery for bread	34.8	15.5	14.0	19.4	6.9	3.9	2.8	4.6
Have home delivery for laundry and dry cleaning	19.8	17.0	35.2	24.2	8.9	9.9	22.1	12.3
Have home delivery for other goods and services*	10.3	18.9	21.8	18.0	5.0	9.5	15.3	9.4

*Other goods and services include such products as coffee, juice, eggs, etc.
Source: Original data.

THE IMPORTANCE OF SERVICE TO HOME AND STORE CUSTOMERS

This study attempts to assess the importance of convenience and service to customers as a motivation for receiving home delivery. Section I of the questionnaire discloses that approximately 75 percent of all customers who changed to home delivery during the past year did so for the convenience reason.

The findings of Table 8 suggest that home customers also have a greater desire for the delivery of other goods and services than store customers. The prevalence of home delivered bread, laundry and dry cleaning, and other services (juice, eggs, coffee, etc.) is twice as great for home customers as for store shoppers. Although reasons for these buying habits may be numerous, the data suggest a greater need or appreciation among home customers for the convenience feature, which is not evident among store shoppers.

One of the fundamental problems of home service is the large number of customers who purchase a small quantity each week but continue to demand three deliveries per week. As Table 9 illustrates, more than 50 percent of all home delivery customers purchase 10 quarts or less per week or only 23 percent of the milk sold on the route.

Unless significant changes are made in the home delivery system, the low volume customer will continue to restrict the route's profit potential. Although it is often assumed that simply increasing the number of home customers would solve some delivery prob-

TABLE 9.—Consumer Profile of Respondents, by Source of Purchase, for the Combined Cleveland and Columbus Markets, August 1966.

Quarts Purchased Each Week	Store		Home Delivery		Total	
	Number of Customers	Volume Purchased	Number of Customers	Volume Purchased	Number of Customers	Volume Purchased
	%	%	%	%	%	%
0-1	4.5	0.4	1.0	0.1	3.0	0.3
2	17.8	3.0	8.3	1.2	17.6	2.2
3	20.9	3.9	11.4	1.9	16.6	3.0
4	37.7	10.4	21.8	5.1	30.4	7.9
5	38.7	10.9	22.6	5.5	31.3	8.3
6	50.6	18.0	33.4	10.6	42.8	14.5
7-10	66.6	31.6	52.1	23.4	59.8	27.8
11-15	83.2	52.7	65.4	37.2	74.8	45.4
16-20	91.1	67.7	84.4	65.0	87.7	66.4
21-30	97.1	96.1	96.9	89.0	96.6	87.5
31-50	99.4	96.9	99.6	98.7	99.6	97.7
More than 50	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 10.—Willingness of Home Delivery Customers to Accept Less Frequent Delivery as Related to Level of Consumption.

Response	Consumption Level, Quarts per Week				All Home Delivery Customers
	0-5	6-10	11-20	21 and More	
	%	%	%	%	%
Will accept once or twice a week delivery	85.0	56.1	47.8	34.1	56.3
Will not accept once or twice a week delivery	15.0	43.9	52.2	65.9	43.7
Total	100.0	100.0	100.0	100.0	100.0

Source: Original data.

FIG. 1.—Concentration of Milk Purchases by Store and Home Delivery Customers.
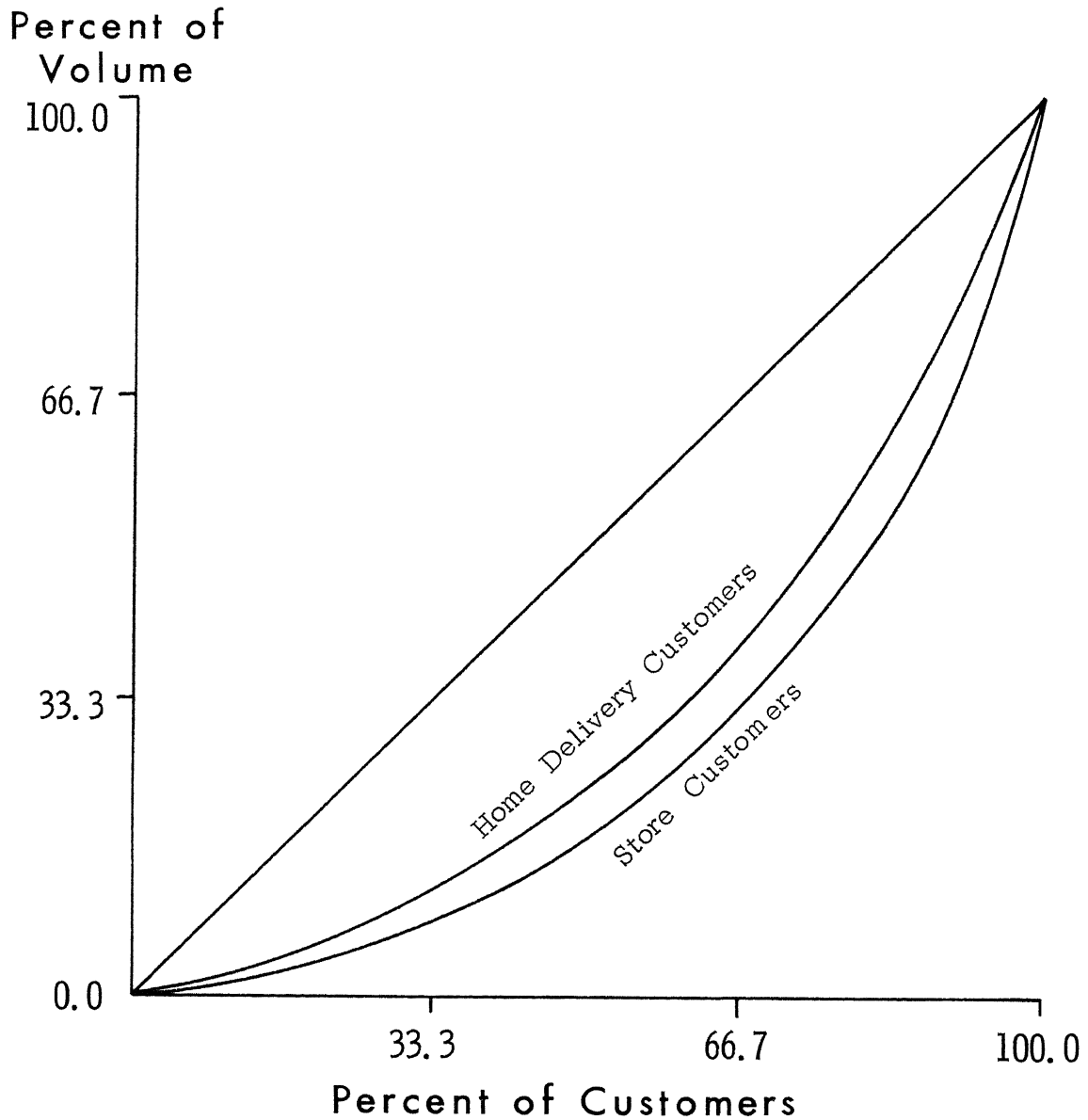
lems, Figure 1 graphically suggests that this might only magnify the problem. The lower curved line representing store customers signifies that milk purchases among these consumers are even more concentrated than among home customers; that is, a small percentage of customers purchase a large proportion of the volume. This means that a large number of store customers would purchase less milk than present home customers. While it is true that the large volume store customers could be very lucrative stops, Figure 1 shows that the proportion of such consumers is much smaller among store customers.

The supporting data for the store customer and home delivery customer curves in Figure 1 are included in Table 9.

The question to be asked at this point is whether home customers are willing to accept significant alterations in the present delivery system and whether store shoppers can still be attracted to a lower priced home service if deliveries are less frequent. Most home customers today receive milk deliveries three times a week.

When asked whether they would agree to one or two deliveries a week, 56 percent of the home customers answered affirmatively (Table 10). Even more revealing is the consumption breakdown, which shows that 68 percent of the 10 quarts or less customers would agree to this change. This percentage drops sharply for the larger volume categories.

Thus, at least one-fifth of home customers are willing without promotion or price incentive to accept less frequent delivery. If reluctant customers were enticed with lower prices to accept one or two deliveries, it is conceivable that many more would reconsider their decisions.

When the respondents were asked to express their opinions about once a week delivery, 40 percent of the 10 quarts or less customers (three times the number currently receiving weekly delivery) agreed to accept such a change if milk freshness could be assured (Table 11). Those opposed to the plan cited lack of space and milk souring as the main reasons for their disapproval.

The number of deliveries each week is one of the

TABLE 11.—Willingness of Home Delivery Customers to Accept Weekly Delivery as Related to Level of Consumption.

Response	Consumption Level, Quarts per Week				All Home Delivery Customers
	0-5	6-10	11-20	21 and More	
	%	%	%	%	%
Will accept once a week delivery	44.5	36.1	23.4	13.1	30.0
Will not accept once a week delivery	49.2	59.3	69.0	85.7	64.6
Don't know	6.3	4.6	7.6	1.2	5.4
Total	100.0	100.0	100.0	100.0	100.0

Source: Original data.

TABLE 12.—Current Frequency of Milk Purchases by Store Customers as Related to Level of Consumption.

Number of Purchases per Week	Consumption Level, Quarts per Week				All Store Customers
	0-5	6-10	11-20	21 and More	
	%	%	%	%	%
One	61.2	17.3	9.9	6.5	31.7
Two	34.2	39.9	26.1	16.1	32.2
Three	3.0	33.0	31.6	29.1	20.6
Four or more	1.6	9.8	32.4	48.3	15.5
Total	100.0	100.0	100.0	100.0	100.0

Source: Original data.

TABLE 13—Preferred Delivery Frequency of Store Customers as Related to Current Number of Purchases.

Number of Deliveries Preferred	Frequency of Store Purchases per Week			All Store Customers
	Once	Twice	Three or More	
	%	%	%	%
None	4.4	6.7	2.2	4.3
One	35.4	6.2	3.0	14.4
Two	38.8	49.3	16.5	34.2
Three	20.4	35.4	68.8	42.6
Four or more	1.0	2.4	9.5	4.5
Total	100.0	100.0	100.0	100.0

Source: Original data.

vital concerns in meeting customer needs. Nearly two-thirds of all store shoppers already purchase milk once or twice a week (Table 12). Since this percentage is almost double the 36 percent of home customers who purchase once or twice a week, it suggests that store customers would be more inclined to accept less frequent delivery.

Paradoxically, many store shoppers appear to prefer a home delivery system which delivers more frequently than they now buy milk at the store (Table 13). Only 35 percent of those who buy milk once a week would prefer weekly home delivery; 49 percent of those who buy twice a week would prefer two deliveries; and 69 percent of those who buy three times a week would prefer three deliveries. Most of these store customers agree, however, that they would accept one or two deliveries if necessary (Table 14). More than 65 percent are amenable to this arrangement compared to 56 percent of home customers, which indicates again that store shoppers are more predisposed to less frequent purchases and therefore would have fewer problems adapting to a new delivery structure.

Store shopper response to the question concerning once a week delivery adds more support to this contention. Table 14 shows that 33 percent of all store customers would accept weekly delivery, a percentage slightly higher than that for home customers.

Thus, the findings indicate that both home and store customers would be inclined to accept less frequent delivery. This does not suggest, however, that all customers should be serviced less frequently. Each route generally has a few high volume customers who can economically be serviced three times a week.

THE DIMENSIONS OF CONSUMER ATTITUDE

The consumer's decision to purchase milk at the store or on a home delivery basis is dependent upon a combination of economic, social, and psychological variables. Each of these variables may be thought of as a dimension of the consumer's attitude toward purchasing milk. Cognizance of attitude similarities and differences between home delivery and store customers should aid milk distributors in developing marketing strategies which meet the requirements of the consumer and provide a reasonable profit.

TABLE 14.—Willingness of Store Customers to Accept Less Frequent Delivery as Related to Level of Consumption.

Response	Consumption Level, Quarts per Week				All Store Customers
	0-5	6-10	11-20	21 and More	
	%	%	%	%	%
Will accept once a week delivery	34.5	42.7	32.5	23.4	33.0
Will accept delivery once or twice a week	79.4	68.5	48.4	30.0	65.2
Will not accept delivery once or twice a week	20.6	31.5	51.6	70.0	34.8
Total	100.0	100.0	100.0	100.0	100.0

Source: Original data.

In this section, the techniques of factor analysis are used to isolate and identify some of these dimensions of attitude. The relative importance of each of these in overall consumer attitude is measured and differences between the dimensions of attitude with respect to selected family characteristics (home or store customer, income, consumption level, race, employment of family) are examined.

Factor Analysis

For nearly 50 years psychologists have applied factor analysis to performance psychology.[6] The technique was devised to isolate the factors underlying individual differences in abilities or aptitudes as measured by test scores.[7] In recent years, other social scientists have used factor analysis to improve the understanding of human social behavior. More specifically, economists have used it to study consumer behavior.

Factor analysis[8] is a technique by which the individual's responses to a large number of statements, each designed to probe some attitude of the respondent, are combined into groups or clusters of statements so that each group is largely independent of every other group of statements. A large number of statements, many of which are highly related to other statements, is required for reliable results. For example, 2 of the 60 statements used in this study were: (1) Low milk prices are important to me, and (2) I like to buy milk at the store because the prices are usually lower. For the consumer to whom the price dimension is important, the response to either one of these would be expected to be highly related to the response to the other.

Some basic terms of factor analysis which will be used in the subsequent discussion are:

Factors: The characteristics associated with an isolated cluster of statements, with each factor largely independent of other identified factors. These are the dimensions of consumer attitude in this study.

Factor loading: A value which describes the closeness of the relationship between a statement and a single factor. The value, a correlation coefficient, has a range of -1 to $+1$. Values near -1 or $+1$ indicate a very close relationship, while a zero value is indicative of no relationship.

Communality coefficient (h^2): The proportion of variance in each statement explained by all factors,

collectively. It is the sum of the squared factor loadings for that statement.

Identification of the Dimensions

Responses to each of 60 attitudinal statements were collected from 1200 individuals. Some statements pertain directly to store shopping experiences, some focus upon various aspects of home delivery services, and some relate to characteristics common to both methods of milk purchasing. The intent of these statements was not to determine the consumer's satisfaction with her present buying patterns, but to ascertain her feelings on a broad range of topics regarding milk purchases. Each respondent was categorized as a home customer or store customer and the data for each group were analyzed separately.

The number of factors to be extracted, 12 in this study, is predetermined by the analyst. For each factor, the analyst selects the statements with significant factor loadings. Fruchter[9] indicates that factor loadings (absolute values) below .2 are not considered significant, while .2 to .3 is considered a low level of significance, .3 to .5 is a moderate level, .5 to .7 a high level, and above .7 a very high level of significance.

Because of the relatively high loadings on the factors, only loadings of .4 or above were considered when identifying the factors in this study. After each statement has been assigned to a factor on the basis of its loading, factors may be identified by a title which corresponds to the dimension of attitude which the set of statements in this factor represent.

Home Delivery Customers

The identified factors and order of extraction for home delivery customers are presented in Table 15. Determinations of dimension titles and rotated factor loadings are given in the appendix. Order of extraction is based entirely on the variance explained by the factor.

The extracted factors, collectively, normally do not explain total variance of each statement. The 12 factors explained 55.6 percent of total variance of the statements in the home delivery customer analysis. The unexplained variance is attributable to factors not identified within the analysis and to random error. In the home delivery analysis, six statements were not significant.

Store Customers

The 12 dimensions identified for store customers (Table 16) include several which were also extracted for the home delivery customer. Collectively, the 12 factors explain 54.4 percent of the total statement variance. Eight of the statements are not signifi-

[6] Wolf, D. 1940. Factor Analysis to 1940. Psychometric Monograph, No. 3.

[7] Jonassen, Christen T. and Sherwood H. Peres. 1960. Interrelationships of Dimensions of Community Systems. The Ohio State University Press, Columbus, p. 5.

[8] A lucid description of this technique can be found in Social Statistics by Hubert M. Blalcok, Jr., McGraw-Hill Book Company, Inc., New York, 1960, pp. 383-389.

[9] Fruchter, Benjamin. 1954. Introduction to Factor Analysis. D. Van Nostrand Company, Inc., Princeton, N. J., p. 151.

cantly related to any of the 12 isolated factors. Determinations of dimension titles and factor loadings are given in the appendix.

While the factors isolated by factor analysis identify some dimensions of attitude for home delivery and for store customers, the analysis itself does not measure importance of any single dimension. The dimensions identified for store customers are very similar to those identified for home delivery customers. The only exception is factor L in each group. This was identified as *time of delivery* for home delivery

customers and included one significant statement, (51) *delivery by breakfast*. In the store customer analysis, this statement was one of the eight which was not significantly related with any factor. For store customers, factor L was titled *shopping influences*. Of the three statements included in this dimension of attitude, one statement, (49) *like one brand,* was one of the statements with insignificant loadings in the home delivery analysis.

Note that while the dimensions of attitude for each group are similar, the variance of the statements

TABLE 15.—Dimensions (Factors) Identified for Home Delivery Customers.

Factor	Dimension Title	No. of Statements in Factor*	Percent of Variance Explained†
A	Store Advantages	14	10.6
B	Container Type	4	6.0
C	Brand Selection & Social Influences	5	5.6
D	Home Delivery Advantages	8	4.3
E	Product Selection & Routeman Service	5	4.5
F	Prices	3	4.2
G	Large Size Containers	3	4.2
H	Routeman Bother	3	4.0
I	Frequency of Purchase	3	3.6
J	Small Size Containers	2	2.9
K	Payment for Milk	3	2.9
L	Time of Delivery	1	2.3
	Total	54	55.6

*Number of statements with factor loadings above .40.
†Percent of total variance among all statements explained by the factor.
Source: Original data.

TABLE 16.—Dimensions (Factors) Identified by Store Customers.

Factor	Dimension Title	No. of Statements in Factor*	Percent of Variance Explained†
A	Home Delivery Advantages	14	10.0
B	Container Type	4	5.9
C	Store Advantages	7	5.4
D	Prices	5	5.1
E	Brand Selection & Shopping Pleasure	3	4.3
F	Routeman Bother	3	4.1
G	Frequency of Purchase	4	3.9
H	Large Size Containers	3	3.7
I	Small Size Containers	2	3.2
J	Product Selection & Routeman Service	2	3.0
K	Payment for Milk	2	3.0
L	Shopping Influence	3	2.9
	Total	52	54.5

*Number of statements with factor loadings above .40.
†Percent of total variance among all statements explained by the factor.
Source: Original data.

explained by each factor are quite different between ths two groups. Unexpectedly, for the home delivery customer group, the *store advantages* dimension explained the greatest amount of variance (10.6%) of the statements; for the store customer group, the *home delivery advantages* dimension explained the greatest amount (10.0%).

Importance of Factor Dimensions

One measure of the importance of a dimension of attitude to the consumer is the mean score for all respondents for all statements in that factor. Strong agreement (disagreement) with a statement is indicated by selection of a number from the upper (lower) end of the 1 to 7 scale.[10] Strong agreement or disagreement with a statement indicates that that item is important to the respondent. Selection of a mid-range value (3, 4, 5) conversely indicates no strong feelings and, therefore, a relatively unimportant statement. The value 4 would indicate complete indifference.

Mean factor scores for the six factors which explained the most variance are given in Table 17. For example, the factor score 5.96 for *prices* for store customers is the mean of all store customer responses to the five statements (14, 26, 7, 3, 2). Note that the mean factor scores for the same factors for the two types of customers may involve some different statements. Therefore, comparisons of factor scores for common factors between the two groups is not always valid.[11] Comparison of factor scores within a customer group is valid, with a score of 1 or 2 indicating an intensity of feeling equal to (but in the opposite direction of) a score of 6 to 7.

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[10]A —3 to +3 scale was used on the schedule but this was transformed to a 1 to 7 scale for analysis and presentation.

[11]The prices factor score for store customers uses statements (14, 26, 7, 3, 2), while the same factor for the home delivery customer uses statements (14, 26, 2). Therefore, a comparison of these two scores is not valid.

The factor scores for store customers clearly illustrate the importance of *milk prices*. This very high score of 5.96 indicates strong agreement to statements regarding prices or low prices. The second factor score (5.15) signifies general agreement with statements concerning *store benefits*. Ranking closely behind *store advantages* is *routeman bother* (5.03), a factor which reflects dissatisfaction with leaving notes and having to be at home when the milk is delivered or shortly thereafter. The *container type* score for store customers (4.79) signifies a preference for paper containers, whereas a similar factor score for home delivery customers (4.74) denotes a partiality toward glass containers.

Store customers like the opportunity to select among several brands when shopping for milk, which is an attitude dimension connected to their fondness of the shopping experience. Home customers, on the other hand, are moderately opposed to *brand selection* (2.83). They apparently are satisfied with the brand they receive, think that one brand is best, or think that milk brands are identical. This factor also indicates that home customers dislike social and promotional influences.

The factor score (3.52) suggests that store customers are generally indifferent to the conveniences and services of *home delivery*. The closeness to the indifference point may imply that these customers are not necessarily opposed to service but that, under present circumstances, such services may be unnecessary or too expensive. Home customers, however, feel quite strongly that these services are necessary and worthwhile. Their score for *home delivery advantages* (5.67) signifies that these consumers greatly appreciate the convenience and services offered by home delivery. Nonetheless, the prices paid for such features are very important to them. The *prices* factor score (5.66) refutes the hypothesis that home customers are generally uninterested in price.

TABLE 17.—Mean Factor Scores for Six Factors Identified by Store and Home Delivery Customers.

Store Customers		Home Delivery Customers	
Factor	Factor Score	Factor	Factor Score
Prices	5.96	Home delivery advantages	5.67
Store advantages	5.15	Prices	5.66
Routeman bother	5.03	Container type (glass)	4.74
Container type (paper)	4.79	Product selection and routeman service	4.26
Brand selection and shopping pleasure	4.57	Brand selection and social influences	2.83
Home delivery advantages	3.52	Store advantages	2.63

Source: Original data.

Surprisingly, home customers are not greatly interested in *product selection* and *routeman services*. Even though the score (4.26) implies slight agreement to the statements, many apparently feel indifferent toward these services. The very low score (2.63) for *store advantages* indicates disagreement with statements regarding store convenience.

In Tables 15 and 16, it was noted that for home delivery customers, the *store advantages* dimension explained the greatest amount of statement variance; for store customers, the *home delivery advantages* occupied that position. In contrast to this, on the basis of factor scores, *store advantages* were very important to the store customers and *home delivery advantages* were less important or even a disadvantage. For the home customer, there was an intense agreement with *home delivery advantages* and intense disagreement with *store advantages*.

In summary, the factor scores generally support conclusions formed in the previous section on the attitudes of consumers. The store shopper is primarily interested in price when buying milk. She appreciates the advantages the store offers and dislikes the bother of routemen, but her general attitude about home delivery service is one of indifference. The home customer is also concerned about price. She likes the advantages afforded by the routeman, but implies that these conveniences can be foregone if prices become too high.

EFFECTS OF CUSTOMER TYPE AND FAMILY CHARACTERISTICS ON DIMENSIONS OF CONSUMER ATTITUDE

Twelve nearly identical dimensions of attitude have been identified for home delivery and for store customers and the factor scores indicate marked differences in factor importance between these two groups. To examine the statistical significance of these differences, an analysis of variance model is used.

Four dimensions, common to each group, have been selected—*prices, store advantages, home delivery advantages,* and *frequency of purchase*. Criteria used for selecting the four dimensions included: (1) the dimension must be common to each customer group, (2) for the dimension (factor), there must be at least three common statements in that factor for the two groups, and (3) selected dimensions are of primary interest to this study.

Analytical Technique

Six variables representing the four common dimensions were formed as a summation of the statement scores in each dimension. With the exception of the *prices* dimension, only statements which appeared in the given dimension in both customer groups were used. The store customers had five statements

(14, 7, 26, 3, 2) in the factor *price*. Home delivery customers had only three of these statements (14, 26, 2) included in the *prices* factor. However, in the home delivery group, factor loadings with *price* for statements (7) and (3) which appeared in the *store advantages* factor were .38 and .40, respectively. This indicates that while these two statements were assigned to factor A, they were also associated with *price*. Consequently, the five statements were used for all respondents for the *price* dimension.

The statements used in each of the four dimensions are as follows:

1. **Price Dimension**
   2. I like milk prices clearly identified at the store.
   3. I like to buy milk from the store because the prices are usually lower.
   7. I like the opportunity to take advantage of milk specials at the store.
   14. Low milk prices are important to me.
   26. The price is important to me in purchasing milk.

2. **Store Advantages Dimension**
   5. I like to buy milk at the store because milk can be refrigerated sooner.
   6. I prefer buying milk at the store because milk is left over if I buy from the routeman.
   19. I prefer buying milk at the store because the milk is fresher.
   24. I prefer buying milk at the store so it does not remain outside until I return from work or shopping.
   34. I like to buy milk at the store because it is near my home.
   37. I prefer buying milk at the store because I only have to purchase what I need.
   52. I prefer buying milk at the store because of day-to-day changes in milk consumption.
   56. I have to buy groceries so it's easy to buy milk also.

3. **Home Delivery Advantages Dimension**
   1. I like the convenience of home delivery.
   8. I like to purchase milk from the routeman because the milk does not remain in the car in hot weather.
   12. It is easier to have home delivery than to go to the store.
   16. I like home delivery because I don't have to return bottles to the store.
   17. I like home delivery because I need milk more often than groceries.
   25. I like home delivery because I don't like to carry home heavy milk cartons.
   42. I like home delivery because I dislike bottle deposits.

4. **Frequency of Purchase Dimension**
   4. I like to purchase milk once a week.
   10. I like to purchase milk three times a week to assure freshness.

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15. I like to purchase milk more than three time a week to assure freshness.

The six dependent variables for the analysis were formed by summing for each respondent the scores (1 to 7 range) for each set of statements. These were then divided by the number of statements in the set to find a mean score for that factor. Variables 1, 2, and 3 represent the *price, store advantage,* and *home delivery advantage* dimensions, respectively. Variables 4, 5, and 6 are associated with the *frequency of purchase* dimension and represent respondent agreement with once a week, three times a week, and more than three times a week deliveries, respectively.

Agreement with once a week delivery (high score on statement 4) logically is consistent with disagreement with more frequent deliveries (low score on statements 10 and 15). Therefore, to form variable 4, the score on statement 4 is added to the 7-complement (7 minus the score) of the score for statements 10 and 15. For example, if a respondent marked 6, 3, and 1 as the scores of statements 4, 10, and 15, the value of variable 4 (a preference for once a week delivery) would be (6+ (7—3) +(7—1)) /3, or 5 1/3. Variables 5 and 6 are formed similarly.

Differences in these mean factor scores (variables) for each respondent were examined. This was done with a set of two-way analysis of variance models designed to test several hypotheses. These hypotheses, expressed in general form, are that importance (level of agreement or disagreement) attached to each dimension (factor) is affected by neither customer type nor, successively, by level of milk consumption, size of family, level of income, race, and working housewife.

Effects of Customer Type

The factor scores of Table 18 indicate that the type of customer has an effect on the individual's dimensions of attitude. In addition, the results of an analysis of variance testing the hypotheses that no differences in attitude exist between types of customer for each of the six measures are presented. The third type of customer (home-store) includes those home delivery customers who also bought milk at the store. Among the 1200 respondents, 78 were in this category. The estimated factor scores are the least square estimates of the factor scores from the analysis of variance model.

The value of 5.95 for store respondents on the *price* dimension indicates strong agreement. Recall that 7.0 is maximum agreement or like, 1.0 is maximum disagreement or dislike, and 4.0 is complete indifference or neutrality. This high value compared to the 4.79 value of home customers implies that store customers place a greater importance on the price dimension. This comparison does not suggest, however, that home customers are unconcerned about price. It merely states that store shoppers are relatively more concerned about price than home customers and that this concern is significantly different at the .1 percent level.

The range of 1.16 units for price represents the difference between the two extreme values. Its size is a measure of differences between the attitudes of the extreme groups. The arrow is used to indicate the direction of increasing factor scores and that the middle group (home-store combination) has a factor score between those of the store only and home only customers. For example, the price dimension value for home-store customers lies between the store and home delivery values and therefore is not presented. However, when the home-store value becomes an extreme, as in Test 4, the value is included. The 2.80 value signifies strong disagreement or dislike toward *once a week delivery*. The store customer is least opposed to this frequency, although a value of 3.72 still indicates slight dislike.

TABLE 18.—Attitude Differences Between Store and Home Customers.

| Test No. | Attitude Dimension | Estimated Factor Scores by Type of Customer | | | | Rejection Level of Significance |
		Store	Home-Store	Home	Range	
						%
1	Price	5.95 <——		4.79	1.16	0.1
2	Store advantages	5.00 <——		2.55	2.45	0.1
3	Home advantages	3.64 ——>		5.77	2.13	0.1
4	One delivery a week	3.72	2.80	3.32	0.92	0.1
5	Three deliveries a week	4.49 ——>		5.22	0.73	0.1
6	Four or more deliveries a week	3.83	3.98	3.74	0.24	5.0

Source: Original data.

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Tests 2 and 3 reveal a wide range of difference between home and store customers. As one would expect, the store customer likes the *store advantages*, whereas the home customer has a strong dislike for these features. On the other hand, the home customer strongly agrees with *home advantages*, while the store shopper is relatively indifferent toward these attributes.

Test 5 shows that home customers have a stronger preference for *three deliveries a week* than store shoppers. Although store-home customers consider *four deliveries* more important than either store or home customers, the range of .24 is quite small and all values indicate considerable indifference. The dimension values for Test 5 are higher than Tests 4 and 6, suggesting that all customers still prefer three deliveries.

In summary, the data show that store customers are more price conscious than home delivery customers, are partial to store advantages, are indifferent toward home delivery attributes, and prefer the same number of deliveries as home customers. These conclusions support the findings in previous sections and demonstrate again the importance of price in attracting store customers to home delivery.

Effects of Consumption Level

The results of a two-way analysis of variance testing the hypotheses that the six variables (dimen-

sions) are affected by neither customer type[12] nor milk consumption level are presented in Table 19. Level of milk consumption has a significant effect on all variables but the one associated with *four or more deliveries* (Test 6).

From Test 1, *price* considerations become more important as consumption level increases. Note, however, that price is important to customers at all levels of consumption.

While all consumers are rather indifferent to *store advantages*, consumers at high consumption levels approach disagreement. All customers like the *home advantages* but the high volume consumers like them to a greater degree. Large volume consumers have larger families and appear to appreciate the conveniences afforded by home delivery.

The presence of significant interaction between the effects of customer type and consumption level on *one time delivery* is evidenced by a greater range of scores for store customers than for home delivery customers. Note that for low-volume consumers, the store customer, although indifferent, is slightly more agreeable with a one time delivery.[18] Large-volume customers dislike the single delivery and strongly desire the *three time delivery*. *Four time delivery* is not important to any customer group, regardless of consumption.

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[12]Significant interaction between consumption and customer type in Table 19 is indicated by the presence of factor scores for both store and home customers. Thus, for the **one delivery a week** dimension, interaction was significant ($\alpha = .05$). The rejection level of significance refers to the consumption level classification. Significant interaction in Tables 20 to 23 will be shown in the same manner.

[18]With the exception of the cases in which interaction was significant, the factor scores and differences for customer type (home, store) are in close agreement with those in the one-way analysis (Table 18). Therefore, estimated factor scores for customer type can be taken from Table 18 unless interaction is indicated in Tables 19-23 (see footnote 12). Then factor scores from the two-way analysis of variance models should be used.

TABLE 19.—Attitude Differences by Milk Consumption Level.

Test No.	Attitude Dimension	Estimated Factor Score by Consumption (Qts. per Week)				Range	Rejection Level of Significance*
		0-5	6-10	11-20	21+		
							%
1	Price	5.17	——————>		5.70	0.53	0.1
2	Store advantages	3.81	<——————		3.34	0.47	0.1
3	Home advantages	4.65	4.93	4.92	5.04	0.39	0.1
4	One delivery a week	Store 4.67	<——————		2.53	2.13 ⎫	
		Home 3.98	<——————		2.67	1.31 ⎬	0.1
5	Three deliveries a week	4.35	——————>		5.31	0.96	0.1
6	Four or more deliveries a week	Store 3.61	——————>		4.31	0.70 ⎫	
		Home 3.72	3.68	3.76	3.85	0.17 ⎬	N.S.

*Rejection level associated with differences attributable to level of consumption.
Source: Original data.

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This analysis denoted the strong emphasis on price by large volume customers. Yet these customers are partial to home delivery but on a three-times-a-week delivery basis.

Family Size

Results of the tests of the hypotheses that the six dimensions of attitude are affected by neither customer type nor family size are given in Table 20. Consumer concern with *price* increases significantly with increases in family size. This is expected since larger families are generally high volume consumers. While family size has no significant effect on attitude toward *store advantages* and *home advantages*, it is seen that home customers strongly disagree with store advantages and store customers are somewhat indifferent to home advantages. This is as expected. The large family, which generally has a larger consumption, strongly rejects *once a week delivery. Three deliveries per week* are desired by all families but particularly by the large family.

TABLE 20.—Attitude Differences by Family Size.

Test No.	Attitude Dimension	Estimated Factor Scores by Family Size				Range	Rejection Level of Significance
			Small (1-2)	Medium (3-4)	Large (5+)		%
1	Price		5.15	——>	5.75	0.60	0.1
2	Store advantages	Store	5.20	<——	4.73	0.47	N.S.
		Home	2.48	——>	2.59	0.17	
3	Home advantages	Store	3.33	——>	4.06	0.73	N.S.
		Home	5.78	5.74	5.79	0.05	
4	One delivery a week	Store	4.52	<——	3.02	1.50	2.5
		Home	4.26	2.91	2.95	1.35	
5	Three deliveries a week		4.55	——>	5.15	0.60	
6	Four or more deliveries a week		3.68	——>	3.97	0.29	5.0

Source: Original data.

TABLE 21.—Attitude Differences by Income Level.

Test No.	Attitude Dimension	Estimated Factor Scores by Income ($)				Range	Rejection Level of Significance*
			0-5,000	5,000-10,000	10,000+		%
1	Price		5.52	5.65	5.31	0.34	1.0
2	Store advantages		3.67	<——	3.46	0.21	N.S.
3	Home advantages		4.94	<——	4.86	0.08	N.S.
4	One delivery a week		3.63	<——	3.11	0.52	0.1
5	Three deliveries a week	Store	4.25	4.64	4.55	0.39	0.1
		Home	4.74	——>	5.60	0.86	
6	Four or more deliveries a week	Store	3.69	——>	3.94	0.25	N.S.
		Home	3.87	<——	3.67	0.20	

*N.S. indicates not significant at 5 percent.
Source: Original data.

TABLE 22.—Relationship of Income to Family Size and Milk Consumption.

	Income Level		
	Less Than $5,000	$5,000-10,000	More Than $10,000
Members in family	2.2*	3.3	3.5
Fluid milk consumed per week per family	5.0 qts.*	9.5 qts.	10.0 qts

*Figures represent median values.
Source: Original data.

TABLE 23.—Attitude Differences Between White and Non-White Races.

Test No.	Attitude Dimension	Estimated Factor Score by Race		Range	Rejection Level of Significance*
		White	Non-white		
					%
1	Price	5.50	5.60	0.10	N.S.
2	Store advantages	Store 5.05	4.81	0.24	N.S.
		Home 2.45	3.22	0.77	
3	Home advantages	Store 3.53	4.10	0.57	1.0
		Home 5.81	5.45	0.36	
4	One delivery a week	3.26	3.43	0.17	N.S.
5	Three deliveries a week	5.03	4.58	0.45	0.1
6	Four or more deliveries a week	3.85	3.87	0.02	N.S.

*N.S. means not significant at 5 percent.
Source: Original data.

TABLE 24.—Attitude Differences Between Working and Non-Working Wives.

Test No.	Attitude Dimension	Estimated Factor Score by Wife Employment		Range	Rejection Level of Significance*
		Working	Non-working		
					%
1	Price	5.54	5.46	0.08	N.S.
2	Store advantages	3.57	3.60	0.03	N.S.
3	Home advantages	4.92	4.84	0.08	N.S.
4	One delivery a week	3.25	3.33	0.08	N.S.
5	Three deliveries a week	4.96	4.99	0.03	N.S.
6	Four or more deliveries a week	3.89	3.88	0.01	N.S.

*N.S. means not significant at 5 percent.
Source: Original data.

Income Level Effects

The results of a two-way analysis of variance testing the hypotheses that the six dimensions of attitude are affected by neither customer type nor income are presented in Table 21.

The *price* dimension is important to all customers, regardless of income. Note that the high income consumers are less price conscious than either of the two lower groups. Family size and milk consumption increased sharply from the low income family to the medium income family (Table 22). This contributes to the medium income group being most price conscious. High income is associated with less price importance, even though family size and milk consumption are similar to that of the middle income group.

The importance of *store advantages* and *home advantages* is not affected by income level. A slight appreciation is shown by all customers for home delivery advantages but general indifference is shown for store advantages.

A strong preference by all home customers is indicated for *three time delivery* and a dislike on the part of high income customers for *one time delivery*. Indifference prevailed among all with respect to *four time delivery*. Increasing income, as well as being a home customer, is associated with greater preference for *three time delivery*.

Effects of Race

The results of two-way analysis of variance testing the hypotheses that neither customer type nor race has any effect on the six dimensions of attitude (Table 23) indicate that race affects only feelings about *three time delivery* and *home advantages*. The white customer has a strong preference for *three time delivery*.

With respect to *home advantages*, the white home consumer group appears to feel most strongly. Furthermore, they dislike to a greater extent the *store advantages* than the non-white home customer. However, significant interaction between race and consumer type to some extent prevents the finding of significant effects due to race.

Employment of Wives Outside of the Home

The results of the analysis of variance tests of the hypotheses that the six dimensions of attitude are affected by neither customer type nor by working wife (Table 24) indicate that whether or not the wife works outside of the home has no effect.

SUMMARY AND CONCLUSIONS

The future role of the milk handler will be determined to a large extent by structural and competitive adjustments occurring in the fluid milk processing and distributing industry. The economic requirements of the business, the technological improvements, and the shifting centers of bargaining power have led to significant increases in market concentration. Many small and medium sized handlers who were unable to adjust to these many changes have been forced to make major adjustments in their modes of operation. Many simply sold their business while others merged or consolidated their operations. Still others found new avenues to the consumer, such as captive dairy stores. This latter movement has been stimulated by the gradual decline in home delivery sales and the aggressive marketing strategies adopted by food stores.

The reduction in home delivery sales has been particularly alarming to many milk processors. For many processors, this system of distribution is the only available avenue to the consumer. Yet with the decreasing volume and the low productivity of home delivery, many handlers seek assistance in an effort to make this method of delivery more efficient.

The purpose of this study was to determine consumer reactions to some rather basic changes in the home delivery system deemed essential to making the system more efficient. While this study does not deal with actual cost reductions that might accrue if certain changes are made, it does evaluate consumer reactions to possible changes in the system and identifies the characteristics of families most interested in home delivery service. The major findings of this study were:

- Annual family income of the home delivery customer is $1,700 greater than that of the store customer, although 25 percent of home delivery customers were in the lowest income group. Home delivery customers consume almost twice as much milk per family as the store customers. However, this is closely associated with their larger families and more family members in the age groups which consume more milk per capita. Higher levels of education, a greater proportion of Caucasians, and a lesser proportion of wives employed outside the home are other characteristics of the home delivery customer which contrast with the store customer.

- Forty percent of all households buy 10 or more quarts of milk per week and these households purchase 70 percent of the total volume.

- Price is the most important single factor in the shift from home delivery to store sales. More than 75 percent of all store customers are reluctant to pay any additional amount for the home delivery service. This clearly emphasizes the problem faced by milk processors in their efforts to convince present

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store customers to utilize home delivery. While both store and home delivery customers are price conscious, the large volume store customer places greatest importance on price. The store customer also is indifferent to the benefits of home delivery. While the large volume store customer likes the benefits of home delivery, he is very price oriented and apparently is unwilling to accept costs currently associated with the home delivery services. The importance of price increases with family size and decreases with income.

• In the two markets studied, more than one-fourth of all store customers switched from home delivery during the past 2 years. Most of the customers who made this switch were among the large volume customers (10 quarts or more per week). This switch, therefore, had the effect of increasing the concentration of low volume customers on home delivery routes.

• Approximately one-half of the large volume store customers would return to home delivery if the price was the same. These large volume customers currently buy 70 percent of the milk sold at stores.

• Price seems less important to home delivery customers and most of them are willing to pay at least 4 cents per half gallon more for this service.

• Store customers feel it is more convenient to purchase milk at the store, while 75 percent of the home delivery customers feel it is more convenient to have milk delivered. This is consistent with the mean factor scores which indicate that store customers like store advantages and home delivery customers like home advantages. Furthermore, the high-volume customer has greater preference for home delivery benefits and greater disagreement with store advantages. Further evidence indicates that home delivery customers prefer to have other household products and services delivered.

• Most home delivey customers currently have milk delivered three times a week, while store customers frequently buy milk once a week. A majority of store customers and home delivery customers would accept once or twice a week delivery. However, less than one-third of each of these groups are willing to accept one delivery per week. More than 75 percent of this latter group willing to have milk delivered only once a week is composed of consumers buying 10 or fewer quarts per week.

Evidence from the factor analysis indicates that the store customer is rather indifferent to once a week delivery and has a slight preference for three times a week delivery. Within the store customer group, the large volume customer has a strong dislike for once a week delivery and preference for three times a week delivery. More important is that the low volume

store customer has a greater acceptance of once than of three times a week delivery. Family size, which is closely correlated with level of consumption, affects frequency of delivery attitudes in a similar manner. As incomes increase, attitudes toward frequency of delivery change from indifference to a dislike for one time delivery and a strong preference for three time delivery. Attitude differences between races indicate only that the white consumer has a greater preference for three time delivery than the non-white. Attitudes toward four or more deliveries per week reflect indifference to mild dislike.

• There is a slight preference of the store customer for paper containers and of the home delivery customer for glass containers.

• While store customers show a very slight preference for being able to select brand, the home customer rejects its importance.

The fundamental elements of this analysis are found primarily in the attitudes of consumers toward price and frequency of delivery. As the milk dealer evaluates his home distribution system, it is apparent that his options are mainly limited to changing frequency of delivery and volume per delivery. The cost reductions resulting from such adjustments would be expected to permit the pricing of milk sold at the doorstep to be much more competitive with milk sold through stores.

The primary limit on what a milk dealer can do in reforming home delivery is found in consumer attitudes and preferences. Information about these attitudes and preferences indicate what consumers require, what they desire, and what they will accept in terms of alternative home delivery arrangements. In addition, these attitudes can be differentiated to indicate what is required to retain current home delivery customers and what is required to attract store customers to home delivery.

Large volume store customers represent the greatest potential for expanding the home delivery system. These customers are the most price sensitive of any group of consumers. As such, it becomes essential that the milk dealer institute reforms in home delivery which will tend to reduce the store-home price differential. Such reforms would also tend to retain large volume users who are currently on home delivery routes.

While large volume store customers are very price-conscious, they are not particularly sympathetic to the less frequent delivery adjustment which would necessarily be required to reduce home delivery prices. This presents the milk dealer with his basic challenge in reforming home delivery. Since the milk dealer is in a "no choice" position, however, a deliberate and

planned process of reducing delivery frequency, increasing volume per delivery, and adjusting home-delivery prices is essential. This involves acceptance of the consumer mandate on prices, while continuously and systematically building routes of customers who are willing to accept less frequent delivery. While management may find this direction a difficult one to accept and implement, it is evident that consumers, with their emphasis on price, are making such a direction a necessity.

APPENDIX
Factor Identification and Factor Loadings

Home Delivery Customers

The rotated factor loadings for responses of the home customers are presented in Appendix Table I. The 14 significant statement loadings for Factor A are listed in descending order in the first column of the table. The numbers in bold face in each column include the significant loadings for that factor and the associated statements belonging to the factor label heading the column. Minor exceptions occur in instances in which a statement may be significant (loading > .40) for two or more factors. Since a statement may occur in only one factor, the statement is assigned to the factor which has the largest loading. The last six statements in the table have no significant factor loading and are therefore included with no factor.

Some factor loadings in the table are negative. As with correlation coefficients, this only indicates an inverse relationship between statement and factor. The degree (closeness) of relationship is indicated by the nearness of the absolute value of the loading to ± 100. Rather than indicating characteristics which are favorable or unfavorable, the presence of both positive and negative loadings within a factor indicates that there is a set of one or more statements for which a response of 7 points on a 1 to 7 scale is consistent with a 1 response for one of the other statements. For example, under Factor B, an agreement (positive loading) with statement (43) on the like for glass containers is consistent with disagreement (negative loading) with statement (36) on the like for paper containers.

Examination of the statements within each factor suggests titles for factors A through K for home delivery customers (Table 15). The first statement (19) in Factor A, "I prefer to buy at the store because the milk is fresher," has a very high factor loading of .72. This high loading suggests that perhaps Factor A will be identified as milk freshness. The second statement (6), "I prefer the store because milk is left over if I buy from a routeman," also implies concern for milk freshness. However, the inclusion of statements such as (47), "I prefer to buy milk at the store because my milk bill seems smaller," necessitates a much broader interpretation. A title such as *store advantages* more appropriately identifies the dimension of consumer attitude. Factor A lists a variety of reasons why consumers prefer to purchase milk at the store. Included are milk freshness, lower prices, convenience, husband influence, and variable consumption. Although statement (55), "I prefer to buy milk from the routeman because I never run out of milk," has a loading of —.48, it is consistent with the *store advantages* dimension. Identification of titles for the remaining factors (B through K) has been determined in a similar manner and will not be discussed in further detail.

Store Customers

For store customers, factor loadings for each statement are given in Appendix Table II. The significant statements for a factor again are suggestive of a title for that factor. Thus, Factor A in the store customer group is identified as *home delivery advantages*. Factor B is readily identifiable as *container type*. Three statements indicate a strong preference for paper containers, while the fourth shows a high negative loading for glass containers. This cluster of statements signifies that consumers who like paper containers strongly dislike glass containers, and vice versa. Although Factor D implies that low prices are an advantage of buying at the store, the inclusion of statements (14), "Low milk prices are important to me," and (26), "Price is important to me in purchasing milk," necessitates a broader interpretation. It cannot be assumed that store prices are always lower than home delivery prices and, therefore, the factor must be titled *prices*.

Two distinct ideas are suggested in Factor E. Statements (32) and (31) identify the preference of some customers to select among several brands. The third statement (30), "I like to go grocery shopping," implies a similar avocation and the factor is appropriately titled *shopping pleasure*. The remaining factors are similarly identified.

TABLE I—Rotated Factor Loadings for Home Delivery Customers.*

Statements†		Factors												
		A	B	C	D	E	F	G	H	I	J	K	L	h²‡
19	Store milk fresher	**72**	—03	—17	—15	03	00	05	11	04	—11	—05	10	61
6	Milk left over with H.D.	**70**	00	—06	03	14	—03	—01	—05	—11	—01	—03	—05	54
5	Cool milk sooner at store	**69**	—06	—08	10	—07	10	03	—00	—07	—07	—05	—12	53
52	Consumption varies	**65**	01	—20	—21	—08	05	—12	27	08	07	—01	11	63
24	Dislike milk on doorstep	**61**	—01	—14	—09	—16	08	—02	13	06	—03	06	—09	47
37	Buy what I need at store	**60**	—13	—33	—18	—08	11	03	15	02	—01	—11	—01	57
34	Store near my home	**50**	02	—37	—08	—04	19	—12	15	04	—01	—10	—07	48
56	Need groceries anyway	**50**	—02	—22	—28	—06	20	—00	22	01	—05	—03	14	48
47	Store bill smaller	**49**	—09	—34	—10	—19	06	05	16	—13	15	12	13	51
55	Always enough milk with H.D.	**—48**	—02	—02	39	03	03	10	—12	01	—10	11	11	45
59	Use little milk	**46**	05	—08	—14	—07	—06	17	48	—21	02	00	—03	56
3	Store prices lower	**47**	—10	—04	—03	—10	40	—07	04	—06	01	—20	11	46
44	Husband prefers store	**46**	—00	—38	05	03	—21	—02	15	03	00	—15	10	46
7	Milk specials at store	**42**	—08	—22	—03	—08	—38	—22	01	—07	14	—12	22	52
36	Like paper cartons	03	**—92**	—04	—02	—10	06	—05	00	—02	—00	—00	—01	87
23	Dislike washing bottles	14	**—90**	—03	—01	—03	04	—06	01	—01	00	—00	02	83
43	Glass containers	04	**89**	—01	10	06	—07	19	—02	03	07	04	02	86
35	Paper carton—no deposit	13	**—89**	—12	00	—04	04	—04	04	—04	03	02	—02	83
29	Prefer advertised milk	12	—11	**—63**	00	—03	01	—11	—15	14	—01	—14	—12	51
32	Compare brand quality	25	—03	**—61**	—07	13	14	—08	11	—04	22	—01	08	55
31	Compare brand prices	35	—06	**—57**	—08	14	27	—12	10	—05	11	—01	02	59
33	Neighbors get H.D.	21	05	**—54**	09	15	—05	—14	17	00	01	04	—13	44
39	Like stamps at store	40	—09	**—54**	—04	—00	10	—14	14	07	—08	—03	01	52
25	Dislike carrying cartons	—05	05	07	**70**	17	—02	11	—13	—03	—08	—03	02	56
16	Dislike bottle return	—18	04	04	**68**	06	02	06	—04	05	—05	06	09	53
42	Dislike bottle deposits	06	—15	11	**55**	06	00	13	02	—05	07	18	—26	48
12	Delivery easier than store	—38	08	—08	**46**	04	—03	01	—21	17	—05	—00	38	59
17	Need milk frequently	—14	01	02	**42**	10	03	—00	—09	38	—24	03	25	48
1	Like convenience of H.D.	41	09	—20	**42**	02	—01	—04	—19	14	—07	04	29	54
8	Milk doesn't sit in car with H.D.	—39	19	—14	**41**	13	08	—12	—05	—03	—10	04	—06	43
45	H.D. milk fresher	—26	17	—17	**41**	34	—09	—01	07	05	06	11	—01	44
21	Like talking to milkman	04	—03	—11	08	**75**	07	—10	—14	—02	05	05	—00	63
20	Like product information	—07	08	—01	14	**66**	19	—06	—08	—10	—06	—06	10	54
38	Good selection with H.D.	—21	07	—09	13	**60**	—07	10	—10	—09	00	—01	—07	47
11	Delivery after breakfast	—04	04	—01	01	**48**	04	—00	04	24	—10	18	—13	35
27	Good selection at store	06	—09	—20	—07	**—43**	49	—02	—06	—01	—18	08	06	53
26	Prices important	12	—10	—05	17	08	**73**	—03	06	02	19	—03	—19	67
14	Low prices important	10	—08	—07	07	12	**71**	—08	12	10	19	—00	—06	62
2	Prices identified	—07	—07	00	—17	03	**48**	—20	—03	05	—03	11	30	42
50	Like 10-qt. dispenser	—03	—23	—09	—03	10	09	**—82**	08	—09	—08	03	03	78
54	10-qt. dispenser is cheaper	01	—17	—13	—01	02	08	**—82**	07	—06	—00	05	17	76
41	Gallon container	22	09	—15	00	—03	02	**—48**	—09	—13	21	13	—01	40
58	Dislike staying home with H.D.	28	04	—14	—12	—04	08	—06	**72**	00	—06	—04	02	65
57	Dislike leaving notes	28	—05	—14	—13	—08	14	—12	**69**	—03	—08	—07	—03	66
60	Dislike routeman bother	49	—07	—02	—10	—12	—06	—03	**53**	—16	08	—12	—04	60
10	Purchase three times a week	—06	04	—01	06	—04	05	16	—11	**80**	03	06	09	70
4	Purchase once a week	16	—08	—04	07	—09	03	—13	08	**—74**	—05	—03	—11	64
15	Purchase four times a week	30	—01	—12	12	—10	10	—01	08	**55**	—09	—06	—15	48
22	Half-gallon container	04	08	—09	—01	00	07	15	—07	—11	**83**	—02	02	76
18	Quart container	09	07	—01	10	—04	—19	42	—02	10	**—72**	01	—00	77
13	Pay bill bi-weekly	—07	—03	11	13	—01	—04	—02	—07	03	—06	**78**	15	68
46	Better idea of bill with H.D.	—19	—03	—11	18	27	08	—14	11	02	08	**58**	00	53
48	Dislike future bill	22	—06	—18	02	—07	01	03	33	—11	03	**—50**	06	47
51	Delivery by breakfast	13	04	10	07	—09	—06	—14	07	09	05	09	**62**	48
9	Courteous milkman	—29	—01	01	16	26	21	—02	—11	—01	—20	09	34	40
28	Talk to friends at store	12	03	—39	02	11	37	20	—06	02	—16	06	04	40
30	Like grocery shopping	13	—01	—32	—10	32	20	15	02	—28	—01	00	21	42
40	Milk put in refrigerator	—08	—02	—32	04	—04	04	—37	02	—13	03	42	—04	45
49	Like one brand	—22	08	—29	12	32	09	22	27	—12	12	10	09	43
53	Husband prefers H.D.	04	—00	—37	18	31	—13	—08	26	07	—03	10	00	38

*Expressed in percent in this table rather than as a decimal percentage.
†The statements have been numbered and abbreviated to save space.
‡h² is the communality coefficient of a statement.

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TABLE II.—Rotated Factor Loadings for Store Customers.*

Statements†		A	B	C	D	E	F	G	H	I	J	K	L	h²‡
								Factors						
16	Dislike bottle return	77	—05	—06	08	—04	—09	—06	—06	—03	—06	05	04	62
25	Dislike carrying cartons	74	01	—11	01	04	—04	—04	05	01	—10	—01	—01	58
12	Delivery easier than store	64	—04	—20	12	—13	—22	—03	—04	13	09	08	—00	56
17	Need milk frequently	63	—08	—15	12	—06	—10	—31	04	—05	—08	—06	00	57
42	Dislike bottle deposits	61	14	—04	01	08	13	—04	06	—06	—08	07	—06	45
55	Always enough milk with H.D.	60	—06	—24	07	07	—17	03	28	01	01	—20	08	59
8	Milk doesn't sit in car with H.D.	59	—06	—16	03	14	—07	07	14	06	—14	07	—03	46
1	Like convenience of H.D.	57	—09	—21	09	—09	—22	02	00	12	12	01	03	47
21	Like talking to milkman	52	—03	00	—08	42	—13	—07	18	01	—01	—08	—00	52
20	Like product information	50	02	—01	04	42	—07	—07	24	—07	21	—19	—02	58
46	Better idea of bill with H.D.	50	—04	—06	—07	21	—16	01	12	—11	—02	—40	12	53
13	Pay bill bi-weekly	50	—02	02	02	—03	—11	09	05	01	06	—43	—04	46
45	H.D. milk fresher	49	—04	—05	—15	16	—09	02	22	—06	11	—21	19	45
38	Good selection with H.D.	45	03	—07	—02	29	—12	—05	12	—06	19	—25	09	43
36	Like paper cartons	—07	93	07	00	03	06	03	04	—01	04	01	—04	89
23	Dislike washing bottles	—04	91	09	03	02	07	06	—03	—02	04	—01	—05	84
43	Glass containers	13	—89	—01	—01	03	—05	—05	03	—08	—01	—01	05	82
35	Paper carton—no deposit	03	84	16	04	07	09	02	—05	—02	—01	04	—04	76
37	Buy what I need—store	—19	14	68	02	—08	11	05	—05	01	16	18	06	60
52	Consumption varies	—13	—01	58	04	08	15	—08	—10	08	10	14	—11	45
6	Milk left over with H.D.	—04	—04	56	01	02	08	18	03	14	—20	—02	—12	43
5	Cool milk sooner at store	—15	03	55	14	09	19	—05	—04	02	—09	—31	17	53
34	Store near my home	—08	06	53	17	09	—07	—03	06	—18	—05	06	14	39
24	Dislike milk on doorstep	—10	13	41	13	—00	28	—06	—06	—16	06	—16	16	47
56	Need groceries anyway	—14	24	49	05	07	08	10	—05	—05	22	27	04	47
14	Low prices important	12	—05	05	79	08	02	—07	—02	—11	01	05	—07	68
26	Prices important	16	—03	08	79	13	06	—09	07	—06	06	05	—03	70
7	Milk specials at store	04	08	11	64	20	—01	—04	06	—14	07	11	15	53
3	Store prices lower	01	01	13	63	00	04	—03	—06	—03	06	12	31	53
2	Prices identified	—07	02	04	47	05	02	—05	04	09	45	—14	—10	47
32	Compare brand quality	12	—06	04	11	72	09	—06	09	—03	04	09	—01	57
31	Compare brand prices	05	06	00	36	70	05	—01	02	—05	—08	13	—10	66
30	Like grocery shopping	01	02	10	04	50	—01	06	—16	—04	—01	03	36	42
58	Dislike staying at home with H.D.	—17	06	17	07	—08	80	04	—01	—01	12	05	12	75
57	Dislike leaving notes	—15	12	15	08	02	80	01	—07	—04	02	15	06	74
60	Dislike routeman bother	—24	07	—22	—01	01	70	08	—11	05	—15	12	03	66
10	Purchase three times a week	16	—04	05	10	12	—01	—80	05	—01	07	02	06	70
4	Purchase once a week	07	13	09	—01	03	—03	78	10	03	—10	—09	—05	67
15	Purchase four times a week	22	—06	12	04	07	—05	—68	06	01	—21	01	00	58
59	Use little milk	—02	01	35	—17	04	19	50	—08	29	—11	07	—03	56
54	10-qt. dispenser is cheaper	17	—02	—05	08	—01	—06	—02	81	—00	04	—06	01	71
50	Like 10-qt. dispenser	16	—00	—16	13	—02	—08	—01	77	01	02	07	07	68
41	Gallon container	19	—15	02	—04	11	09	—03	42	—17	—32	07	—01	40
18	Quart container	07	07	04	—13	03	—02	07	—09	86	—04	—08	—03	79
22	Half-gallon container	05	—01	08	18	04	—01	—06	—07	—83	—02	01	—00	74
9	Courteous milkman	21	01	04	10	—00	02	—08	00	—01	57	—01	—12	40
27	Good selection at store	—15	05	32	22	04	—04	—05	—01	—10	41	18	23	44
48	Dislike future bill	—08	04	13	13	16	14	—08	04	—08	06	62	—04	48
47	Store bill smaller	06	—00	10	33	08	06	—06	07	—04	—07	51	34	53
44	Husband prefers store	—01	—13	08	03	—02	10	—13	07	06	—13	04	60	44
39	Like stamps at store	07	12	02	21	32	14	03	08	12	—20	08	43	44
49	Like one brand	12	—20	—07	—01	05	09	—02	06	—15	10	—12	42	30
11	Delivery after breakfast	39	—09	03	15	23	07	—16	09	12	18	06	05	34
19	Store milk fresher	—20	—08	37	16	14	17	—16	—05	10	—34	—12	26	49
28	Talk to friends at store	14	13	31	09	40	—04	—05	—13	—03	00	03	32	42
29	Prefer advertised brands	05	07	13	12	37	—13	—03	08	13	—21	—09	30	36
33	Neighbors get H.D.	30	—09	15	—10	26	—04	—10	26	13	—40	—06	06	46
40	Milk put in refrigerator	21	02	04	—22	05	—07	05	34	01	—02	07	25	29
51	Delivery by breakfast	39	—01	04	—03	12	13	—16	21	—01	22	—08	13	33
53	Husband prefers H.D.	30	—02	13	—10	04	—06	—06	33	14	—30	—29	13	44

*Expressed in percent in this table rather than as a decimal percentage.
†The statements have been numbered and abbreviated to save space.
‡h² is the communality coefficient of a statement.

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