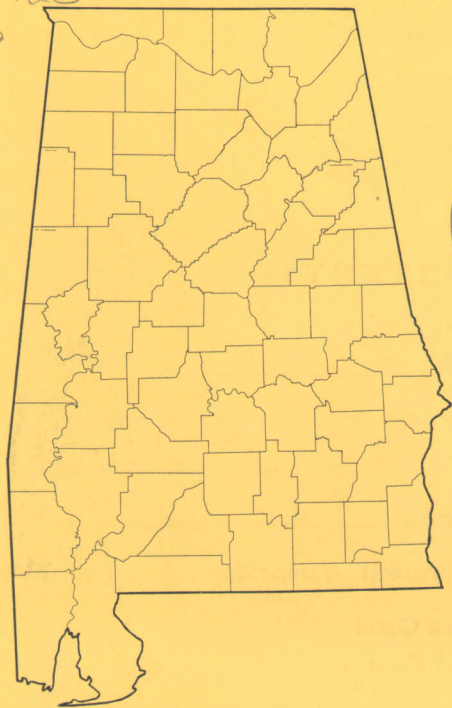
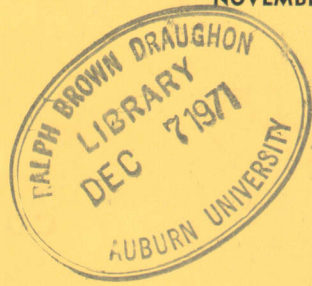


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**ROLE of
INCOME and
FOOD COSTS**

in

MILK PRODUCT USE

by

ALABAMA URBAN FAMILIES, 1968



**Agricultural Experiment Station
AUBURN UNIVERSITY**

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Auburn, Alabama

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*Role of Income and Food Costs in Milk Product Use by Alabama Urban Families, 1968*¹

RUTH A. HAMMETT²

INTRODUCTION

SURVEYS OF families in the United States have aroused interest by many agencies in the quality of food intake by the American people. While lack of sufficient income to buy good nutrition is recognized as a major constraint, poor dietary practices exist in all income levels. Foods needing most emphasis are milk and nonfat milk products, fruits and vegetables, and foods high in iron.

Dairy products are one of the food groups in the Basic Four. Fresh fluid milk and manufactured forms, such as cheese, contribute excellent quality protein, minerals, and vitamins to the nutritional content of human food. Milk products also provide enjoyment at meal and snack times, and many foods owe their distinctive flavor and appearance to dairy products. Most American families use some form of milk every day and spend about 15 per cent of the food dollar for dairy products.

The average American family spends 17 per cent of disposable income for food, but the low income family spends a much larger proportion. Frequency of food purchases and the direct involve-

¹ This study was supported by Hatch and State research appropriations. It is based on a contributing project to the Southern Regional Food Marketing Research Project SM-35 in which Alabama, Georgia, Kentucky, Mississippi, South Carolina, Tennessee, Texas, and Virginia are cooperating.

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ment of the homemaker in what is often the family's largest expenditure makes her keenly aware of this recurrent cost. When income is limited, pressure of other family needs may result in purchase of economical forms, smaller quantities, or omission of a particular food.

This study was concerned with investigation of the influence of selected characteristics of families on the allocation of food money for dairy product purchases. The specific objectives were:

(1) To determine the effect of income, income-related family characteristics, and weekly food costs on the use of dairy products and milk equivalent classes.

(2) To determine at what level of income and food costs milk product use was inadequate or optimum.

Findings should assist in an understanding of factors affecting the decline in consumption of some dairy products.

THE FAMILIES

The sample of 801 white and 124 Negro families was selected in the spring of 1968 as the Alabama contribution to a regional study of social theories and consumer motivations. Milk products were used as a vehicle to test actual behavior. The project design resulted in a nonrepresentative population sample of Alabama urban families but provided an opportunity to study the use of dairy products in groups stratified by income and city size.

The three cities selected for the survey were widely separated in location and differed in size and racial proportions. Dothan is located in southeastern Alabama, Tuscaloosa in the northwestern section, and Huntsville in the northern tier of counties. The 1970 Census lists Dothan as having a population of 36,733, Tuscaloosa 65,733, and Huntsville 137,802 persons. In 1960, Dothan and Tuscaloosa had a nonwhite population of around 28 per cent, and Huntsville had about 14 per cent. The survey sample was 20 per cent nonwhite in the smaller cities and 8 per cent in Huntsville, or a survey average of 13 per cent.

In a sample of Alabama urban households, Negro families usually have about half the annual or per capita income of white families. However, at equal levels of income or food costs, Negro families use smaller amounts and fewer varieties of dairy products than white families. Previous studies by the author have shown

that the races constitute separate universes in the use of milk products (1,2,3).

Income of Negro families in the total sample was approximately 43 per cent of that of white families. Tuscaloosa Negro families had the highest annual and per capita income and the lowest size of family in that race. Huntsville families, especially the Negro, had above average family size. In white families, annual family and per capita income increased with city size.

The distribution of annual family and per capita income of sample families in the survey cities was as follows:

| <i>Annual family and per capita income</i> | <i>White Dol.</i> | <i>Negro Dol.</i> |
|--|-----------------------|-----------------------|
| Annual income | | |
| Dothan..... | 8,566 | 3,480 |
| Tuscaloosa..... | 9,244 | 4,734 |
| Huntsville..... | 10,660 | 4,179 |
| All cities..... | 9,992 | 4,255 |
| Per capita income | | |
| Dothan..... | 2,809 | 1,176 |
| Tuscaloosa..... | 2,981 | 1,615 |
| Huntsville..... | 3,014 | 1,084 |
| All cities..... | 2,975 | 1,342 |

Only families of two or more persons who had eaten at least one meal a day at home the 7 days previous to the interview were included in the study. Respondents were personally interviewed by mature, fulltime homemakers who were carefully trained and closely supervised throughout the study. Sample families were selected by appropriate statistical procedures.

COST OF FEEDING A FAMILY

Family food costs depend on many factors such as weather, transportation costs, family size, age and sex of family members, meals away from home, use of convenience foods, emphasis on quality, or guest meals.

A realistic approach to understanding family allocation for food expenditures is the amount necessary for adequate nutrition, when adjusted to age and sex of family members and current prices. Such a plan at five cost levels has been developed and kept current by the Consumer and Food Economics Branch of the Agricultural Research Service, USDA. Plans are based on quantities of food needed to meet the nutritional recommendations of the National Research Council. Weekly expenditures for the mod-

erate cost plan, by region, age, and sex, at the time of the survey are shown below:

| <i>Food at home for 1 week, moderate cost plan, by age and sex</i> | <i>December 1968</i> | |
|--|----------------------|-----------------------|
| | <i>U.S. Dol.</i> | <i>South Dol.</i> |
| Children under 1 year..... | 4.20 | 3.90 |
| 1 to 2 years..... | 5.30 | 4.90 |
| 3 to 5 years..... | 6.50 | 5.90 |
| 6 to 9 years..... | 7.80 | 7.20 |
| Girls, 9 to 11 years..... | 8.90 | 8.20 |
| 12 to 14 years..... | 9.90 | 9.10 |
| 15 to 19 years..... | 9.80 | 9.10 |
| Boys, 9 to 11 years..... | 9.10 | 8.40 |
| 12 to 14 years..... | 10.90 | 10.00 |
| 15 to 19 years..... | 12.10 | 11.10 |
| Women, 20 to 34 years..... | 9.10 | 8.50 |
| 35 to 54 years..... | 8.70 | 8.20 |
| 55 to 74 years..... | 7.50 | 7.00 |
| 75 years and over..... | 6.70 | 6.30 |
| Men, 20 to 34 years..... | 10.50 | 9.60 |
| 35 to 54 years..... | 9.70 | 9.00 |
| 55 to 74 years..... | 8.80 | 8.20 |
| 75 years and over..... | 8.50 | 7.90 |

Costs are given for a family of 4. For other size families, adjust thus: 1-person, add 20 per cent; 2-persons, add 10 per cent; 3-persons, add 5 per cent; and 5-persons, subtract 5 per cent; 6-or-more persons, subtract 10 per cent (4).

Based on estimates by the homemaker of weekly food costs and yearly income, the average white family was spending 17 per cent and the average Negro family 22 per cent of annual income for food. Lowest income families were estimated to be spending as much as 80 per cent of the income for food. Nearly 30 per cent of the white families had incomes in excess of \$13,000, and 12 per cent is probably higher than the food:income ratio for these families.

Four-fifths of the Negro families had incomes under \$6,000, whereas four-fifths of the white families had incomes over that amount. The average food cost for Negro families was 85 per cent of that of white families at any specified income level. Average size of family and percentage of food bill spent for milk was almost identical by race. White families spent \$7.74 per person for food and \$1.17 for milk products during the study period. Negro families averaged \$4.69 for food and \$0.67 for milk products.

In all families, an increase in income was related to larger expenditures for food but a decreasing percentage of yearly food cost to annual family income. The correlation of food costs and income in both races was one of the few cases in which white and Negro families reacted in the same manner, Table 1.

TABLE 1. CALCULATIONS OF FOOD COST AS PART OF FAMILY INCOME BASED ON USUAL WEEKLY FOOD EXPENDITURES, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Annual income | White families food cost | | | Negro families food cost | | |
|------------------------------------|-----------------------------|-------------|-------------|-----------------------------|-------------|-------------|
| | Weekly | Yearly | Of inc. | Weekly | Yearly | Of inc. |
| <i>Dol.</i> | <i>Dol.</i> | <i>Dol.</i> | <i>Pct.</i> | <i>Dol.</i> | <i>Dol.</i> | <i>Pct.</i> |
| Under 1,500 ¹ | 15.50 | 806 | 81 | 12.33 | 641 | 64 |
| 1,500-2,999 ² | 18.50 | 962 | 38 | 15.83 | 823 | 33 |
| 3,000-4,499..... | 19.69 | 1,024 | 19 | 16.64 | 865 | 23 |
| 4,500-5,999..... | 24.58 | 1,278 | 24 | 22.33 | 1,161 | 21 |
| 6,000-7,999..... | 25.53 | 1,328 | 19 | 22.73 | 1,182 | 17 |
| 8,000-9,999..... | 29.24 | 1,520 | 17 | 24.80 | 1,290 | 14 |
| 10,000-12,999..... | 32.44 | 1,687 | 16 | 31.00 | 1,612 | 15 |
| 13,000 and over ³ | 34.41 | 1,789 | 12 | 0 | 0 | 0 |
| Average..... | 29.41 | 1,529 | 17 | 18.28 | 951 | 22 |

¹ Use \$1,000 as yearly cost figure.

² Use midpoint of range as yearly income in calculating percentage of income spent for food up to \$13,000.

³ Use \$15,000 as yearly income for food cost calculations.

MILK EQUIVALENT—NUTRITIONAL YARDSTICK

Milk products form one of the four groups of foods that specialists recommend for optimum nutrition. Current concern with improving the quality of diets eaten by American people emphasized the importance of studying the effect of food cost and income on use of milk products. Reduction of dairy products to six milk equivalent classes provided a nutritional yardstick that measured adequacy of milk use in each family. For example, a pound of American cheese had the protein-mineral value of 3.2 quarts of fresh whole milk.

Sweetmilk equivalent included various whole milk types, chocolate milk, and skim milk. All forms of cheese were placed together. Evaporated milk, condensed milk, and infant formulas were the canned milk group. Dry milk forms were placed together, and all frozen desserts were the ice cream equivalent.

Milk requirements in the moderate cost food plan provided the standard for recommended milk equivalent. Adjustments for age of family members and the percentage of meals eaten at home fitted the recommended milk equivalent to needs of a particular family. In the sample, 20 per cent of the possible 21 meals per person per week had been eaten away from home. Recommended amounts of milk equivalent in the moderate cost plan were as follows:

| Age | Recom. milk |
|----------------------------|---------------------|
| | equivalent per week |
| Up to 9 years of age..... | Qt. 5.0 |
| 10 to 12 years of age..... | 5.5 |
| 13 to 19 years of age..... | 7.0 |
| 20 years and over..... | 3.5 |

Total milk equivalent used, divided by the recommended amount, provided "Percentage milk equivalent used of recommended," a measure of the degree to which dairy product use fitted the nutritional requirements of a family. Division of sweetmilk used by total milk equivalent gave a "sweetmilk ratio" which measured the proportion of fluid milk, usually consumed as a beverage, to total dairy products consumed.

Sweetmilk equivalent accounted for nearly three-fifths of the milk equivalent used in white families and a little over one-third of that used in Negro families. Cheese equivalent accounted for 17 per cent of milk equivalent used in white families and nearly as much in Negro families. Buttermilk, canned milk, dry milk, and ice cream made up a larger share of Negro than of white family milk budgets.

The small amount of sweetmilk consumed by Negro families was the more important difference in milk product consumption by race. Undoubtedly, some of the buttermilk, canned milk, or dry milk was used as a beverage, but it is difficult to use enough of the other milk forms to compensate for the low level of sweetmilk consumption. Distribution of total milk equivalent used, by race, is shown below:

| Milk equivalent classes | Per cent use of milk equivalent by families | |
|-------------------------|--|-------|
| | White | Negro |
| Sweetmilk..... | 59 | 38 |
| Buttermilk..... | 5 | 12 |
| All cheese..... | 17 | 15 |
| Canned milk..... | 5 | 13 |
| Dry milk..... | 6 | 10 |
| Ice cream..... | 8 | 12 |

Consumption of milk products was unevenly distributed among families in the sample. Half the white and three-fourths of the Negro families were using less than 90 per cent of the recommended equivalent. However, many white families using 50 to 89 per cent were near the upper limit, and high consumers brought the average of total equivalent used of recommended to 98 per cent. Very few classifications of white families showed groups

which were much below the optimum limits. The converse was true of the Negro families.

A third of the white and a sixth of the Negro families were using more than 110 per cent of the recommended amounts construed as optimum. The remainder used between 90 and 110 per cent of recommended amounts during the study week.

Size of family declined in both races as percentage used of recommended amounts increased. Liberal use of milk products occurred largely in families of smaller size, those composed of adults, or those in which there was no more than one child. With increases in percentage use in white families, consumption of milk equivalent and per capita milk cost per week increased by four. With increases in percentage used of recommended amounts, per capita food cost doubled and milk:food cost ratio tripled.

Previous studies by the author have shown that few families consume nutritionally adequate amounts of dairy products if less than 50 per cent is in the form of sweetmilk equivalent (1,2,3). In white families, the sweetmilk ratio declined as percentage used of recommended amounts increased, indicating greater consumption of manufactured milk forms rather than use of more sweetmilk. Data in the Negro portion of the table approximated trends in white families, Table 2.

White families using less than 90 per cent of recommended amounts were nearest the racial average in the use of sweetmilk and ice cream equivalent. With increased percentage used of recommended amounts, more sweetmilk, cheese, and ice cream were consumed. Canned and dry milk equivalent were important in the few families in the upper percentage ranges. With increase in percentage use, there was a steady decrease in the recommended amounts, indicating there were fewer persons in these families with requirements up to double those of adults.

Negro families consuming less than 50 per cent of recommended amounts used limited amounts of buttermilk, canned milk, or ice cream. Negro families that consumed optimum amounts of milk equivalent used larger amounts of canned milk and dry milk rather than sweetmilk equivalent. Families that used more than 110 per cent of recommended amounts used larger amounts of cheese, dry milk, or ice cream. Per capita use of buttermilk was much higher in each class than in the corresponding white family. In all levels of percentage use, sweetmilk

TABLE 2. PER CAPITA MILK AND FOOD COSTS PER WEEK, BY PERCENTAGE USE OF MILK EQUIVALENT, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Percentage use of milk equivalent | Family data | | Per capita data | | | | Sweet-milk ratio |
|-----------------------------------|-------------------|------|--------------------|--------------------------|--------------------------|----------------------|------------------|
| | Distri- bution | Size | Use milk equiv. | Food cost per week | Milk cost per week | Milk of food cost | |
| | | | | | | | |
| White families | | | | | | | |
| 0-49..... | 12 | 4.1 | 1.8 | 6.70 | 0.63 | 9 | 61 |
| 50-89..... | 37 | 4.1 | 3.1 | 7.21 | .99 | 14 | 64 |
| 90-109..... | 16 | 3.8 | 4.2 | 7.80 | 1.29 | 16 | 60 |
| 110-139..... | 15 | 3.6 | 5.1 | 8.26 | 1.42 | 17 | 59 |
| 140-179..... | 11 | 3.3 | 5.9 | 9.48 | 1.57 | 17 | 56 |
| 180-209..... | 3 | 3.0 | 6.9 | 10.11 | 1.90 | 19 | 56 |
| 210-249..... | 3 | 2.9 | 7.8 | 9.50 | 1.86 | 20 | 46 |
| 250 and over..... | 3 | 2.4 | 8.5 | 11.10 | 2.33 | 21 | 54 |
| Average..... | --- | 3.8 | 4.0 | 7.74 | 1.17 | 15 | 56 |
| Negro families | | | | | | | |
| 0-49..... | 46 | 4.4 | 1.4 | 3.78 | 0.41 | 11 | 36 |
| 50-89..... | 28 | 3.9 | 2.8 | 4.92 | .86 | 17 | 43 |
| 90-109..... | 8 | 3.5 | 3.9 | 6.66 | 1.06 | 16 | 31 |
| 110-139..... | 13 | 2.9 | 4.8 | 6.19 | 1.04 | 17 | 38 |
| 140-179..... | 2 | 2.0 | 4.8 | 11.25 | 1.28 | 11 | 31 |
| 180-209..... | 3 | 2.5 | 7.1 | 6.00 | 0.98 | 16 | 14 |
| Average..... | --- | 3.9 | 2.5 | 4.69 | 0.67 | 14 | 36 |

consumption was similar to white families using under 50 per cent of recommended amounts, Table 3.

PER CAPITA FOOD AND MILK COSTS

Size of family was a major variable in the use of milk products because of its relationship to income, family composition, and per capita food costs. The 1965 Household Food Consumption Survey showed that average family size in the South was 3.28 persons, about the same as for the families in the total United States sample (5).

Southern families spent less for food at home and away from home than those in the rest of the United States.

| <i>Food expenditures per week</i> | <i>United States Dol.</i> | <i>South Dol.</i> |
|-----------------------------------|-------------------------------|-----------------------|
| Family use of food | | |
| At home..... | 28.90 | 25.98 |
| Purchased meals..... | 6.11 | 5.35 |
| Total food cost..... | 35.01 | 31.33 |
| Per capita use of food | | |
| At home..... | 8.19 | 7.89 |
| Purchased meals..... | 1.86 | 1.90 |
| Total food cost..... | 10.05 | 9.79 |

TABLE 3. PER CAPITA USE OF MILK EQUIVALENT PER WEEK, BY PERCENTAGE USED OF RECOMMENDED AMOUNTS, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Percentage used of recommended amounts | Families | Per capita use of milk equivalent | | | | | | Milk equiv. used Qt. | Rec. milk equiv. Qt. |
|--|----------|-----------------------------------|--------------------|-------------------|------------------|-----------------|------------------|-------------------------|-------------------------|
| | | Sweet-milk Qt. | Butter-milk Qt. | All cheese Qt. | Can. milk Qt. | Dry milk Qt. | Ice cream Qt. | | |
| White families | | | | | | | | | |
| 0-49..... | 12 | 1.1 | 0.1 | 0.3 | 0.1 | 0.1 | 0.2 | 1.8 | 4.3 |
| 50-89..... | 37 | 2.0 | .1 | .5 | .1 | .1 | .3 | 3.1 | 4.2 |
| 90-109..... | 16 | 2.5 | .2 | .7 | .2 | .2 | .4 | 4.2 | 4.0 |
| 110-139..... | 15 | 3.0 | .2 | .9 | .2 | .4 | .4 | 5.1 | 3.9 |
| 140-179..... | 11 | 3.3 | .3 | 1.0 | .4 | .4 | .4 | 5.9 | 3.8 |
| 180-209..... | 3 | 3.9 | .3 | 1.5 | .4 | .4 | .4 | 6.9 | 3.6 |
| 210-249..... | 3 | 3.6 | .3 | 1.6 | 1.1 | .7 | .5 | 7.8 | 3.3 |
| 250 and over..... | 3 | 4.6 | .3 | 1.6 | .1 | 1.1 | .5 | 8.5 | 2.8 |
| Average..... | --- | 2.4 | 0.2 | 0.7 | 0.2 | 0.2 | 0.3 | 4.0 | 4.1 |
| Negro families | | | | | | | | | |
| 0-49..... | 46 | 0.5 | 0.2 | 0.2 | 0.2 | 0.1 | 0.2 | 1.4 | 4.5 |
| 50-89..... | 28 | 1.2 | .3 | .5 | .3 | .2 | .3 | 2.8 | 4.2 |
| 90-109..... | 8 | 1.2 | .4 | .5 | .9 | .5 | .4 | 3.9 | 3.9 |
| 110-139..... | 13 | 1.8 | .5 | 1.1 | .5 | .3 | .6 | 4.8 | 3.9 |
| 140-179..... | 2 | 1.5 | .5 | 1.1 | .2 | .9 | .6 | 4.8 | 3.3 |
| 180-209..... | 3 | 1.0 | 2.4 | .5 | .2 | 2.7 | .3 | 7.1 | 3.3 |
| Average..... | --- | 1.0 | 0.3 | 0.4 | 0.3 | 0.2 | 0.3 | 2.5 | 4.2 |

The survey also showed that Southern families divided the food dollar in much the same way as other families in the United States: 35 cents for meat, poultry, fish, and eggs; 17 cents for fruits and vegetables; 13 cents for flour, cereal, and bakery products; 13 cents for milk products; and the remainder for beverages, fats, sugar, and all other foods.

Per Capita Weekly Food Costs

The amount spent for food per person per week was the most important family attribute associated with milk product use in the 1968 survey. Typical characteristics of the families at four levels of weekly per capita food costs are shown below:

Per Capita Food Cost Less Than \$6 (234 families).

Homemaker under 35 years of age, education less than 12 years, 5 or more persons in family, annual income under \$6,000, per capita income less than \$1,800, all children under 20 years, youngest family member under 7 years, per capita meal cost less than 30 cents. Spent less than 60 cents per person, but more than 17 per cent of the food cost for dairy products.

Per Capita Food Cost \$6 to \$8 (278 families).

The "average family" in most respects when measured against the total sample. A tendency for homemakers to be 25 to 34 years of age with high school education, 4-member families, annual incomes \$6,000 to \$10,000, per capita incomes of \$1,800 to \$3,200, all children under 7 years of age, per capita meal costs 30 to 38 cents. Used 14 to 20 quarts of milk equivalent, spent 60 to 99 cents per person for dairy products, or 13 to 24 per cent of the food bill.

Per Capita Food Cost \$8 to \$11 (259 families).

White homemaker 35 to 44 years of age, 12 or more years of education, 2- to 4-member household, \$10,000 or more annual income, often adults only. Used about 20 quarts of milk equivalent, spent 40 to 52 cents per person per meal. Spent more than \$1.00 per person for dairy products, or 9 to 16 per cent of the food bill.

Per Capita Food Cost More Than \$11 Per Week (154 families).

White homemaker over 45 years of age, 2-person household, \$13,000 and over annual income, per capita income of \$3,200 and over, adults only or one teenager, per capita meal cost over 53 cents per person. Spent more than \$1.40 per person for dairy products, but less than 13 per cent of the food bill.

From the above description of the relationship of family characteristics and the purchase of milk products to per capita food expenditures, the following observations were made:

Increasing amounts were spent per person for food as:

1. Age of the homemaker increased.
2. Education of the homemaker increased.
3. Household size decreased.
4. Annual income increased.
5. Per capita income increased.
6. Age of youngest family member increased.
7. Per capita meal cost increased.

8. Larger amounts were spent for dairy products.

9. Decreased percentages of food cost were spent for milk products.

Half the white and four-fifths of the Negro families spent less than \$8 per person for food the previous 7 days. Most families spent under \$13 a person. With few exceptions as larger amounts were spent for food, family size declined. All white families were using 80 per cent or more of recommended amounts of milk equivalent, regardless of per capita food costs. Negro families spending less than \$6 per person used about half of the recommended amounts. A fourth of the Negro families, those who spent \$6 to \$8 per person per week, had used optimum amounts of milk equivalent.

Sweetmilk ratio was average or above in all white families except for a few spending more than \$16 per person. Among Negro families the sweetmilk ratio was above the racial average among those spending less than \$7, but none approached the levels of white families. As per capita food cost increased in white families, per capita milk cost regularly increased, but it was a decreasing percentage of the food bill.

In white families the use of cheese and total equivalent increased as more was spent per person per week. Highest consumers of buttermilk were in families spending more than \$13 per person per week. Highest users of canned milk were in families spending less than \$7 per person per week, Table 4.

White families that spent \$1.25 per person or more for milk products, or more than \$8 per week for food, used nutritionally adequate amounts of milk products. Negro families spending \$1 or more for dairy products, or more than \$6 for food per week, also used optimum amounts. Per capita amounts of dairy products were related to family size in Negro families. Half the Negro families had a family size of more than 4.0 persons and spent less than 60 cents per person per week for milk products.

The ratio of milk to food costs increased as greater amounts were spent for dairy products in both races. Sweetmilk ratio was above 50 per cent in all white families but in none of the Negro families. Sweetmilk ratio was more than the racial average of 36 per cent in Negro families spending 80 cents or more per person for milk products, Table 5.

With larger milk expenditures, the greatest increases in equivalent use occurred in sweetmilk in all families, cheese in white

TABLE 4. PER CAPITA FOOD COST PER WEEK, BY FAMILY SIZE AND DISTRIBUTION, USE OF MILK EQUIVALENT, SWEETMILK RATIO, MILK-FOOD COST RATIOS, AND BY RACE, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Per capita food cost per week | Distribution of families | | Family size | | Milk equiv. used of rec. | | Sweetmilk ratio | | Per capita milk cost | | Milk of food cost | |
|----------------------------------|-----------------------------|-------------|----------------|------------|-----------------------------|-------------|--------------------|-------------|-------------------------|-------------|----------------------|-------------|
| | White | Negro | White | Negro | White | Negro | White | Negro | White | Negro | White | Negro |
| <i>Dol.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>No.</i> | <i>No.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Dol.</i> | <i>Dol.</i> | <i>Pct.</i> | <i>Pct.</i> |
| Under 5.00..... | 7 | 49 | 5.0 | 5.0 | 81 | 48 | 56 | 38 | 0.91 | 0.54 | 23 | 17 |
| 5.00-5.99..... | 13 | 10 | 4.3 | 4.1 | 83 | 56 | 57 | 42 | 0.99 | 0.63 | 18 | 12 |
| 6.00-6.99..... | 16 | 17 | 4.2 | 2.9 | 96 | 80 | 56 | 44 | 1.09 | 0.95 | 17 | 15 |
| 7.00-7.99..... | 15 | 9 | 3.7 | 2.5 | 91 | 105 | 61 | 30 | 1.11 | 1.34 | 15 | 18 |
| 8.00-8.99..... | 14 | 4 | 3.9 | 2.0 | 106 | 66 | 62 | 23 | 1.22 | 0.60 | 15 | 7 |
| 9.00-10.99..... | 17 | 1 | 3.4 | 2.0 | 110 | 102 | 58 | 0 | 1.35 | 1.09 | 14 | 9 |
| 11.00-12.99..... | 12 | 8 | 2.9 | 2.3 | 122 | 111 | 58 | 38 | 1.48 | 0.90 | 13 | 9 |
| 13.00-15.99..... | 4 | 1 | 2.7 | 2.0 | 137 | 148 | 56 | 43 | 1.53 | 1.33 | 11 | 3 |
| 16.00-40.00..... | 2 | 1 | 2.5 | 3.0 | 147 | 34 | 40 | 25 | 1.69 | 0.26 | 10 | 1 |
| Average..... | --- | --- | 3.8 | 3.9 | 98 | 59 | 56 | 36 | 1.17 | 0.67 | 15 | 14 |

TABLE 5. PER CAPITA USE OF MILK EQUIVALENT, MILK AND FOOD COSTS PER WEEK, BY PER CAPITA MILK PRODUCT EXPENDITURES PER WEEK, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Per capita milk product expenditure per week | Family data | | Per capita data | | | | Sweet-milk ratio |
|--|--------------|------------|-----------------|---------------------|--------------------|-------------------|------------------|
| | Distribution | Size | Use milk equiv. | Used of rec. equiv. | Food cost per week | Milk of food cost | |
| <i>Dol.</i> | <i>Pct.</i> | <i>No.</i> | <i>Qt.</i> | <i>Pct.</i> | <i>Dol.</i> | <i>Pct.</i> | <i>Pct.</i> |
| White families | | | | | | | |
| Less than 0.50... | 4 | 3.9 | 2.3 | 59 | 6.68 | 6 | 52 |
| 0.50-0.59..... | 4 | 4.0 | 2.3 | 59 | 6.40 | 9 | 61 |
| 0.60-0.79..... | 14 | 3.9 | 2.5 | 62 | 6.81 | 10 | 52 |
| 0.80-0.99..... | 14 | 4.0 | 3.2 | 76 | 7.08 | 13 | 59 |
| 1.00-1.24..... | 20 | 3.9 | 3.7 | 67 | 7.32 | 15 | 62 |
| 1.25-1.39..... | 11 | 3.8 | 4.4 | 109 | 8.17 | 16 | 59 |
| 1.40-1.99..... | 24 | 3.5 | 5.2 | 130 | 8.97 | 18 | 58 |
| 2.00-2.39..... | 5 | 3.7 | 6.5 | 164 | 9.20 | 22 | 58 |
| 2.40-4.99..... | 4 | 2.9 | 7.7 | 201 | 11.33 | 20 | 57 |
| Average..... | --- | 3.8 | 4.0 | 98 | 7.74 | 15 | 56 |
| Negro families | | | | | | | |
| Less than 0.50 .. | 38 | 4.6 | 1.6 | 35 | 3.82 | 9 | 42 |
| 0.50-0.59..... | 12 | 4.3 | 2.2 | 53 | 4.23 | 13 | 37 |
| 0.60-0.79..... | 15 | 3.1 | 2.4 | 58 | 4.71 | 15 | 33 |
| 0.80-0.99..... | 16 | 4.0 | 3.3 | 79 | 5.46 | 16 | 42 |
| 1.00-1.24..... | 7 | 3.5 | 3.6 | 96 | 6.32 | 17 | 39 |
| 1.25-1.39..... | 5 | 2.7 | 4.7 | 124 | 7.10 | 18 | 47 |
| 1.40-1.99 ¹ | 7 | 3.1 | 5.1 | 123 | 5.88 | 23 | 45 |
| Average..... | --- | 3.9 | 2.5 | 59 | 4.69 | 14 | 36 |

¹ No family spent over \$2.00.

families, and buttermilk and ice cream in Negro families. Canned milk use was greatest in white families spending more than \$2 per person for dairy products, Table 6.

White families of 2 or 3 persons used a smaller percentage of the food bill for milk products, partly because these families had higher per capita meal costs. Two-thirds of the white families spent more than 12 per cent of the food bill for dairy products and used sufficient milk for adequate nutrition. Only those Negro families spending more than 25 per cent of the food bill for dairy products used nutritionally adequate amounts. Weekly food costs decreased by \$10 in white families with increasing milk of food costs, but there was little change in the Negro families. With greater percentages of milk to food costs, milk cost increased markedly, Table 7.

White families spending less than 12 per cent of their food dollars for dairy products used average amounts of buttermilk and ice cream, but less of the other products, and had less than optimum percentage use. Use of sweetmilk, cheese, canned milk, ice

TABLE 6. PER CAPITA USE OF MILK EQUIVALENT PER WEEK, BY PER CAPITA MILK EXPENDITURE PER WEEK, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Per capita milk expenditure per week | Families | Per capita use of milk equivalent | | | | | | Milk equiv. used | Rec. milk equiv. |
|--------------------------------------|-------------|-----------------------------------|-------------|------------|------------|------------|------------|------------------|------------------|
| | | Sweet-milk | Butter-milk | All cheese | Can. milk | Dry milk | Ice cream | | |
| | <i>Pct.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> |
| White families | | | | | | | | | |
| Less than 0.50 | 4 | 1.2 | 0.2 | 0.3 | 0.2 | 0.3 | 0.2 | 2.2 | 3.8 |
| 0.50-0.59 | 4 | 1.4 | .1 | .3 | .2 | .1 | .2 | 2.3 | 4.0 |
| 0.60-0.79 | 14 | 1.3 | .1 | .5 | .1 | .1 | .2 | 2.5 | 4.0 |
| 0.80-0.99 | 14 | 1.9 | .1 | .5 | .1 | .2 | .2 | 3.2 | 4.2 |
| 1.00-1.24 | 20 | 2.3 | .1 | .5 | .1 | .2 | .3 | 3.7 | 4.0 |
| 1.25-1.39 | 11 | 2.6 | .2 | .7 | .3 | .2 | .4 | 4.4 | 4.1 |
| 1.40-1.99 | 24 | 3.1 | .2 | .8 | .2 | .3 | .4 | 5.2 | 4.1 |
| 2.00-2.39 | 5 | 3.7 | .3 | 1.2 | .6 | .2 | .5 | 6.5 | 4.0 |
| 2.40-4.99 | 4 | 4.4 | .3 | 1.5 | .4 | .3 | .5 | 7.4 | 3.7 |
| Average | --- | 2.4 | 0.2 | 0.7 | 0.2 | 0.2 | 0.3 | 4.0 | 4.1 |
| Negro families | | | | | | | | | |
| Less than 0.50 | 38 | 0.5 | 0.1 | 0.2 | 0.3 | 0.3 | 0.1 | 1.5 | 4.4 |
| 0.50-0.59 | 12 | .8 | .4 | .6 | .1 | .1 | .3 | 2.2 | 4.2 |
| 0.60-0.79 | 15 | .8 | .4 | .4 | .1 | .4 | .3 | 2.4 | 4.0 |
| 0.80-0.99 | 16 | 1.4 | .4 | .3 | .5 | .3 | .4 | 3.3 | 4.2 |
| 1.00-1.24 | 7 | 1.4 | .5 | .7 | .2 | .1 | .4 | 3.6 | 3.7 |
| 1.25-1.39 | 5 | 2.1 | .4 | .8 | .3 | .2 | .5 | 4.3 | 3.5 |
| 1.40-1.99 ² | 7 | 2.3 | .7 | .5 | .9 | .1 | .5 | 5.0 | 4.1 |
| Average | --- | 1.0 | 0.3 | 0.4 | 0.3 | 0.2 | 0.3 | 2.5 | 4.2 |

¹ Less than 0.05 quart.

² No family spent over \$2.00.

TABLE 7. PERCENTAGE OF FOOD COST PER FAMILY PER WEEK SPENT FOR MILK PRODUCTS, BY SIZE OF FAMILY, PERCENTAGE MILK EQUIVALENT USED OF RECOMMENDED, SWEETMILK RATIO, FOOD COSTS, MILK COSTS, AND BY RACE, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Percentage of food cost per week spent for milk products | Size of family | | Milk equiv. used of rec. | | Sweetmilk ratio | | Food cost family per week | | Milk cost family per week | |
|--|----------------|------------|--------------------------|-------------|-----------------|-------------|---------------------------|-------------|---------------------------|-------------|
| | White | Negro | White | Negro | White | Negro | White | Negro | White | Negro |
| <i>Pct.</i> | <i>No.</i> | <i>No.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Dol.</i> | <i>Dol.</i> | <i>Pct.</i> | <i>Pct.</i> |
| Less than 7..... | 3.0 | 2.7 | 75 | 30 | 58 | 30 | 31.86 | 18.08 | 1.57 | 0.75 |
| 7-8..... | 3.5 | 3.9 | 66 | 40 | 50 | 22 | 31.07 | 18.94 | 2.43 | 1.42 |
| 9-12..... | 3.6 | 3.3 | 76 | 65 | 58 | 38 | 30.04 | 20.24 | 3.21 | 2.21 |
| 13-16..... | 3.8 | 4.5 | 98 | 67 | 58 | 34 | 31.23 | 20.41 | 4.54 | 3.01 |
| 17-20..... | 3.8 | 4.3 | 112 | 54 | 60 | 36 | 28.55 | 16.20 | 5.11 | 2.85 |
| 21-24..... | 4.3 | 4.9 | 115 | 59 | 58 | 39 | 28.52 | 15.88 | 6.13 | 3.55 |
| 25-30..... | 4.2 | 3.4 | 136 | 66 | 64 | 52 | 26.46 | 11.40 | 6.35 | 3.11 |
| 31-60..... | 4.1 | 4.1 | 138 | 92 | 54 | 49 | 21.61 | 17.38 | 6.96 | 5.54 |
| Average..... | 3.8 | 3.9 | 98 | 60 | 56 | 36 | 29.41 | 18.28 | 4.43 | 2.60 |

cream, and total equivalent increased in white families with larger proportions of the food dollar spent for milk products. In Negro families sweetmilk and canned milk use increased with larger milk:food cost ratios. Negro families of larger size used a greater proportion of their food money for dairy products, but did not use enough to provide nutritionally adequate amounts, Table 8.

Per Capita Meal Costs

To equalize differences in family size and expenditures, the cost of food purchased the previous week was divided by the number of meals served to all family members. Differences in actual amount needed and used by family members were not considered. Small families are more expensive to feed on a per capita basis and young children or very old people are less expensive. In previous studies, per capita meal cost was the most reliable indicator of probable dairy product use. However, the high proportion of affluent families caused per capita weekly food cost to be more important in the present study.

Larger per capita meal costs were related to greater milk expenditures in white families. The greatest per capita expenditures for milk products occurred when Negro families spent 30-34 cents per meal and 99 cents per person per week for milk products. Per capita milk costs were identical in families spending less than 20 cents or more than 70 cents, Table 9.

At each meal cost level there was a 15-cent difference between white and Negro families. Nearly a third of the Negro families spent less than 20 cents per person per meal. A third of the white families spent less than 35 cents per person, and an equal percentage spent 35 to 50 cents per person per meal. A third of the white families spent more than 50 cents per person, while equal percentages of Negro families spent more than 34 cents.

Sweetmilk ratio was about 50 per cent in all white families. The 2 per cent of the Negro families spending 50-59 cents per person per meal was the only group that used a sweetmilk ratio similar to white families. The ratio of milk to food cost declined regularly in white families, but irregularly in Negro families, Table 10.

As greater expenditures were made per person per meal in white families, the use of sweetmilk, cheese, ice cream, total milk

TABLE 8. PER CAPITA USE OF MILK EQUIVALENT PER WEEK, BY PERCENTAGE OF FOOD COST PER WEEK SPENT FOR MILK PRODUCTS, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Percentage of food cost per week spent for milk products | Families | Per capita use of milk equivalent | | | | | | Milk equiv. used | Rec. milk equiv. |
|--|-------------|-----------------------------------|-----------------|---------------|--------------|-------------|--------------|------------------------|------------------------|
| | | Sweet- milk | Butter- milk | All cheese | Can. milk | Dry milk | Ice cream | | |
| <i>Pct.</i> | <i>Pct.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> |
| White families | | | | | | | | | |
| Less than 7..... | 5 | 1.6 | 0.2 | 0.4 | 0.1 | 0.2 | 0.3 | 2.8 | 3.7 |
| 7-8..... | 7 | 1.3 | .2 | .4 | .1 | .3 | .3 | 2.6 | 3.9 |
| 9-12..... | 23 | 1.6 | .2 | .6 | .1 | .2 | .3 | 3.0 | 4.0 |
| 13-16..... | 24 | 2.3 | .2 | .6 | .1 | .3 | .3 | 4.0 | 4.0 |
| 17-20..... | 18 | 2.7 | .1 | .8 | .3 | .3 | .3 | 4.5 | 4.0 |
| 21-24..... | 10 | 2.8 | .2 | .8 | .3 | .4 | .3 | 4.8 | 4.2 |
| 25-30..... | 8 | 3.5 | .2 | .9 | .2 | .2 | .4 | 5.4 | 3.9 |
| 31-60..... | 5 | 3.1 | .2 | .9 | .6 | .3 | .5 | 5.6 | 4.0 |
| Average..... | --- | 2.4 | 0.2 | 0.7 | 0.2 | 0.2 | 0.3 | 4.0 | 4.1 |
| Negro families | | | | | | | | | |
| Less than 7..... | 10 | 0.3 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 1.0 | 3.3 |
| 7-8..... | 13 | .4 | .1 | .4 | .3 | .2 | .3 | 1.7 | 4.3 |
| 9-12..... | 24 | 1.0 | .4 | .3 | .3 | .1 | .4 | 2.5 | 3.9 |
| 13-16..... | 18 | 1.0 | .3 | .6 | .3 | .5 | .3 | 3.0 | 4.4 |
| 17-20..... | 12 | .8 | .3 | .3 | .3 | .2 | .4 | 2.3 | 4.2 |
| 21-24..... | 13 | 1.1 | .5 | .3 | .4 | .2 | .2 | 2.7 | 4.6 |
| 25-30..... | 4 | 1.4 | 2.3 | .2 | .4 | .2 | .4 | 4.9 | 4.1 |
| 31-60..... | 6 | 1.9 | .1 | .4 | 1.0 | .2 | .4 | 4.0 | 4.2 |
| Average..... | --- | 1.0 | 0.3 | 0.4 | 0.3 | 0.2 | 0.3 | 2.5 | 4.2 |

TABLE 9. PER CAPITA MEAL COSTS, BY PER CAPITA FOOD AND MILK COSTS PER WEEK AND BY RACE, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Per capita meal cost | Weekly expenditure | | | |
|----------------------|----------------------|-------------|----------------------|-------------|
| | Per capita food cost | | Per capita milk cost | |
| | White | Negro | White | Negro |
| <i>Dol.</i> | <i>Dol.</i> | <i>Dol.</i> | <i>Dol.</i> | <i>Dol.</i> |
| Less than 0.20 | 4.19 | 2.57 | 0.87 | 0.51 |
| 0.20-0.24 | 4.62 | 4.10 | 0.96 | 0.63 |
| 0.25-0.29 | 5.22 | 4.97 | 0.95 | 0.57 |
| 0.30-0.34 | 6.24 | 6.19 | 1.07 | 0.99 |
| 0.35-0.39 | 7.08 | 6.90 | 1.14 | 0.94 |
| 0.40-0.49 | 8.24 | 8.85 | 1.19 | 0.92 |
| 0.50-0.59 | 10.05 | 7.97 | 1.33 | 0.67 |
| 0.60-0.69 | 11.94 | 7.17 | 1.58 | 0.72 |
| 0.70 and over | 13.33 | 9.00 | 1.57 | 0.50 |
| Average | 7.74 | 4.69 | 1.17 | 0.67 |

equivalent, and percentage used of recommended amounts increased. Consumption of dry milk or canned milk was highest in families spending less than 30 cents per person per meal. Sweet-milk ratios were under 50 per cent. These families constituted 18 per cent of the white sample.

Cheese equivalent consumption was highest in the Negro families spending 20-25 cents, dry milk by those spending less than 25 cents, and ice cream by those spending more than 35 cents per person per meal. Percentage used of recommended amounts and total milk equivalent used were highest in Negro families spending 30 to 50 cents per person per meal, Table 11.

Annual Income

The expected pattern with increased income is a decline in family size and presence of more adults. However, more than half of the white families in the survey were from Huntsville. Their educational level, income, and family size were higher than would be expected in a typical Alabama urban sample.

The largest family size in white families was found in those with incomes higher than \$10,000, while in Negro families this occurred in those with incomes in the \$4,500-\$10,000 range.

With increase in annual income, per capita use of sweetmilk nearly tripled in white families and it doubled in Negro families. At any range except the lowest, sweetmilk use by Negro families was about half that of white families. The use of cheese equivalent in white families nearly doubled as income increased. The

TABLE 10. PER CAPITA MEAL COST, BY SIZE OF FAMILY, USE OF MILK EQUIVALENT, PERCENTAGE MILK COST WAS OF FOOD COST PER WEEK, AND BY RACE, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Per capita meal cost | Distribution of families | | Size of family | | Equiv. used of recom. | | Sweetmilk ratio | | Milk of food cost | |
|----------------------|--------------------------|-------------|----------------|------------|-----------------------|-------------|-----------------|-------------|-------------------|-------------|
| | White | Negro | White | Negro | White | Negro | White | Negro | White | Negro |
| <i>Dol.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>No.</i> | <i>No.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> |
| Less than 0.20..... | 3 | 29 | 4.8 | 5.3 | 82 | 40 | 59 | 37 | 21 | 18 |
| 0.20-0.24..... | 7 | 17 | 4.6 | 4.9 | 79 | 64 | 55 | 36 | 20 | 15 |
| 0.25-0.29..... | 8 | 10 | 4.6 | 3.5 | 84 | 67 | 54 | 39 | 18 | 12 |
| 0.30-0.34..... | 13 | 13 | 4.1 | 3.2 | 88 | 77 | 61 | 43 | 17 | 16 |
| 0.35-0.39..... | 13 | 10 | 4.0 | 2.5 | 94 | 86 | 59 | 28 | 16 | 14 |
| 0.40-0.49..... | 24 | 13 | 3.8 | 2.5 | 103 | 88 | 61 | 39 | 14 | 10 |
| 0.50-0.59..... | 15 | 2 | 3.3 | 2.3 | 113 | 93 | 57 | 58 | 13 | 8 |
| 0.60-0.69..... | 9 | 5 | 2.8 | 3.3 | 124 | 69 | 57 | 40 | 13 | 10 |
| 0.70 and over..... | 8 | 1 | 2.7 | 2.0 | 167 | 42 | 54 | 25 | 12 | 6 |
| Average..... | --- | --- | 3.8 | 3.9 | 98 | 59 | 56 | 36 | 15 | 14 |

TABLE 11. PER CAPITA USE OF MILK EQUIVALENT PER WEEK, BY PER CAPITA MEAL COST, AND BY RACE, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Per capita meal cost | Families | Per capita use of milk equivalent | | | | | | Milk equiv. used | Rec. milk equiv. | Equiv. used of rec. |
|-----------------------|------------|-----------------------------------|-------------|------------|------------|------------|------------|------------------|------------------|---------------------|
| | | Sweet-milk | Butter-milk | All cheese | Can. milk | Dry milk | Ice cream | | | |
| <i>Dol.</i> | <i>No.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Pct.</i> |
| White families | | | | | | | | | | |
| Less than 0.20..... | 24 | 2.0 | 0.1 | 0.5 | 0.3 | 0.2 | 0.2 | 3.4 | 4.2 | 82 |
| 0.20-0.24..... | 57 | 1.8 | .2 | .4 | .3 | .3 | .2 | 3.4 | 4.3 | 79 |
| 0.25-0.29..... | 64 | 1.9 | .1 | .5 | .3 | .3 | .3 | 3.4 | 4.1 | 83 |
| 0.30-0.34..... | 104 | 2.2 | .1 | .6 | .2 | .2 | .3 | 3.6 | 4.1 | 88 |
| 0.35-0.39..... | 103 | 2.3 | .2 | .7 | .2 | .1 | .2 | 3.9 | 4.2 | 93 |
| 0.40-0.49..... | 191 | 2.5 | .1 | .7 | .1 | .2 | .3 | 4.1 | 4.0 | 102 |
| 0.50-0.59..... | 119 | 2.6 | .1 | .8 | .2 | .3 | .3 | 4.5 | 4.0 | 112 |
| 0.60-0.69..... | 72 | 2.7 | .2 | .9 | .1 | .2 | .5 | 4.8 | 3.9 | 123 |
| 0.70 and over..... | 68 | 2.8 | .3 | 1.1 | .2 | .2 | .4 | 5.2 | 3.1 | 168 |
| Average..... | --- | 2.4 | 0.2 | 0.7 | 0.2 | 0.2 | 0.3 | 4.0 | 4.1 | 98 |
| Negro families | | | | | | | | | | |
| Less than 0.20..... | 36 | 0.8 | 0.2 | 0.2 | 0.4 | 0.4 | 0.2 | 2.2 | 4.7 | 47 |
| 0.20-0.24..... | 21 | 1.0 | .2 | .6 | .3 | .5 | .3 | 2.9 | 4.2 | 69 |
| 0.25-0.29..... | 13 | 1.1 | .2 | .6 | .4 | .2 | .4 | 2.9 | 4.0 | 73 |
| 0.30-0.34..... | 16 | 1.4 | .3 | .5 | .4 | .2 | .4 | 3.2 | 4.1 | 78 |
| 0.35-0.39..... | 12 | .9 | .8 | .3 | .3 | .3 | .6 | 3.2 | 3.6 | 89 |
| 0.40-0.49..... | 16 | 1.2 | .6 | .4 | .2 | .2 | .4 | 3.0 | 3.5 | 86 |
| 0.50-0.59..... | 3 | 1.3 | .1 | .0 | .4 | .0 | .5 | 2.4 | 2.4 | 100 |
| 0.60-0.69..... | 6 | .9 | .3 | .3 | .1 | .0 | .6 | 2.2 | 3.4 | 65 |
| 0.70 and over..... | 1 | .3 | .0 | .4 | .4 | .0 | .0 | 1.1 | 2.4 | 46 |
| Average..... | --- | 1.0 | 0.3 | 0.4 | 0.3 | 0.2 | 0.3 | 2.5 | 4.2 | 59 |

highest cheese use in Negro families occurred in those with incomes slightly less than the racial average of \$4,200. In white families the use of total equivalent almost doubled as income increased. There was no particular relationship of annual income to milk equivalent use in Negro families.

As income level increased, per capita weekly food costs increased by 50 per cent in white families and by almost 150 per cent in Negro families. Milk expenditures doubled in white families with increased income. Per capita milk expenditures in Negro families were never more than \$1, Table 12.

All white families except those with annual incomes less than \$1,500 were using 85 per cent or more of recommended milk equivalent and had sweetmilk ratios above 50 per cent. Negro families with incomes of \$10,000 to \$13,000 used over 110 per cent of recommended milk equivalent, had a sweetmilk ratio of 59 per cent, and spent more for food than the white families in this income range. However, the cash outlay for milk products was about three-fourths that in white families with similar incomes, Table 13.

Effect of City Size on Use of Milk Products

All families had used milk products during the study week. At least four-fifths of the 925 respondents had used some form of whole milk, such as homogenized or homogenized fortified. About half the white families used process cheese and ice cream. Over half the Negro and a third of the white families had used buttermilk and evaporated milk. A higher percentage of Negro than white families used ice milk and dry milk. Cottage cheese, skim milk, cream, and cheese were consumed by a greater percentage of white families.

Approximately the same amounts of the following products were used by families regardless of race: process cheese, ice cream, buttermilk, cottage cheese, and dry milk. Negro consumers used larger quantities per family of evaporated milk and the cured cheeses, but white families used larger amounts of whole milk, skim milk, and ice milk, Table 14.

In each city, one-third of the white and one-half of the Negro families had purchased evaporated milk. About a third of the white families had used skim milk. Ice milk was used by more families in the smaller cities, especially white families in Tuscaloosa. The Tuscaloosa sample had a greater percentage of whole

TABLE 12. PER CAPITA USE OF MILK EQUIVALENT AND FOOD COST PER WEEK, BY ANNUAL FAMILY INCOME, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Annual family income | Family | | Per capita milk equivalent used | | | | Per capita | |
|-----------------------|-------------------|------------|---------------------------------|---------------|------------|------------|--------------|--------------|
| | Distribu- tion | Size | Sweet- milk | All cheese | ME used | ME rec. | Food cost | Milk cost |
| <i>Dol.</i> | <i>Pct.</i> | <i>No.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Qt.</i> | <i>Dol.</i> | <i>Dol.</i> |
| White families | | | | | | | | |
| Less than 1,500..... | 1 | 2.5 | 0.9 | 0.5 | 2.5 | 3.7 | 6.20 | 0.74 |
| 1,500-2,999..... | 2 | 2.6 | 1.9 | .3 | 3.6 | 3.9 | 7.12 | .98 |
| 3,000-4,499..... | 7 | 3.2 | 1.9 | .4 | 3.4 | 3.8 | 6.15 | .99 |
| 4,500-5,999..... | 9 | 3.7 | 1.9 | .5 | 3.4 | 4.0 | 6.64 | 1.03 |
| 6,000-7,999..... | 15 | 3.7 | 2.2 | .6 | 4.0 | 4.0 | 6.90 | 1.11 |
| 8,000-9,999..... | 16 | 3.6 | 2.5 | .7 | 4.1 | 4.1 | 8.12 | 1.17 |
| 10,000-12,999..... | 22 | 4.0 | 2.5 | .7 | 4.1 | 4.1 | 8.11 | 1.26 |
| 13,000 and over..... | 28 | 3.9 | 2.5 | .9 | 4.4 | 4.1 | 8.82 | 1.35 |
| Average..... | --- | 3.8 | 2.4 | 0.7 | 4.0 | 4.1 | 7.74 | 1.17 |
| Negro families | | | | | | | | |
| Less than 1,500..... | 12 | 3.9 | 0.8 | 0.3 | 2.4 | 4.4 | 3.16 | 0.69 |
| 1,500-2,999..... | 24 | 3.6 | .5 | .3 | 2.0 | 4.3 | 4.40 | .54 |
| 3,000-4,499..... | 30 | 3.3 | 1.0 | .6 | 3.0 | 4.3 | 5.04 | .74 |
| 4,500-5,999..... | 15 | 4.8 | 1.0 | .2 | 2.1 | 4.3 | 4.65 | .60 |
| 6,000-7,999..... | 9 | 4.4 | .9 | .4 | 2.4 | 4.1 | 5.16 | .71 |
| 8,000-9,999..... | 8 | 4.4 | 1.3 | .4 | 3.0 | 4.0 | 5.64 | .82 |
| 10,000-12,999..... | 2 | 3.5 | 1.6 | .2 | 2.7 | 2.4 | 8.86 | .90 |
| 13,000 and over..... | 0 | --- | --- | --- | --- | --- | --- | --- |
| Average..... | --- | 3.9 | 1.0 | 0.4 | 2.5 | 4.2 | 4.69 | 0.67 |

TABLE 13. PERCENTAGE MILK EQUIVALENT USED OF RECOMMENDED AMOUNTS AND SWEETMILK RATIO, BY ANNUAL FAMILY INCOME AND BY RACE, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Annual family income | Milk equivalent used of recom. | | Sweetmilk ratio | | Negro of white use per person | |
|----------------------|--------------------------------|-------------|-----------------|-------------|-------------------------------|-------------|
| | White | Negro | White | Negro | Food | Milk |
| <i>Dol.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> |
| Less than 1,500..... | 67 | 54 | 36 | 34 | 51 | 93 |
| 1,500-2,999..... | 92 | 46 | 53 | 27 | 62 | 55 |
| 3,000-4,499..... | 89 | 70 | 56 | 34 | 82 | 75 |
| 4,500-5,999..... | 85 | 49 | 56 | 50 | 70 | 58 |
| 6,000-7,999..... | 101 | 60 | 55 | 38 | 74 | 64 |
| 8,000-9,999..... | 99 | 73 | 61 | 43 | 69 | 70 |
| 10,000-12,999..... | 99 | 116 | 61 | 59 | 109 | 71 |
| 13,000 and over..... | 108 | 0 | 57 | 0 | 0 | 0 |
| Average..... | 98 | 59 | 56 | 36 | 62 | 57 |

TABLE 14. PERCENTAGE OF TOTAL SAMPLE USING EACH MILK PRODUCT, AVERAGE QUANTITY USED DURING 7-DAY PERIOD BY CONSUMING FAMILIES, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

| Selected milk products used during 7 days previous to interview | Percentage families using | | Average quantity per family using | |
|---|---------------------------|-------------|-----------------------------------|-------------|
| | White | Negro | White | Negro |
| | <i>Pct.</i> | <i>Pct.</i> | <i>Unit</i> | <i>Unit</i> |
| Whole milk, qt..... | 88 | 83 | 8.0 | 3.8 |
| Process American cheese, oz..... | 59 | 47 | 12.2 | 11.0 |
| Ice cream, pt..... | 54 | 45 | 4.9 | 4.4 |
| Buttermilk, qt..... | 36 | 59 | 2.6 | 2.0 |
| Evaporated milk, oz..... | 34 | 53 | 33.3 | 41.8 |
| Skim milk, qt..... | 30 | 6 | 3.9 | 2.8 |
| Miscellaneous cheese, oz..... | 29 | 11 | 7.9 | 3.0 |
| Cottage cheese, pt..... | 27 | 5 | 1.6 | 1.5 |
| Cream, all forms, ½ pt..... | 24 | 2 | 1.9 | 2.4 |
| Ice milk, pt..... | 19 | 27 | 5.1 | 4.7 |
| Natural American cheese, oz..... | 18 | 7 | 11.7 | 24.1 |
| Dry milk, oz..... | 15 | 18 | 21.9 | 20.8 |
| Ice cream bars, 6/pt..... | 12 | 7 | 2.5 | .7 |
| Chocolate milk, qt..... | 10 | 8 | 2.6 | 3.3 |
| Half and half, pt..... | 7 | 0 | 1.3 | 0 |
| Condensed milk, can..... | 5 | 1 | 2.3 | 1.0 |

milk, process cheese, and buttermilk users, but the fewest consumers of ice cream, particularly in Negro families. Buttermilk was used by a greater percentage of Negro families in Tuscaloosa, but the fewest white families in Huntsville.

In Tuscaloosa dry milk consumers were more numerous in Negro families, but in Huntsville both races consumed equal amounts. Larger percentages of white families in the Huntsville sample used cottage cheese and the cured cheeses, Table 15.

TABLE 15. PERCENTAGE OF FAMILIES USING INDIVIDUAL MILK PRODUCTS DURING 7 DAYS PREVIOUS TO THE INTERVIEW, BY CITY AND BY RACE, THREE ALABAMA CITIES, SPRING 1968

| Selected milk product used during 7 days previous to interview | Percentage of families using, by city and by race | | | | | | | |
|--|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Dothan | | Tuscaloosa | | Huntsville | | All cities | |
| | White | Negro | White | Negro | White | Negro | White | Negro |
| | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> | <i>Pct.</i> |
| Whole milk..... | 62 | 70 | 97 | 91 | 92 | 82 | 88 | 83 |
| Process American cheese..... | 55 | 43 | 75 | 58 | 54 | 33 | 59 | 47 |
| Ice cream..... | 54 | 50 | 45 | 29 | 59 | 64 | 54 | 45 |
| Buttermilk..... | 43 | 43 | 50 | 73 | 29 | 51 | 36 | 59 |
| Evaporated milk..... | 34 | 53 | 35 | 53 | 34 | 54 | 34 | 53 |
| Skim milk..... | 31 | 7 | 33 | 6 | 28 | 5 | 30 | 6 |
| Miscellaneous cheese..... | 19 | 0 | 24 | 9 | 33 | 8 | 29 | 11 |
| Cottage cheese..... | 9 | 0 | 17 | 7 | 36 | 5 | 27 | 5 |
| Cream, all forms..... | 6 | 3 | 13 | 2 | 34 | 5 | 24 | 3 |
| Ice milk..... | 22 | 12 | 48 | 53 | 6 | 3 | 19 | 27 |
| Natural American cheese..... | 7 | 10 | 7 | 6 | 25 | 8 | 18 | 7 |
| Dry milk..... | 5 | 7 | 13 | 22 | 18 | 21 | 15 | 18 |
| Total families..... | 121 | 30 | 201 | 55 | 480 | 39 | 801 | 124 |
| Total people..... | 417 | 113 | 714 | 185 | 1,897 | 184 | 3,028 | 482 |
| Average size family..... | 3.4 | 3.8 | 3.5 | 3.4 | 3.9 | 4.7 | 3.8 | 3.9 |

The largest amounts of whole milk, ice cream, buttermilk, and miscellaneous cheeses were used by Huntsville white families. Largest amounts of process cheese, ice milk, and dry milk were used by Huntsville Negro families. Size of family was largest in both races in the Huntsville portion of the sample.

The largest amounts of evaporated milk and natural cheese were used in Tuscaloosa Negro families, whose per capita income was the highest in this race. Dothan white families were the largest consumers of cottage cheese.

Negro families of 4 or more persons used higher than average amounts of process cheese, ice milk, and dry milk. Tuscaloosa Negro families of larger size used the most evaporated milk but the smallest amounts of whole milk, Table 16.

In Dothan, 49 per cent of the white and 10 per cent of the Negro families had milk products delivered to the home. In Huntsville, the percentages were 45 and 15 per cent, respectively. In Tuscaloosa 63 per cent of the white and 7 per cent of the Negro families had route delivery for some products.

In the smaller cities, two-thirds of the whole milk was delivered to the home, about two-fifths of the buttermilk, and about half the skim milk. Most of the cottage cheese and heavy cream was purchased in food stores. In Tuscaloosa nearly all the skim milk was home delivered. The Huntsville families were about equally divided between the two sources in the purchase of whole and skim milk, but more than half the buttermilk, cream, and cottage cheese had come from the food store.

Consumption of whole milk per family and per person was greater in families having route delivery. Per capita use of the other products was identical by place of purchase, Table 17. It appeared that route delivery was most frequently used by the upper income homemaker who had several children and provided her family with ample milk products.

MILK PRODUCT CONSUMER PROFILES

Presentation of characteristics associated with use or nonuse of a milk product makes it possible to visualize a typical family in more than one dimension. For example, the probable purchaser of cottage cheese was the well-educated woman who had sufficient income to buy a variety of milk products such as skim milk, natural cheese, cheese spreads, or half and half. Her family often had both a high use and a high percentage use of milk equivalent.

TABLE 16. PER FAMILY USE OF INDIVIDUAL MILK PRODUCTS, BY CITY, BY SIZE FAMILY, AND BY RACE, THREE ALABAMA CITIES, SPRING 1968

| Selected milk product used during 7 days previous to interview | Per family use of milk products, by city | | | | | | | | | | | |
|--|--|------------|-------------|------------|------------|------------|-------------|------------|------------|------------|-------------|------------|
| | Dothan | | | | Tuscaloosa | | | | Huntsville | | | |
| | Amount | | Size family | | Amount | | Size family | | Amount | | Size family | |
| | White | Negro | White | Negro | White | Negro | White | Negro | White | Negro | White | Negro |
| | <i>No.</i> | <i>No.</i> | <i>No.</i> | <i>No.</i> | <i>No.</i> | <i>No.</i> | <i>No.</i> | <i>No.</i> | <i>No.</i> | <i>No.</i> | <i>No.</i> | <i>No.</i> |
| Whole milk, qt..... | 8.0 | 3.3 | 5.0 | 3.7 | 7.3 | 3.1 | 3.7 | 4.8 | 8.4 | 5.1 | 4.0 | 4.8 |
| Process American cheese, oz. | 11.3 | 8.5 | 3.6 | 3.2 | 10.6 | 9.0 | 3.7 | 5.9 | 13.0 | 18.6 | 3.8 | 5.9 |
| Ice cream, pt..... | 4.0 | 3.6 | 3.8 | 3.6 | 4.1 | 4.0 | 3.4 | 4.9 | 5.4 | 5.2 | 4.2 | 4.9 |
| Buttermilk, qt..... | 1.5 | 1.3 | 3.8 | 4.6 | 2.1 | 1.9 | 3.6 | 4.7 | 3.4 | 2.8 | 3.8 | 4.7 |
| Evaporated milk, oz..... | 22.4 | 41.0 | 3.8 | 4.4 | 22.4 | 16.3 | 3.6 | 5.1 | 37.8 | 71.9 | 4.1 | 5.1 |
| Skim milk, qt..... | 3.1 | 1.8 | 3.2 | 2.5 | 3.8 | 4.0 | 3.6 | 2.0 | 4.2 | 2.0 | 3.8 | 2.0 |
| Miscellaneous cheese, oz..... | 6.1 | 0 | 3.7 | 0 | 5.9 | 4.4 | 3.8 | 4.0 | 8.7 | 6.7 | 4.1 | 4.0 |
| Cottage cheese, pt..... | 6.8 | 0 | 3.5 | 0 | 1.0 | 1.4 | 3.4 | 4.0 | 1.3 | 1.6 | 4.3 | 4.0 |
| Cream, all forms, ½ pt..... | 1.0 | 1.5 | 4.3 | 6.0 | 1.1 | 1.0 | 3.3 | 6.5 | 1.8 | 1.0 | 4.0 | 6.5 |
| Ice milk, pt..... | 3.9 | 4.8 | 3.4 | 3.3 | 5.3 | 4.6 | 3.9 | 7.0 | 5.8 | 8.0 | 4.1 | 7.0 |
| Natural American cheese, oz. | 12.4 | 13.3 | 4.6 | 3.7 | 9.4 | 8.0 | 3.0 | 3.7 | 11.9 | 11.0 | 3.9 | 3.7 |
| Dry milk, oz..... | 10.4 | 17.0 | 3.0 | 5.5 | 19.5 | 19.3 | 3.9 | 5.8 | 23.5 | 23.9 | 4.7 | 5.8 |

TABLE 17. PER FAMILY AND PER CAPITA USE OF MILK PRODUCTS PREVIOUS 7 DAYS, BY PLACE OF PURCHASE AND BY CITY, THREE ALABAMA CITIES, SPRING 1968

| Average family size and milk product use | Place of purchase | | | | | | Average |
|--|-------------------|------------|------------|----------------|------------|------------|---------|
| | Retail store | | | Route delivery | | | |
| | Dothan | Tuscaloosa | Huntsville | Dothan | Tuscaloosa | Huntsville | |
| | No. | No. | No. | No. | No. | No. | No. |
| Whole milk | | | | | | | |
| Size family..... | 3.1 | 3.4 | 3.9 | 4.1 | 3.7 | 4.3 | 3.8 |
| Use per family, qt..... | 3.9 | 5.1 | 7.9 | 6.8 | 7.9 | 10.0 | 7.6 |
| Use per person, qt..... | 1.3 | 1.5 | 2.0 | 1.7 | 2.1 | 2.3 | 2.0 |
| Buttermilk | | | | | | | |
| Size family..... | 3.4 | 3.3 | 4.0 | 4.1 | 3.7 | 4.1 | 3.8 |
| Use per family, qt..... | 1.5 | 1.9 | 1.8 | 1.5 | 2.1 | 1.6 | 1.8 |
| Use per person, qt..... | .4 | .6 | .4 | .4 | .6 | .4 | .5 |
| Skim milk | | | | | | | |
| Size family..... | 3.0 | 3.7 | 4.0 | 3.8 | 4.0 | 4.1 | 3.9 |
| Use per family, qt..... | 2.7 | 2.8 | 4.1 | 3.3 | 3.7 | 5.1 | 3.9 |
| Use per person, qt..... | .9 | .8 | 1.0 | .9 | .9 | 1.2 | 1.0 |
| Cream, all forms | | | | | | | |
| Size family..... | 3.9 | 3.5 | 4.0 | 3.6 | 4.1 | 4.1 | 4.0 |
| Use per family, ½ pt..... | 1.6 | 1.7 | 2.1 | 2.0 | 2.0 | 2.7 | 2.0 |
| Use per person, ½ pt..... | .4 | .5 | .5 | .6 | .5 | .7 | .5 |
| Ave. size family..... | 3.5 | 3.5 | 4.0 | 3.5 | 3.5 | 4.0 | 3.8 |

Products such as whole milk, ice cream bars, and chocolate milk were most popular in families having homemakers under 40 years of age. The various cured cheeses were usually purchased in homes where the homemakers were between 25 and 45 years of age. Ice cream, cottage cheese, and cream cheese were most used in homes where the homemaker was between 30 and 55 years. Skim milk and dry milk were used by greater percentages of families in which the homemaker was above 40 years of age.

Respondents over 55 years of age used relatively more buttermilk, evaporated milk, and ice milk, but less whole milk, process cheese, ice cream, cream, chocolate milk, or whip topping. Whip topping was included in the list of dairy products to determine its competitiveness with heavy cream. Young homemakers were low users of cottage cheese, skim milk, cream, ice milk, dry milk, and the cured cheeses.

Typical Users of Individual Dairy Products

Buttermilk (359 families).

Negro homemaker, 55 years or over, adults-only family.

Evaporated milk (326 families).

Negro homemaker with less than 12 years of education, annual income less than \$6,000, per capita income less than \$1,800, per capita meal costs less than 30 cents.

Cottage cheese (243 families).

White homemaker, education beyond high school, male head support, annual income more than \$13,000, per capita income more than \$3,200, per capita meal cost more than 50 cents. High to very high use milk equivalent. Very high percentage use of milk equivalent.

Cream, whipping, sour (190 families).

White homemaker, 25 to 34 years of age, education beyond high school, male head support, annual income more than \$13,000, per capita income more than \$3,200, per capita meal cost more than 50 cents. High use of milk equivalent. High percentage use of milk equivalent.

Ice milk (197 families).

Homemaker 35 to 44 years of age, annual income between \$6,000 and \$10,000.

Natural American cheese (147 families).

White homemaker, male head support, 4-member family, annual income more than \$10,000, per capita income more than \$1,800, per capita meal costs more than 50 cents. High use of milk equivalent. High percentage use milk equivalent.

Dry milk (145 families).

Homemaker 35 to 44 years of age, 5 or more member family, youngest child 7 to 12 years old, per capita meal cost less than 30 cents. High use of milk equivalent. High percentage use of milk equivalent.

Nondairy whip topping (126 families).

White homemaker, 35 to 44 years of age, high school graduate, male head support, 4-member family, annual income more than \$13,000, per capita income more than \$3,200, youngest child 13 to 19 years old or under 7 years. High use of milk equivalent. Moderate or very high percentage use milk equivalent.

Cheese spreads, dips (112 families).

White homemaker, 25 to 34 years of age, education beyond high school, male head support, annual income more than \$13,000, per capita income more than \$3,200, youngest child under 12 years. High use of milk equivalent.

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SUMMARY

In the spring of 1968 a sample of 801 white and 124 Negro families in three Alabama cities supplied information as to yearly income, weekly food costs, and milk products used the past 7 days.

Negro families spent about the same proportion of their food dollar for milk products as white families, although they spent about two-thirds as much for food and had two-fifths the income. Measured against a recognized nutritional standard, most white families, but one-fifth of the Negro families, were using adequate amounts of milk equivalent.

More than 50 per cent of the milk products used in white families were fresh fluid forms. Negro families averaged 64 per cent of total milk consumption in processed forms such as buttermilk, dry milk, and evaporated milk. Per capita consumption of ice cream was the same in both races.

Small families usually had the greater per capita meal costs and highest milk equivalent use. Negro families with relatively high income or food costs increased consumption of manufactured milk forms rather than using more fresh milk. Negro family use of milk equivalent seldom exceeded that of the lowest income or food cost level in white families.

The beverage type milk products should be stressed in educational or promotional programs aimed at younger Negro families. For lower income families, increased use of dry milk forms might be encouraged.