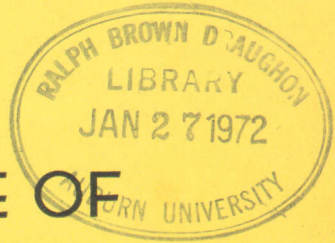
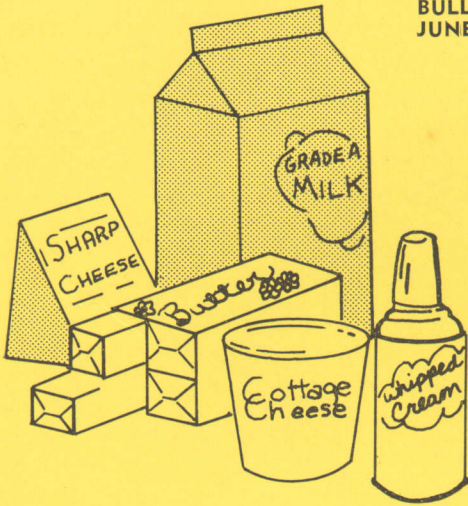
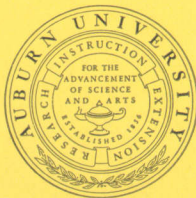


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USE OF
DAIRY
PRODUCTS
BY
ALABAMA
URBAN FAMILIES
1954, 1958, 1968



Agricultural Experiment Station
AUBURN UNIVERSITY
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SUMMARY

Between 1950 and 1970 three surveys related to consumer behavior were made of Alabama urban families in which dairy product use was a measure of purchase practices. In each study, data on purchase and use of milk products showed white and Negro families to be consistently separate universes.

Studies made in 1954, 1958, and 1968 showed that total milk equivalent consumption declined by 1 quart and sweetmilk equivalent by 0.5 quart per person per week, in both races, over the 14-year period. The decrease was most apparent in families of less than 4 persons. Small families of adults remained the largest consumers, on a per capita basis, of both total milk equivalent and manufactured products.

By 1968, per capita use of buttermilk and dry milk equivalent in white families was a third of the 1954 consumption. Use of buttermilk by Negro families in 1968 was half the amount consumed in 1954, but cheese was two-thirds and canned milk equivalent three-fourths the per capita use in the first study. However, Negro families used three times as much dry milk and ice cream in 1968 as in 1954. Consumption of ice cream by white families in 1968 was also triple the 1954 average use.

Income or money-related factors directly or indirectly influenced the kinds and amounts of dairy products used by white families.

In Negro families, low use of sweetmilk equivalent was the major reason for less than nutritionally optimum consumption of dairy products. These families used 80 per cent of the recommendation in 1954, but this had dropped to 59 per cent by 1968.

CONTENTS

	<i>Page</i>
SUMMARY.....	3
INTRODUCTION.....	5
OBJECTIVES.....	6
METHOD OF STUDY.....	6
INDIVIDUAL DAIRY PRODUCT USE.....	7
USE OF FLUID MILK FORMS.....	11
MILK EQUIVALENT – NUTRITIONAL YARDSTICK.....	13
FACTORS ASSOCIATED WITH DAIRY PRODUCT USE.....	15
Frequency of Drinking Milk – 1954.....	16
Per Capita Meal Cost.....	18
Per Capita Income.....	22
Size of Household.....	25
Family Type.....	30
Age of Homemaker.....	32
Education of Homemaker.....	34
THE PAST LEADS TO THE FUTURE.....	36
ACKNOWLEDGMENT.....	38
LITERATURE CITED.....	39

USE OF DAIRY PRODUCTS BY ALABAMA URBAN FAMILIES 1954, 1958, 1968¹

RUTH A. HAMMETT²

INTRODUCTION

CONSUMPTION OF DAIRY PRODUCTS, such as butter, whole milk, and evaporated milk, has been declining nationwide during the last 20 years (1). During this period, several of the regional studies in which the Auburn University Agricultural Experiment Station has cooperated have been concerned with factors affecting homemaker behavior in the purchase of food products.

From a historical standpoint and as a benchmark for further research in consumer attitudes and practices, this report may be of interest to those concerned with changes in food purchases. It compares findings in 1954, 1958, and 1968 projects concerned with consumer behavior.

In 1954, marketing research was directed toward increasing the consumption of a commodity. By 1958, the "why" of consumer decisions became the focus of the study. The 1968 survey attempted the testing of a sociological concept with inconclusive results. In all of these studies, milk products was the vehicle used to test actual consumer behavior.

Family and personal characteristics used in the investigations have varied during the 14-year period. Groupings by age or income have changed, but the concept remained. Race, size of household, and per capita meal cost have continued to be indi-

¹ The studies were supported by Hatch and State research appropriations. The report is based on contributing projects to the Southern Regional Food Marketing Research Projects SM-13 and SM-35. Cooperating states included Alabama, Georgia, Kentucky, Mississippi, South Carolina, Tennessee, Texas, and Virginia.

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cators of possible dairy product purchases. Interrelationships of family attributes have formed an important aspect in the analysis.

The person who writes advertising copy, the nutritionist planning an educational program, or the food editor of a newspaper needs to consider characteristics of the particular audience he wishes to reach. This report, an integrated study of consumption of milk products by Alabama urban families from 1954 to 1968, provides some measure of actual use of individual products, nutritional levels reached by age and sex groups, and attitudes toward milk as a beverage.

OBJECTIVES

The Research and Marketing Act of 1946 recognized the need for studying the processes occurring between the producer and ultimate user of a food product. It provided funds to investigate the "why" of consumer behavior within the family. The Southern Regional Food Marketing Project utilized home economics and agricultural economics personnel of the agricultural experiment stations to study homemakers in food buying situations. The interdisciplinary approach proved to be a fruitful coalition as each group broadened viewpoints in pursuing a common objective.

Sample collection, schedules, and analysis for the Alabama participating projects have been uniform over the years, with the same personnel analyzing results and writing reports. Awareness of nationwide trends in dairy product consumption and availability of data from correlated studies contributed to the following objectives:

1. To compare kinds and amounts of dairy products used in urban areas of Alabama, by race, during three periods between 1950 and 1970.
2. To analyze the effect of certain family characteristics on dairy product consumption over the 14-year period, by race.
3. To determine the family types or individuals using less than nutritionally adequate amounts of milk products.

METHOD OF STUDY

Each survey included only families of 2 or more persons who had eaten at least one meal a day in the home during the 7 days preceding the interview. Respondents were selected from residents within the city limits of inhabited places of 2,500 popula-

tion and over within Alabama. Samples of families in the 1954 study were drawn from a city directory. Census data and map checks show that such samples have good coverage of a city and the proper proportion of families by income and race.

The 1958 sample, by design, had equal numbers of white and Negro families from 45 cities in all parts of the State drawn from census data and aerial photographs. A detailed system was used in the designated blocks to secure a certain number of families within each of the four city sizes.

In the 1968 study, three cities with populations between 30,000 and 140,000 were selected. All blocks on the city maps were counted in a prescribed manner, and every 20th block was used in the samples. Suburban sprawl resulted in low counts of non-white and low income families. In addition, the largest city was not representative of Alabama in income or racial mix.

Most interviewers were full-time homemakers between 40 and 55 years of age recommended by the local home agent of the Co-operative State Extension Service. All interviewers were given 20 hours of training and closely supervised throughout the field work. Demographic details concerning the 1954 and 1958 studies were reported in earlier Agricultural Experiment Station bulletins (3,4), and the latest investigation will be reported later. Numbers of white and Negro families in each study are shown below:

<i>City and year of survey</i>	<i>White</i>	<i>Negro</i>
Anniston, 1954	378	124
Statewide, 1958	832	822
Dothan, 1968	121	30
Tuscaloosa, 1968	201	55
Huntsville, 1968	480	39
TOTAL FAMILIES	2,012	1,070

INDIVIDUAL DAIRY PRODUCT USE

Racial differences in the use of dairy products were apparent in the 1954 survey, Table 1, and continued in the later consumer behavior studies. The product list, though given in declining percentages of white family users, shows that Negro families exhibit similar declines in percentages of families using selected dairy products. The various forms of sweetmilk are listed separately, which limited their use in later comparisons.

Evaporated whole milk and American cheese were used by more than two-thirds of the families. Buttermilk was used by 19 per cent more Negro than white families, but the reverse was true

TABLE 1. PERCENTAGE OF TOTAL SAMPLE USING EACH DAIRY PRODUCT AND AVERAGE USE DURING 7-DAY PERIOD BY CONSUMING FAMILIES, 378 WHITE AND 124 NEGRO FAMILIES, ANNISTON, ALABAMA, FALL 1954

Dairy product and quantity unit	Percentage families using		Av. quantity/family using	
	White	Negro	White	Negro
	<i>Pct.</i>	<i>Pct.</i>	<i>Unit</i>	<i>Unit</i>
Evaporated whole milk, oz.....	89	78	43.1	37.9
American cheese, lb.....	77	67	.9	1.2
Buttermilk, qt.....	70	89	3.4	3.8
Homogenized whole milk, qt.....	64	42	10.2	5.1
Ice cream, pt.....	46	40	2.9	1.9
Butter, lb.....	39	46	1.0	2.3
Pasteurized whole milk, qt.....	32	35	9.2	4.7
Dry milk, oz.....	23	19	13.7	12.5
Condensed milk, oz.....	13	10	16.3	19.0
Cottage cheese, pt.....	13	8	1.1	1.3
Whipping cream, ½ pt.....	12	4	1.6	1.6
Chocolate milk, qt.....	10	9	2.2	1.7
Cream cheese, oz.....	10	4	4.7	4.2
Skim milk, qt.....	6	5	4.3	3.3
Other cheese, oz.....	5	0	8.2	0
Coffee cream, ½ pt.....	4	2	1.7	3.0
Half and half, pt.....	4	1	2.0	.5
Raw whole milk, qt.....	1	8	19.8	16.9
Evaporated skim milk, oz.....	1	2	81.1	19.2
Ice milk, pt.....	1	5	1.2	1.3

of homogenized milk. Slightly higher percentages of Negro than white families used butter, pasteurized and raw milks, evaporated skim milk, and ice milk. Negro families that used American cheese, buttermilk, butter, condensed milk, cottage cheese, coffee cream, and ice milk consumed larger amounts than the white families.

In the 1958 study, butter was omitted and skim milk included. More than half the families had used American cheese, fluid milk forms other than pasteurized whole, cottage cheese, cream cheese, cheese spreads, whipping cream, half and half, and the miscellaneous cheeses such as swiss, roquefort, or mozzarella, Table 2.

The potential market in 1958 was indicated by quantities of the various products used by consumers. Larger amounts of fluid milk forms were used by white families, but buttermilk use was about the same in both races. Negro families used larger amounts of evaporated or dry milk, and more of them purchased these products. Few Negro families used cheese spreads, miscellaneous cheeses, or coffee whiteners, but those that did used larger amounts. American cheese, cream cheese, whipping cream, and half and half products were used in about the same amount by Negro and white families, but there were few Negro users.

TABLE 2. PERCENTAGE OF TOTAL SAMPLE USING EACH DAIRY PRODUCT AND AVERAGE USE DURING 7-DAY PERIOD BY CONSUMING FAMILIES, 832 WHITE AND 822 NEGRO FAMILIES, URBAN AREAS OF ALABAMA, 1958

Dairy product and quantity unit	Percentage families using		Av. quantity/family using	
	White	Negro	White	Negro
	<i>Pct.</i>	<i>Pct.</i>	<i>Unit</i>	<i>Unit</i>
American cheese, lb.	85	72	0.8	0.9
Ice cream, pt.	67	63	3.5	3.3
Evaporated whole milk, oz.	62	82	34.7	42.0
Buttermilk, qt.	55	62	2.4	2.4
Homogenized milk, qt.	52	41	8.6	5.2
Homogenized fortified milk, qt.	32	26	9.2	5.2
Cottage cheese, pt.	29	10	1.0	.9
Dry milk, oz.	26	40	10.5	16.4
Cream cheese, oz.	14	4	5.5	5.3
Cheese spreads, oz.	12	5	5.3	5.8
Whipping cream, ½ pt.	10	3	1.5	1.6
Chocolate milk, qt.	9	7	2.3	2.0
Frozen desserts, pt.	9	8	1.8	1.4
Pasteurized whole milk, qt.	8	8	8.9	5.6
Half and half, pt.	8	2	1.0	.8
Miscellaneous cheese, oz.	8	1	4.8	6.0
Ice milk, pt.	6	6	3.2	2.5
Condensed milk, oz.	5	2	17.2	15.9
Coffee cream, pt.	5	1	2.0	1.2
Raw milk, qt.	4	4	10.3	6.3
Sour cream, pt.	3	¹	.7	.4
Pasteurized skim milk, qt.	3	1	5.3	3.0
Pasteurized fortified skim, qt.	2	1	3.7	2.2
Nondairy coffee whitener, oz.	1	1	4.4	6.0

¹ Under 1 per cent.

All fresh fluid milk forms were placed together in the 1968 study, and results show that 80 per cent or more of all families had used fresh milk in some form. About half had used process cheese and ice cream. About 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. Percentages using cottage cheese, skim milk, cream, and cheese were greater in white families.

Approximately the same amounts of process cheese, ice cream, buttermilk, cottage cheese, and dry milk were used by the 1968 sample families regardless of race. Negro consumers used larger quantities per family of evaporated milk, natural or other cheeses, and chocolate milk. White families used larger amounts of whole milk, skim milk, ice milk, ice cream bars, and half and half, Table 3.

About half as many white families used evaporated milk in 1968 as in 1954, but amounts consumed varied little between the

TABLE 3. PERCENTAGE OF TOTAL SAMPLE USING EACH DAIRY PRODUCT AND AVERAGE QUANTITY USED DURING 7-DAY PERIOD BY CONSUMING FAMILIES, 801 WHITE AND 124 NEGRO FAMILIES, THREE ALABAMA CITIES, SPRING 1968

Dairy product ¹ and quantity unit	Percentage families using		Av. quantity/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
Cottage cheese, pt.....	27	5	1.6	1.5
Skim milk, qt.....	30	6	3.9	2.8
Cream, all forms, ½ pt.....	24	2	1.9	2.4
Ice milk, pt.....	19	27	5.1	4.7
Dry milk, oz.....	15	18	21.9	20.8
Natural American cheese, oz.....	18	7	11.7	24.1
All other cheese, oz.....	29	11	7.9	3.0
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

¹ Other products used and number of families using included cream cheese (72), coffee whitener (57), condensed milk (25), infant formula (19), and yogurt (18).

TABLE 4. PERCENTAGES OF FAMILIES USING SELECTED DAIRY PRODUCTS AND QUANTITIES USED, BY RACE AND SURVEY YEAR, URBAN AREAS OF ALABAMA

Dairy product and quantity unit	Family use by race and year					
	Families using			Amount used		
	1954	1958	1968	1954	1958	1968
	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>
White families						
Evaporated milk, oz.....	80	62	34	43.1	34.7	34.1
Buttermilk, qt.....	70	55	36	3.4	2.4	2.6
Ice cream, pt.....	46	67	54	2.9	3.5	4.9
Dry milk, oz.....	23	26	15	13.7	10.5	21.9
Cottage cheese, pt.....	13	29	27	1.1	1.0	1.6
Whipping cream, ½ pt....	12	10	22	1.6	1.5	1.8
Chocolate milk, qt.....	10	9	10	2.2	2.3	2.6
Cream cheese, oz.....	10	14	8	4.7	5.5	5.3
Half and half, pt.....	4	8	7	2.0	1.0	1.3
Negro families						
Evaporated milk, oz.....	78	82	53	37.9	34.8	41.8
Buttermilk, qt.....	89	62	59	3.8	2.4	2.0
Ice cream, pt.....	40	63	45	1.9	3.3	4.4
Dry milk, oz.....	19	40	18	12.5	16.4	20.8
Cottage cheese, pt.....	8	10	5	1.3	.9	1.5
Whipping cream, ½ pt....	4	3	2	1.6	1.6	1.2
Chocolate milk, qt.....	9	7	8	1.7	2.0	3.3
Cream cheese, oz.....	4	4	3	4.2	5.3	5.0
Half and half, pt.....	1	2	0	.5	.8	0

years, Table 4. More than half the Negro families continued to use evaporated milk in 1968, and quantities used were slightly higher than in 1958. Buttermilk was used by four-fifths of all families in 1954. In 1968, however, only a third of the white and nearly two-thirds of the Negro families had used buttermilk. Amounts used by white families had dropped less than in Negro families, whose consumption was half that of the 1954 families.

Use of ice cream by both races increased consistently with each survey. Consumption per family increased by about 2 pints a week during the 14-year period. Dry milk users dropped from 23 per cent in 1958 to 15 per cent in 1968, but quantities per family increased. Families of both races used about the dry milk equivalent of 7 quarts of fresh milk per week.

Percentages of cottage cheese users stabilized at about 28 per cent in white families. Only 5 per cent of the Negro families used cottage cheese in 1968, but their per capita consumption has increased in recent years and was approximately the same as in white families. Percentages of families using chocolate milk and half and half remained about the same over the years. Quantities of chocolate milk used increased in Negro families during the period.

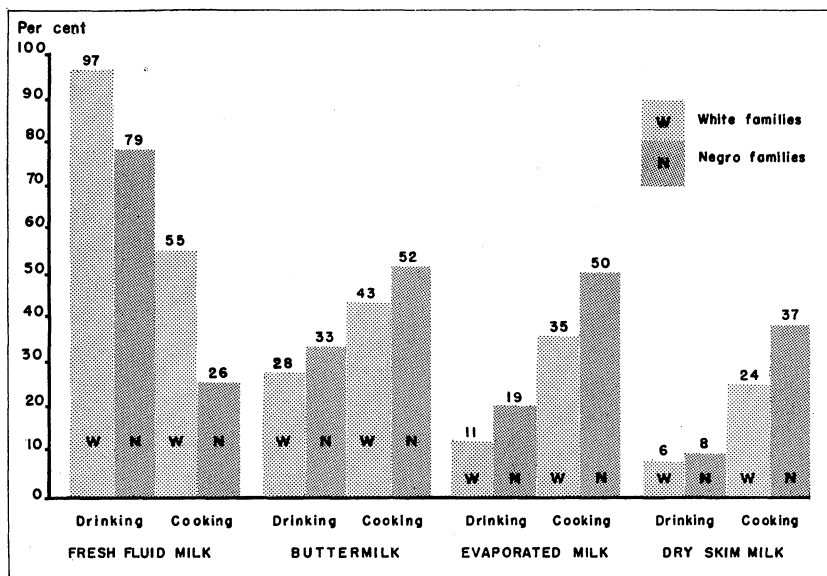
USE OF FLUID MILK FORMS

Families that use milk products for both cooking and drinking tend to use more forms and larger quantities. The declining consumption of fresh fluid milk may be the result of less home baking and other cookery uses, particularly in small families. However, consumption of dairy products tended to be low unless milk was used as a beverage for adults as well as children.

The graph taken from the 1958 study shows the wide use of fresh fluid milk for both drinking and cooking, the use of evaporated milk and dry milk for cooking purposes, and the importance of buttermilk as a beverage in families of both races.

In 1958, the use of milk forms was studied in considerable detail as to competing beverages, season, and situations such as the weight watcher's lunch and purchased meals. At meal times nearly all urban families had some beverage other than water. Race, season of the year, and age exerted considerable influence on the beverages used at snack times.

Most white children usually had an afternoon snack beverage.



Percentages of white and Negro urban Alabama families that used selected milk products for drinking and cooking during a 7-day period in 1958.

Adults were most likely to have a mid-afternoon beverage in warm weather. The beverage patterns of Negro families were similar to those of white families, except with less participation.

The general pattern of beverage choices was coffee at breakfast for adults the year around. More boys than girls drank coffee at breakfast, especially after age 16. Iced tea was the major beverage for other meals in summer. Children who drank iced tea in summer with meals usually changed to milk in winter, whereas adults were somewhat more likely to change to coffee. Soft drinks were most often used at warm weather snack times by adolescents and adults.

Milk was most often used as a beverage with the noon or evening meals, especially in cold weather. If adults drank milk at all, it was usually at these meals. Some older persons and younger children drank milk before going to bed. Milk as a snack beverage was used largely by boys of all ages and by girls under 13 years, Table 5.

At the lower income levels, a higher percentage of families used no beverage other than water. Milk, coffee, and fruit juices were used if food money was ample. Tea and soft drinks were

TABLE 5. PERCENTAGE OF MILK DRINKERS AMONG FAMILY MEMBERS AT MEAL AND SNACK PERIODS, BY RACE, URBAN AREAS OF ALABAMA, 1958

Meal and snack periods	Percentage of milk drinkers by age and sex							
	Home-maker	Male head of house	Boys			Girls		
			Under 13 yr.	13-15 yr.	16-19 yr.	Under 13 yr.	13-15 yr.	16-19 yr.
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
White families								
Breakfast.....	6	8	73	64	40	72	42	44
Noon meal.....	29	34	84	87	67	86	79	75
Evening meal.....	39	47	81	74	69	83	65	75
Morning snack.....	4	4	18	6	1	16	2	3
Afternoon snack.....	5	5	23	15	14	25	11	11
Evening snack.....	10	16	22	19	13	19	12	15
<i>Number of people</i> ¹ .	831	754	420	69	76	429	81	62
Negro families								
Breakfast.....	9	10	70	46	33	68	51	39
Noon meal.....	22	23	72	69	58	73	74	54
Evening meal.....	21	31	63	40	37	57	46	37
Morning snack.....	2	3	13	2	3	10	3	2
Afternoon snack.....	3	4	16	10	5	14	7	6
Evening snack.....	3	8	2	4	4	12	6	5
<i>Number of people</i> ² .	818	662	567	89	71	665	110	100

¹ Accounts for 93 per cent of family members; excludes 76 other males and 135 other females 20 years and over living in the family.

² Accounts for 90 per cent of family members; excludes 118 other males and 238 other females 20 years and over living in the family.

popular in families in which food money was restricted. Employed homemakers were more likely to have a snack beverage, usually coffee or a soft drink, than those who did not work outside the home.

MILK EQUIVALENT—NUTRITIONAL YARDSTICK

In the three studies, family and per capita consumption of milk products were measured by calcium equivalent in terms of quarts of sweetmilk. Milk products used by individual families were converted to milk equivalents. For example, a pound of American cheese had the protein-mineral value of 3.2 quarts of fluid whole milk.

Milk equivalents were grouped into six categories. Sweetmilk included the various whole milk types, chocolate milk, and skim milk. All forms of cheese were placed in a cheese equivalent group. Evaporated milk, condensed milk, and infant formulas were the canned milk group. Dry milk forms were the fifth group, and all frozen desserts were in the ice cream equivalent category.

In this section, all references to dairy products refer to their milk equivalent groups.

The moderate cost food plan developed by the U.S. Department of Agriculture (5,6) was the standard against which the optimum amount needed by a family was measured. The plan is one of five in which nutritional recommendations of the National Research Council are translated into food groups. Adjustments for age and sex of family members and the percentage of meals eaten at home³ fitted the recommended milk equivalent to the particular family. The per capita recommended amounts of milk equivalent in the plan, by age, for the 3 survey years follows:

Age of person	Recommended milk equivalent per week, quarts		
	1954	1958	1968
Children up to 9 years.....	5.0	6.0	5.0
Children 10 to 12 years.....	6.0	6.5	5.5
Children 13 to 19 years.....	6.5	7.0	7.0
Adults 20 years and over.....	3.5	3.5	3.5

The total milk equivalent used, when divided by the recommended amount, provided a figure called "percentage milk equivalent used of recommended." This measured the degree to which dairy products consumed fitted nutritional requirements of the particular family. The optimum range was construed to be 90 to 109 per cent of the recommended equivalent amount.

Average per capita use of the six milk equivalent groups for the 3 survey years, by race, is shown in Table 6. Over the 14-year

TABLE 6. PER CAPITA USE OF QUARTS OF MILK EQUIVALENT, BY RACE AND SURVEY YEAR, ALABAMA URBAN AREAS

Milk equivalent group	Per capita use of milk equivalent, by race and year								
	White families			Negro families			All families		
	1954	1958	1968	1954	1958	1968	1954	1958	1968
	<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>Qt.</i>
Sweetmilk.....	2.8	2.7	2.4	1.5	1.1	1.0	2.5	1.7	1.8
Buttermilk.....	.6	.4	.2	.8	.4	.3	.7	.4	.2
Cheese.....	.7	.8	.7	.6	.6	.4	.6	.7	.5
Canned milk.....	.6	.4	.2	.4	.5	.3	.5	.5	.3
Dry milk.....	.2	.4	.2	.1	.5	.3	.2	.5	.3
Ice cream.....	.1	.3	.3	.1	.2	.3	.1	.3	.3
Total.....	5.0	5.0	4.0	3.5	3.3	2.5	4.6	4.1	3.4
Recommended equivalent	4.2	4.6	4.1	4.4	4.8	4.2	4.3	4.7	4.2
<i>Per cent used of recommended equivalent.</i>	119	109	98	80	69	59	107	84	81
<i>Total families.....</i>	378	832	801	124	822	124	502	1,654	925

³ In 1968, 20 per cent of meals were eaten away from home.

period, sweetmilk equivalent use declined in both races by about 0.5 quart per person per week. In white families, buttermilk equivalent declined from 0.6 quart per person per week in 1954 to 0.2 quart in 1968. A similar decline was found among Negro families, with a drop from 0.8 quart in 1954 to 0.3 quart in 1968. Per capita use of cheese was highest in Negro families in 1958. Canned milk use by white families in 1968 was a third of the 1954 level, but the decline was less in Negro families. Dry milk consumption in both races was highest in 1958. Negro families used larger amounts of dry milk than the white families in 1968. Per capita use of ice cream in each race was three times as high in 1968 as in 1954.

Total milk equivalent used declined by 1 quart per person per week in both races from 1954 to 1968. The recommended amount was highest in 1958. The recommended amount goes up with numbers and ages of children in the family and number of meals eaten at home. In percentage milk equivalent used of recommended, there was a decline of 10 per cent in each succeeding survey year.

Comparison by race showed that in 1954 Negro families used more buttermilk than white families, about the same ice cream and cheese equivalent, two-thirds as much canned milk, and half as much sweetmilk and dry milk equivalents. In 1968 Negro families used more buttermilk, canned milk, and dry milk than white families, slightly over half as much cheese, the same amount of ice cream, and two-fifths as much sweetmilk equivalent.

FACTORS ASSOCIATED WITH DAIRY PRODUCT USE

Low use of milk and milk products is a reflection of poor dietary practices prevalent in all income groups. Overcoming this will require a concerted effort from many sources to increase awareness of the need and essentials of good nutrition. Many approaches will be needed to improve the ability and desire of family members to select and consume nutritionally adequate foods.

Marketing can improve its efficiency when consumers give more than lip service to "balanced meals," and production can be matched to food needs as well as tastes and preferences. This report attempts to identify persistent and measurable family attributes that show areas of educational need that might be met by the dairy industry or educational organizations.

The 1954 study set up 18 factors thought to be associated with varying use of individual and total dairy products. Selected as most closely related were frequency of drinking milk by the household heads, race, age and sex of family members, per capita meal cost, and socio-economic score. Family characteristics significant in white families only were annual income and age or education of household heads. Other family attributes studied included size of household, family type, sex of head of house, number of wage earners, hours of outside employment of the homemaker, and the source of principal income. Per capita income and size of household were included as descriptive characteristics, but not as major variables.

The 1958 study selected race, per capita income, per capita meal cost, size of household, education of the homemaker, and age of youngest family member as most closely related to dairy product use. Age of homemaker and family type were also associated with milk use. Other characteristics investigated included age and education of the male head, annual family income, occupation of the principal earner, employment of homemaker outside the home, total food expenditure the past 7 days, and home background of the household heads.

The 1968 study found that race, annual income, size of household, per capita meal or weekly food cost, percentage of the weekly food bill spent for milk, and age of youngest family member were indicative of probable use of dairy products.

In addition, these characteristics were analyzed: Age and education of the male head of the house and of the homemaker, social class, per capita income, and family structure. Scores for the following items were also analyzed: Adaptation to the market, integration of the family into the marketing process, goal attainment of objectives related to food purchases, and homemaker attitudes toward convenience, home centeredness, economy, and conservative-impulsive orientation.

Frequency of Drinking Milk—1954

In the 1954 study, frequency of drinking milk by the husband, the homemaker, or both was the most important family characteristic associated with amount of milk equivalent used. In both races, when household heads drank milk at every meal or every day, the percentage of recommended amounts was above both racial averages and optimum levels. Milk equivalent used by

TABLE 7. RELATIONSHIP BETWEEN FAMILY CHARACTERISTICS AND FREQUENCY OF DRINKING FRESH MILK, BY SEX OF FAMILY HEAD AND BY RACE, ANNISTON, ALABAMA, FALL 1954

Family characteristics by sex of family head	Characteristics by frequency of drinking milk and by race								Total or average	
	Every meal		Everyday		Sometimes		Never		White	Negro
	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro
	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>	<i>Unit</i>
Husband¹										
Families, no.....	42	8	197	29	77	43	24	12	340	92
Annual income, dol.....	4,044	2,109	4,139	2,499	3,706	2,272	3,123	2,446	3,818	2,028
Per capita income, dol.....	1,055	511	1,027	562	875	448	861	699	955	459
Milk equivalent used, qt.....	5.7	6.5	5.5	4.4	4.3	3.0	3.6	2.5	5.0	3.5
Recommended milk equivalent, qt.....	4.1	4.3	4.2	4.4	4.1	4.5	4.2	4.3	4.2	4.4
Per cent used of recommended amount	139	151	131	100	105	67	86	58	110	80
Homemaker²										
Families, no.....	26	11	207	41	111	46	33	24	377	122
Annual income, dol.....	4,062	1,999	4,004	2,464	3,584	1,682	3,296	1,923	3,818	2,028
Per capita income, dol.....	1,089	468	1,016	581	878	356	777	448	955	459
Milk equivalent used, qt.....	6.2	6.4	5.3	4.1	4.7	2.8	3.6	2.3	5.0	3.5
Recommended milk equivalent, qt.....	4.0	4.3	4.2	4.2	4.2	4.7	4.2	4.4	4.2	4.4
Per cent used of recommended amount	155	149	126	98	112	60	86	52	119	80

¹ Includes 340 white and 112 Negro husbands or male heads.

² Includes 378 white and 124 Negro homemakers.

white families was 6.0 quarts per person per week if both household heads drank milk at every meal. If they never drank milk it was 3.6 quarts. Recommended amount remained stable so this was not a factor. The comparable decline in Negro families was from 6.5 to 2.5 quarts, Table 7.

Household heads in white families were more likely to drink milk if annual or per capita income was above the average. In Table 7, 32 Negro families that were headed by women were omitted. In these families, annual income was \$1,097 and per capita income, \$279. This accounts for the "above average income" figures in the four Negro husband columns, and underscores the low family incomes in families headed by women.

Per Capita Meal Cost

In the 1954 report this statement was made: "In many respects the amount of cash that families were spending per individual per meal for all food was one of the better measures of the use of dairy products. When food expenditures were large enough to provide an adequate and nutritious diet, dairy products played an important part in the family food supply."

In 1958 and 1968 this factor was designated per capita meal cost, and a similar statement could still be made. In 1954 families spending above 30¢ per person per meal, and in 1968 above 35¢, were using nutritionally adequate amounts of dairy products. In 1958 it required per capita meal costs of 25¢ in white families and 30¢ in Negro families to reach optimum milk equivalent levels.

The actual money ranges in the 1954 study differ from the later studies, but the trends were similar in their relationship to milk equivalent use, Table 8. Use of sweetmilk and cheese equivalent increased with greater meal expenditures for both races. As meal cost per person increased in white families, there was an increase in use of buttermilk but a decrease in use of dry milk. In Negro families recommended amounts declined with increased meal costs, which indicated a decrease in household size and an increase in adult members.

Per capita meal cost and per capita income were found to be interrelated, Table 8. In the ranges used in these studies, small adult-only families or those with one child are characterized by higher per capita meal costs and per capita incomes. An increase

TABLE 8. PER CAPITA USE OF MILK EQUIVALENTS, BY PER CAPITA MEAL COST,
378 WHITE AND 124 NEGRO FAMILIES, ANNISTON, ALABAMA, FALL 1954

Per capita meal cost, cents	Families	Per capita use milk equivalent						Milk equiv. used	Rec. milk equiv.	Equiv. used of rec.	Per capita income
		Sweet- milk	Butter- milk	All cheese	Canned milk	Dry milk	Ice cream				
	<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>	<i>Dol.</i>
White families											
Under 10.....	5	1.7	1.7	0.8	0.2	0	0	4.4	4.3	102	281
10-19.....	42	1.9	.5	.4	.6	.4	¹	3.8	4.6	83	485
20-29.....	114	3.0	.5	.6	.6	.2	.1	5.0	4.3	116	782
30-39.....	117	3.0	.6	.6	.5	.3	.2	5.2	4.1	127	1,055
40-49.....	61	3.1	.6	.8	.5	.1	.2	5.4	4.0	135	1,374
50 and over.....	38	3.2	.8	1.1	.6	.1	.2	6.1	3.7	165	1,379
TOTAL AND AVERAGE.....	378	2.8	.6	.7	.6	.2	.1	5.0	4.2	119	955
Negro families											
Under 10.....	10	.6	.6	.3	.3	.2	¹	2.0	5.0	40	190
10-19.....	65	1.4	.8	.5	.5	.2	¹	3.4	4.5	76	404
20-29.....	29	1.7	.7	.7	.4	0	.1	3.6	4.1	88	611
30 and over.....	20	2.2	.8	.9	.5	.3	.2	4.9	4.0	122	799
TOTAL AND AVERAGE.....	124	1.5	.8	.6	.4	.1	.1	3.5	4.4	80	459

¹ Less than 0.05 unit.

TABLE 9. PER CAPITA USE OF MILK EQUIVALENT DURING 7-DAY PERIOD, BY PER CAPITA MEAL COST AND BY RACE, URBAN AREAS OF ALABAMA, 1958

Per capita meal cost, cents	Families	Per capita use milk equivalent						Milk equiv. used	Rec. milk equiv.	Equiv. used of rec.
		Sweet- milk	Butter- milk	All cheese	Canned milk	Dry milk	Ice cream			
	No.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Pct.
White families										
Under 10.....	11	1.1	0.4	0.3	0.2	0.3	0.1	2.4	5.0	48
10-19.....	99	1.7	.4	.6	.5	.5	.1	3.8	4.9	78
20-24.....	93	2.0	.4	.7	.5	.4	.2	4.2	4.7	89
25-29.....	149	2.8	.4	.8	.3	.4	.3	5.0	4.7	106
30-34.....	118	3.0	.3	.9	.3	.2	.3	5.0	4.6	109
35-39.....	120	2.9	.4	.9	.3	.4	.4	5.3	4.4	120
40-49.....	135	3.4	.5	1.2	.5	.3	.3	6.3	4.2	150
50 and over.....	105	3.9	.4	1.2	.3	.2	.4	6.5	4.2	155
TOTAL OR AVERAGE.....	830	2.7	.4	.8	.4	.4	.3	5.0	4.6	109
Negro families										
Under 10.....	63	0.4	.2	.4	.3	.7	.1	2.1	5.3	40
10-19.....	160	0.9	.4	.5	.5	.5	.1	2.9	5.0	58
20-24.....	158	1.3	.5	.6	.6	.4	.2	3.6	4.8	75
25-29.....	154	1.4	.5	.7	.5	.5	.3	3.9	4.4	89
30-34.....	119	2.0	.6	1.0	.5	.3	.3	4.7	4.1	115
35-39.....	62	1.7	.9	.9	.7	.3	.3	4.8	3.9	123
40-49.....	57	2.4	.8	1.3	.9	.3	.5	6.2	4.3	144
50 and over.....	39	2.8	.6	1.4	.6	.5	.6	6.5	3.8	171
TOTAL OR AVERAGE.....	822	1.1	.4	.6	.5	.5	.2	3.3	4.8	69

in one or the other attribute is usually accompanied by a rise in the other.

In the 1958 study, as per capita meal cost increased from lowest to highest, the use of milk equivalent tripled in both races. The percentage used of recommended equivalent tripled in white families and quadrupled in Negro families, Table 9. All families increased their use of sweetmilk, cheese, and ice cream equivalent as larger amounts were spent per person per meal. In Negro families there was also an increase in buttermilk equivalent use with increased food costs.

As per capita meal cost increased there was a decline in recommended equivalent, an indication of fewer children in families with high per capita meal costs. Cheese and sweetmilk equivalents were considered expensive foods to be used in smaller families, by the more affluent, or in families of adults only. Buttermilk and ice cream were also used in larger amounts in the high per capita meal cost families.

When equal per capita meal costs were considered for all three periods, as in Table 10, the average use of sweetmilk per person in white families doubled in the earlier surveys as larger amounts were spent for food. Inflation caused the point of "average use" to increase from about 20¢ to around 40¢ per person per meal. In Negro families, average use of sweetmilk increased in the earlier surveys with larger per capita meal costs, but this effect was not found in the 1968 sample.

As white families spent more per person per week for food, the

TABLE 10. PER CAPITA USE OF SWEETMILK EQUIVALENT, BY PER CAPITA MEAL COST, RACE, AND SURVEY YEAR, ALABAMA URBAN AREAS

Per capita meal cost, cents	Per capita use sweetmilk equivalent per week					
	White families			Negro families		
	1954	1958	1968	1954	1958	1968
	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>
Under 10.....	1.7	1.1	2.0	0.6	0.4	0.8
10-19.....	1.9	1.7	¹	1.4	.9	¹
20-24.....	3.0	2.0	1.8	1.7	1.3	1.0
25-29.....	¹	2.8	1.9	¹	1.4	1.1
30-34.....	3.0	3.0	2.2	2.2	2.0	1.4
35-39.....	¹	2.9	2.3	0	1.7	.9
40-49.....	3.1	3.4	2.5	0	2.4	1.2
50-59.....	3.2	3.9	2.6	0	2.8	1.3
60-69.....	0	0	2.7	0	0	.9
70 and over.....	0	0	2.8	0	0	.3
AVERAGE.....	2.9	2.7	2.4	1.5	1.1	1.0

¹ Included in preceding class.

TABLE 11. PER CAPITA USE OF MILK EQUIVALENT PER WEEK, BY PER CAPITA MEAL COST, SURVEY YEAR, AND BY RACE, ALABAMA URBAN AREAS

Per capita meal cost, cents	Per capita use milk equivalent per week					
	White families			Negro families		
	1954	1958	1968	1954	1958	1968
	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>
Under 10.....	4.4	2.4	3.4	2.0	2.1	2.2
10-19.....	3.8	3.8	3.1 ¹	3.4	2.9	2.9 ¹
20-24.....	5.0	4.2	3.4	3.6	3.6	2.9
25-29.....	1	5.0	3.4	1	3.9	2.9
30-34.....	5.2	5.0	3.6	4.9	4.7	3.2
35-39.....	1	5.3	3.9	0	4.8	3.2
40-49.....	5.4	6.3	4.1	0	6.2	3.0
50-59.....	6.1	6.5	4.5	0	6.5	2.4
60-69.....	0	0	4.8	0	0	2.2
70 and over.....	0	0	5.2	0	0	1.1
AVERAGE.....	5.0	5.0	4.0	3.5	3.3	2.5

¹ Included in preceding class.

use of milk equivalent increased by about 50 per cent, Table 11. In Negro families, total equivalent use more than doubled as per capita meal cost increased in earlier surveys, but there was less change in the 1968 study.

To understand the continuing relationship of per capita meal cost to dairy product use, it is important to keep in mind the characteristics of families spending the relative amounts. Diminishing household size is accompanied by added costs because of the small quantities purchased or waste from the usual packaging. Per capita income is large enough in most small families to allow for liberal food funds. Increasing family size or decreasing per capita income may actually result in lower per capita meal costs because of the presence of young children whose food needs are less, the use of low cost foods, or the opportunity to buy in economical quantities.

Per Capita Income

Per capita income was not a major variable in the 1954 study, but it became the primary indicator of the use of dairy products in 1958, Tables 7 and 12. The 1968 survey sample was an unbalanced one, having too many affluent families who had sufficient income to provide their larger families with ample food. As a result, annual income and per capita food costs were more closely related to milk equivalent use than per capita income.

However, some relationships of per capita income to sweetmilk

TABLE 12. PER CAPITA USE OF MILK EQUIVALENT DURING 7-DAY PERIOD, BY PER CAPITA INCOME AND BY RACE, URBAN AREAS OF ALABAMA, 1958

Per capita income, dollars	Families	Per capita use milk equivalent						Milk equiv. used	Rec. milk equiv.	Equiv. used of rec.
		Sweet- milk	Butter- milk	All cheese	Canned milk	Dry milk	Ice cream			
	No.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Pct.
White families										
Under 300.....	40	1.4	0.3	0.5	0.4	0.5	0.1	3.2	4.8	67
300-599.....	110	2.0	.4	.7	.4	.5	.2	4.2	4.2	100
600-899.....	137	2.5	.5	.8	.5	.4	.2	4.9	4.7	104
900-1,199.....	152	2.8	.4	.9	.5	.3	.3	5.2	4.7	111
1,200-1,799.....	193	3.2	.3	.9	.3	.3	.3	5.3	4.5	118
1,800-2,399.....	107	3.2	.4	1.0	.3	.1	.3	5.4	4.2	129
2,400 and over.....	88	3.7	.5	1.2	.3	.2	.3	6.3	3.9	162
TOTAL OR AVERAGE.....	832	2.7	.4	.8	.4	.4	.3	5.0	4.6	109
Negro families										
Under 300.....	165	0.1	.3	.5	.4	.6	.1	2.5	5.1	49
300-599.....	255	1.1	.4	.5	.5	.4	.2	3.1	5.1	61
600-899.....	217	1.2	.5	.7	.6	.4	.2	3.6	4.5	80
900-1,199.....	72	1.5	.5	.7	.5	.5	.3	4.0	4.6	87
1,200-1,799.....	90	2.1	.6	1.1	.7	.2	.4	5.1	4.1	124
1,800-2,399.....	13	2.6	.4	1.1	.8	.1	.4	5.5	3.8	145
2,400 and over.....	10	1.9	.6	1.1	.8	.6	.3	5.4	3.6	150
TOTAL OR AVERAGE.....	822	1.1	.4	.6	.5	.5	.2	3.3	4.8	69

equivalent were found, Table 13. The use of sweetmilk equivalent in white families doubled as per capita income rose. Sweetmilk use also increased in Negro families up to per capita incomes of \$2,500. However, the highest amount of sweetmilk consumption by Negro families was at the level of use by lowest per capita income white families.

The consumption of total milk equivalent in white families more than tripled in 1954 as per capita income went from lowest to highest, Table 14. In the other survey years consumption doubled with the same increase in per capita income. The "average use" of total milk equivalent in white families usually occurs at

TABLE 13. PER CAPITA USE OF SWEETMILK EQUIVALENT, BY PER CAPITA INCOME, RACE, AND SURVEY YEAR, URBAN AREAS OF ALABAMA

Per capita income, dollars	Per capita use of sweetmilk per week					
	White families			Negro families		
	1954 ¹	1958	1968	1954	1958	1968
	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>
Under 300.....	1.7	1.4	1.3	0.9	0.6	0.6
300-599.....	2.1	2.0	1.9	1.8	1.1	.7
600-899.....	2.6	2.5	1.6	1.4	1.2	.8
900-1,199.....	2.7	2.8	2.0	²	1.5	.9
1,200-1,799.....	3.3	3.2	2.2	²	2.1	1.4
1,800-2,499.....	3.4	3.2	2.4	²	2.6	1.2
2,500-3,199.....	²	3.7	2.4	²	1.9	1.2
3,200 and over.....	²	²	2.6	²	²	.9
AVERAGE.....	2.8	2.7	2.0	1.5	1.1	1.0

¹ Estimated.

² Not available.

TABLE 14. PER CAPITA USE OF MILK EQUIVALENT, BY PER CAPITA INCOME, RACE, AND SURVEY YEAR, URBAN AREAS OF ALABAMA

Per capita income, dollars	Per capita use of milk equivalent per week					
	White families			Negro families		
	1954 ¹	1958	1968	1954	1958	1968
	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>
Under 300.....	1.7	3.2	2.2	2.9	2.5	2.3
300-599.....	4.5	4.2	4.0	3.6	3.1	1.7
600-899.....	4.7	4.9	2.9	3.5	3.6	2.3
900-1,199.....	5.0	5.2	3.6	²	4.0	2.0
1,200-1,799.....	5.5	5.3	3.8	²	5.1	3.2
1,800-2,499.....	5.7	5.4	3.9	²	5.5	3.3
2,500-3,199.....	²	6.3	3.9	²	5.4	3.2
3,200 and over.....	²	²	5.0	²	²	2.8
AVERAGE.....	5.0	5.0	3.7	3.5	3.3	2.6

¹ Estimated.

² Not available or none.

about \$900 per capita income. Among Negro families, milk equivalent use increased with per capita income levels in the earlier surveys. "Average use" of milk equivalent in Negro families occurred at \$600 in 1958 and at \$1,200 in 1968, which was the racial average of income. If Negro family size averaged 4 persons, even the relatively low use of dairy products would have required annual incomes of \$4,800.

Size of Household

In these studies, "size of family" refers to people and is the usual concept of family size. "Size of household" is a calculated 21-meal-equivalent family size. It is based on total meals eaten in the home, including guest and hired help meals, during the 7 days preceding the interview, divided by 21 (the traditional number of meals per person per week).

Reference to method of calculating milk equivalent will show that recommended milk equivalent is based on size of household. Purchased meals were considered in determining nutritional requirements of each family, but on total family rather than individual home meals.

While not included in significant influences in the 1954 study, effect of size of household can be noted in Table 15. This factor affected milk equivalent used, percentage use of milk equivalent, and per capita income in white families, but not in Negro families. Relationships of household size have persisted into the later studies, especially of smaller or larger family groups.

Small families had lower recommended amounts, but used more buttermilk, cheese, and ice cream equivalents than the larger families. Negro families of all sizes used less sweetmilk equivalent than white families. Per capita income declined as size of household increased, particularly in the white families.

Families of fewer than 4 persons were the largest consumers of milk equivalent. In general, milk equivalent use decreased as meal equivalent family size increased in white families, but the trends were irregular in Negro families, Table 16. Even though slightly lower standards of recommended amounts were used in 1954 and 1968, there was a consistent drop in average percentage used of recommended amounts over the 14-year period. Smaller families were most obvious in this respect, Table 17. With some exceptions, increases in meal size of household were accompanied by proportionate decreases in use of milk equivalent recommended amounts.

TABLE 15. PER CAPITA USE OF MILK EQUIVALENT DURING 7-DAY PERIOD, BY RACE AND BY 21-MEAL EQUIVALENT SIZE OF HOUSEHOLD, 378 WHITE AND 124 NEGRO FAMILIES, ANNISTON, ALABAMA, FALL 1954

Meal size of household, by race	Families	Per capita use milk equivalent						Milk equiv. used	Rec. milk equiv.	Equiv. used of rec.	Per capita income
		Sweet- milk	Butter- milk	All cheese	Canned milk	Dry milk	Ice cream				
	No.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Pct.	Dol.
White families											
Under 2.1.....	35	2.9	0.7	1.0	0.7	0.2	0.2	5.8	3.6	161	1,916
2.1-3.0.....	116	3.0	.8	.7	.5	.3	.2	5.5	3.7	149	1,245
3.1-4.0.....	111	3.1	.6	.7	.5	.2	.2	5.3	4.1	129	1,032
4.1-5.0.....	56	2.9	.7	.7	.6	.2	.1	5.2	4.4	118	871
5.1-6.0.....	33	2.3	.4	.4	.7	.3	.1	4.2	4.4	95	591
6.1 and over.....	27	2.5	.4	.4	.7	.2	.1	4.3	4.7	91	488
Negro families											
Under 2.1.....	33	1.7	1.0	1.7	.3	.3	.1	4.1	3.6	114	652
2.1-3.0.....	23	1.5	.8	.7	.5	.1	.1	3.7	4.2	88	647
3.1-4.0.....	22	1.5	.8	.8	.5	.2	.1	3.9	4.3	91	530
4.1-5.0.....	13	1.0	.4	.4	.3	0	.1	2.2	4.7	47	369
5.1 and over.....	33	1.5	.8	.4	.5	.1	.1	3.3	4.8	69	343

¹ Less than 0.05 unit.

TABLE 16. PER CAPITA USE OF MILK EQUIVALENT DURING 7-DAY PERIOD, BY RACE AND BY 21-MEAL EQUIVALENT SIZE OF HOUSEHOLD, URBAN AREAS OF ALABAMA, 1958

Meal size of household, by race	Families	Per capita use milk equivalent						Milk equiv. used	Rec. milk equiv.	Equiv. used of rec.
		Sweet- milk	Butter- milk	All cheese	Canned milk	Dry milk	Ice cream			
	No.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Pct.
White families										
Under 2.0.....	108	3.2	0.5	1.4	0.3	0.6	0.3	6.4	3.8	168
2.0-2.9.....	265	2.9	.5	1.1	.4	.3	.3	5.6	4.1	137
3.0-3.9.....	205	2.9	.5	.8	.4	.3	.3	5.2	4.5	116
4.0-4.9.....	132	2.8	.4	.7	.4	.3	.3	4.9	4.8	102
5.0-5.9.....	75	2.4	.3	.7	.4	.3	.2	4.3	5.0	86
6.0-6.9.....	26	2.1	.2	.6	.4	.3	.2	3.8	5.2	73
7.0-7.9.....	12	2.2	.4	.6	.5	.6	.3	4.6	5.2	88
8.0 and over.....	9	1.4	.3	.6	.4	.4	.1	3.2	5.6	57
TOTAL OR AVERAGE.....	832	2.7	.4	.8	.4	.4	.3	5.0	4.6	109
Negro families										
Under 2.0.....	108	1.7	.7	1.2	.7	.5	.4	5.2	3.9	133
2.0-2.9.....	222	1.3	.7	.8	.5	.5	.3	4.1	3.9	105
3.0-3.9.....	130	1.3	.5	.7	.6	.5	.3	3.9	4.5	87
4.0-4.9.....	114	1.2	.4	.6	.5	.4	.2	3.3	4.9	67
5.0-5.9.....	98	1.1	.4	.5	.5	.3	.2	3.0	5.1	59
6.0-6.9.....	62	0.9	.4	.4	.6	.4	.1	2.8	5.3	53
7.0-7.9.....	37	0.8	.3	.5	.4	.5	.2	2.7	5.4	50
8.0 and over.....	51	0.5	.3	.4	.3	.5	.1	2.1	5.5	38
TOTAL OR AVERAGE.....	822	1.1	.4	.6	.5	.5	.2	3.3	4.8	69

TABLE 17. MILK EQUIVALENT USED OF RECOMMENDED, BY 21-MEAL EQUIVALENT SIZE OF HOUSEHOLD, BY RACE, AND BY SURVEY YEAR, URBAN AREAS OF ALABAMA

Meal equivalent size of household	Milk equivalent used of recommended					
	White families			Negro families		
	1954	1958	1968	1954	1958	1968
	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>
Under 2.0.....	161	168	137	114	133	80
2.0-2.9.....	149	137	111	88	105	85
3.0-3.9.....	129	116	103	91	87	64
4.0-4.9.....	118	102	93	47	67	51
5.0-5.9.....	95	86	90	69	59	64
6.0-6.9.....	91	73	76	¹	53	45
7.0-7.9.....	¹	88	85	¹	50	42
8.0 and over.....	¹	57	82	¹	38	33
AVERAGE.....	119	109	98	80	69	59

¹ Not available.

In percentage used of recommended amounts by smaller families, white families in 1954 and 1958 were about 50 points higher than Negro families. The difference was somewhat less in larger size families, but differences were consistent by race with increases in size of household. This indicates that less than adequate consumption of milk products was more prevalent in the larger size household, particularly in Negro families.

The effect of meal size of household on the use of sweetmilk equivalent is shown in Table 18. The average use per person declined in each succeeding survey. In 1954 and 1958, per capita use of sweetmilk equivalent by both races declined as meal size

TABLE 18. SWEETMILK EQUIVALENT USED PER PERSON PER WEEK, BY 21-MEAL EQUIVALENT SIZE OF HOUSEHOLD, BY RACE, AND BY SURVEY YEAR, URBAN AREAS OF ALABAMA

Meal equivalent size of household	Sweetmilk equivalent used per person					
	White families			Negro families		
	1954	1958	1968	1954	1958	1968
	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>
Under 2.0.....	2.9	3.2	2.3	1.7	1.7	1.0
2.0-2.9.....	3.0	2.9	2.3	1.5	1.3	.8
3.0-3.9.....	3.1	2.9	2.3	1.5	1.3	1.3
4.0-4.9.....	2.9	2.8	2.4	1.0	1.2	.9
5.0-5.9.....	2.3	2.4	2.5	1.5	1.1	.9
6.0-6.9.....	2.5	2.1	2.2	¹	.9	.6
7.0-7.9.....	¹	2.2	1.7	¹	.8	1.0
8.0 and over.....	¹	1.4	2.2	¹	.5	.7
AVERAGE.....	2.8	2.7	2.4	1.5	1.1	1.0

¹ Not available.

of household increased. By 1968, white families under 4 persons had curtailed per capita sweetmilk use by about 0.7 quart per week. The decrease was less in Negro families, except in the smallest size.

There was a decline in average use of buttermilk equivalent over the 14-year period in both races. Negro families were the larger users of buttermilk, but their use in 1968 was only half that of white families in 1954. In white families, use of buttermilk declined as size of household increased, Table 19.

Average per capita use of cheese equivalent decreased slightly over the years. The effect of increasing size of household is most evident in the earlier surveys, but above average amounts of cheese were used in families under 4 persons, except for Negro families in 1968.

Canned milk equivalent use declined in each succeeding survey, but less in Negro than in white families. In 1954 white families of 5 or more persons and Negro families of fewer than 4 persons used more than average amounts of canned milk. Instant dry milk was introduced in the late fifties, which could have influenced its use in 1958. Meal size of household was not related to dry milk use, except for a few larger white families in the 1968 study.

Ice cream equivalent was the only milk product having increased use over the years. Per capita use tripled during the 14-year period. In general, larger amounts were used in smaller

TABLE 19. BUTTERMILK EQUIVALENT USED PER PERSON PER WEEK, BY 21-MEAL EQUIVALENT SIZE OF HOUSEHOLD, BY RACE, AND BY SURVEY YEAR, URBAN AREAS OF ALABAMA

Meal equivalent size of household	Buttermilk equivalent used per person					
	White families			Negro families		
	1954	1958	1968	1954	1958	1968
	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>	<i>Qt.</i>
Under 2.0.....	0.7	0.5	0.3	1.0	0.7	0.4
2.0-2.9.....	.8	.5	.2	.8	.7	.7
3.0-3.9.....	.6	.5	.1	.8	.5	.3
4.0-4.9.....	.7	.4	.1	.4	.4	.2
5.0-5.9.....	.4	.3	.1	.8	.4	.3
6.0-6.9.....	.4	.2	.1	¹	.4	.2
7.0-7.9.....	¹	.4	¹	¹	.3	.1
8.0 and over.....	¹	.3	¹	¹	.3	0
AVERAGE.....	.6	.4	.2	.8	.4	.3

¹ Not available.

families, except for a few white families of 7 or more persons in the 1968 survey.

Family Type

Family type is useful in locating concentrations of high and low consumers of milk equivalent. Adult-only families usually have 2 or 3 members, high per capita incomes, and high per capita meal costs. They are usually composed of older persons, and are frequently made up of parent and child over 20 years of age.

The 1958 study gave the most definitive picture of the use of dairy products in which families are grouped by age of children, Table 20. The relative use of milk equivalent by the family groups is as follows:

White families

Adults only

Highest—percentage use of milk equivalent

Above average—sweetmilk, buttermilk, cheese, total milk equivalent used

Adults, all children 13 to 19 years of age

Highest—sweetmilk, buttermilk, total milk equivalent

Above average—cheese, percentage milk equivalent used of recommended

Adults, children under 20 years of age

Above average—recommended milk equivalent

Average—canned milk equivalent

Below average—sweetmilk, buttermilk, cheese, dry milk, ice cream, total milk equivalent used

Negro families

Adults only

Highest—sweetmilk, buttermilk, cheese, total milk equivalent used, percentage use milk equivalent of recommended

Above average—ice cream

Average use—canned milk

Below average—dry milk, recommended milk equivalent

Adults, all children 13 to 19 years of age

Above average—sweetmilk, buttermilk, cheese, dry milk, ice cream, milk equivalent used, percentage use milk equivalent

Average—canned milk, milk equivalent recommended

Adults, all children under 13 years of age

Above average—sweetmilk, canned milk, recommended milk equivalent

Average—buttermilk, ice cream, milk equivalent used

Below average—cheese, dry milk, percentage use milk equivalent

Adults, children under 20 years of age

Above average—recommended milk equivalent

Average—dry milk, ice cream

Below average—sweetmilk, buttermilk, cheese, canned milk, total milk equivalent used, percentage use milk equivalent

The above summary shows that families of adults or adults and teenagers were the largest per capita users of dairy products in

TABLE 20. PER CAPITA USE OF MILK EQUIVALENT DURING 7-DAY PERIOD, BY RACE AND BY FAMILY TYPE, URBAN AREAS OF ALABAMA, 1958

Family type	Families	Per capita use of milk equivalent						Milk equiv. used	Rec. milk equiv.	Equip. used of rec.
		Sweet-milk	Butter-milk	All cheese	Canned milk	Dry milk	Ice cream			
	<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										
All adults	316	2.8	0.5	1.1	0.3	0.4	0.3	5.5	3.7	149
Adults, children 13-19 years	106	2.9	.6	1.1	.4	.4	.3	5.7	4.8	119
Adults, children 12 years and under....	303	2.8	.3	.7	.4	.3	.3	4.8	4.7	102
Adults, children mixed ages.....	107	2.5	.3	.7	.4	.3	.2	4.4	5.3	85
TOTAL OR AVERAGE.....	832	2.7	.4	.8	.4	.4	.3	5.0	4.6	109
Negro families										
All adults	294	1.3	.6	.9	.5	.4	.3	4.0	3.6	111
Adults, children 13-19 years	67	1.2	.5	.8	.5	.6	.3	3.9	4.8	81
Adults, children 12 years and under....	301	1.2	.4	.5	.6	.4	.2	3.3	4.9	67
Adults, children mixed ages.....	160	.8	.3	.5	.4	.5	.2	2.7	5.5	49
TOTAL OR AVERAGE.....	822	1.1	.4	.6	.5	.5	.2	3.3	4.8	69

both white and Negro families. Lowest users were the larger size families in which age ranges of the children were spread over a number of years. Several other factors have touched on the limited use of dairy products when family size is large, per capita income is low, or per capita meal cost is not high enough for free food selection.

Age of Homemaker

Age of homemaker is a convenient yardstick, but it is a reliable indicator of dairy product use only for families having the usual pattern of interrelationships. If the family composition is husband, wife, and children, and if the family follows the pattern of expansion, stability, contraction, and return to a 2-member status at the usual ages, then age of the homemaker becomes meaningful in predicting use of milk products.

Annual income tends to rise with age of homemaker into the fifties. As children leave home, per capita income normally rises even though annual income has dropped. Family size is largest in the third decade, and per capita meal costs are at the peak when there is a teenager. Often per capita food costs are high in the shrinking family during the fourth and fifth decades of homemaker age. Food expenditures are usually most important in the family budget when homemakers are between 25 and 45 years of age. However, older homemakers may find difficulty in adjusting to smaller nutritional and health needs, as well as to the smaller size of family, after buying habits have become established.

The 1958 study provided the clearest picture of how age of homemaker relates to milk product use, Table 21. Respondents in both races followed the same general pattern, though Negro families never reached the same level of consumption as white families. Within certain classifications, Negro families used more buttermilk, canned milk, and dry milk than the families of white homemakers. Among the buttermilk users, quantities increased as the homemaker aged. Regardless of race, homemakers over 40 years used about the same amount of buttermilk equivalent.

Total milk equivalent used by the older homemakers in both races was about the same. Younger Negro homemakers used larger quantities of buttermilk than younger white homemakers. Canned milk use was largest in the youngest age range and decreased with age. Average use of canned milk was higher at all ages in the Negro families. Homemakers in both races over 40

TABLE 21. PER CAPITA USE OF MILK EQUIVALENT DURING 7-DAY PERIOD, BY RACE AND BY AGE OF HOMEMAKER, URBAN AREAS OF ALABAMA, 1958

Age of homemaker, years	Families	Per capita use milk equivalent						Milk equiv. used	Rec. milk equiv.	Equiv. used of rec.
		Sweet-milk	Butter-milk	All cheese	Canned milk	Dry milk	Ice cream			
	<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										
Under 20.....	16	2.4	0.2	0.8	0.5	0.6	0.2	4.7	6.4	73
20-29.....	154	2.8	.3	.7	.5	.3	.2	4.8	4.6	104
30-39.....	215	2.8	.3	.8	.4	.3	.3	4.9	4.9	100
40-49.....	183	2.8	.5	.9	.4	.4	.3	5.3	4.7	113
50-59.....	128	2.5	.5	1.1	.3	.5	.3	5.2	4.1	127
60 and over.....	132	2.5	.5	1.0	.3	.5	.3	5.2	3.8	137
TOTAL OR AVERAGE.....	828	2.7	.4	.8	.4	.4	.3	5.0	4.6	109
Negro families										
Under 20.....	15	1.1	.4	.4	.6	.3	.3	3.1	5.7	54
20-29.....	138	1.2	.4	.5	.5	.4	.2	3.3	5.0	66
30-39.....	219	1.0	.4	.6	.5	.5	.2	3.2	5.1	63
40-49.....	191	1.1	.5	.6	.5	.4	.2	3.3	4.9	67
50-59.....	129	1.1	.5	.7	.5	.5	.2	3.5	4.4	80
60 and over.....	125	0.9	.6	.6	.4	.5	.2	3.2	4.0	80
TOTAL OR AVERAGE.....	817	1.1	.4	.6	.5	.5	.2	3.3	4.8	69

years of age used dry milk in about the same amount. Younger women, especially Negro homemakers, were the lowest users of dry milk. Ice cream use was highest in Negro families with younger homemakers, but among the older ages in white families.

Total milk equivalent consumption in white families was about 0.6 quart higher if homemakers were past 40, but there was no particular relationship of use to age in Negro families. Percentage used of recommended amount was over 100 per cent in the older white families, and it was above the racial average in Negro families. This resulted in part from lesser requirements in the all-adult families typical of those in which homemakers were over 50 years of age. Above average amounts of buttermilk, cheese, and dry milk contributed to high total milk equivalents used in older families.

Education of Homemaker

Like age of the homemaker, her education was an indicator of probable dairy product use when it represented other characteristics as well. Greater education, unless accompanied by expansion of income, does not necessarily result in purchase of larger amounts of dairy products. In the ranges used in the studies, women tended to marry men with similar educational levels. Older homemakers usually had less education and smaller incomes. About 10 per cent of the white and 20 per cent of the Negro families were headed by women. Their labor rewards were generally less than in families headed by men, or their income was wholly or in part from nonwork sources.

The 1958 study provided the most comprehensive view of the relationship of education of homemaker to dairy product use, Table 22. Reaction in both races was identical, if the racial average was the criterion. Use of sweetmilk increased by 2.1 quarts in white families up to college graduate level. With a homemaker more highly educated, family consumption dropped by 0.5 quart, but their use was still above that of families whose homemaker was a high school graduate. Among the more affluent or highly educated, influences other than income apparently are more closely related to dairy product use. More research is needed in use of food in high income families.

Use of total milk equivalent increased to the college level and then declined slightly. However, Negro families showed a steady increase in total equivalent use with more years of education of

TABLE 22. PER CAPITA USE OF MILK EQUIVALENT DURING 7-DAY PERIOD, BY RACE AND BY EDUCATION OF HOMEMAKER, URBAN AREAS OF ALABAMA, 1958

Education of homemaker	Families	Per capita use milk equivalent						Milk equiv. used	Rec. milk equiv.	Equiv. used of rec.
		Sweet-milk	Butter-milk	All cheese	Canned milk	Dry milk	Ice cream			
	No.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Qt.	Pct.
White families										
Under 5 grades	26	1.5	0.5	0.5	0.5	0.6	0.2	3.8	4.3	88
5-8 grades	187	2.2	.5	.7	.4	.5	.2	4.5	4.7	96
9-11 grades	181	2.6	.5	.9	.4	.4	.3	5.1	4.6	111
High school graduate	254	2.9	.4	.9	.4	.4	.3	5.2	4.6	113
Some college	95	3.8	.3	1.0	.2	.2	.3	5.9	4.5	131
College graduate	70	3.1	.3	1.0	.2	.2	.4	5.4	4.3	126
TOTAL OR AVERAGE	813	2.7	.4	.8	.4	.4	.3	5.0	4.6	109
Negro families										
Under 5 grades	132	.8	.5	.6	.4	.6	.1	3.0	4.6	65
5-8 grades	340	.9	.4	.6	.5	.5	.2	3.1	4.9	63
9-11 grades	175	1.2	.5	.6	.5	.4	.2	3.4	5.0	68
High school graduate	99	1.5	.4	.6	.6	.4	.3	3.8	4.8	79
Some college	22	2.0	.3	.7	.7	.2	.3	4.2	4.9	86
College graduate	29	1.9	.3	.8	.7	.3	.3	4.3	4.3	100
TOTAL OR AVERAGE	797	1.1	.4	.6	.5	.5	.2	3.3	4.8	69

the homemaker, one of the few instances of a regular rate of increase in Negro families.

Buttermilk and dry milk consumption decreased with more years of education of the homemaker. Canned milk use decreased among the better educated homemaker white families, but increased in Negro families. Cheese and ice cream use increased with greater education of the homemaker. Largest amounts of recommended milk equivalent were found in the grade school educated white homemaker families, and in the "some high school" educated Negro homemaker families. The last column in the table is the most important. White families, regardless of homemaker education, were using near optimum amounts of milk equivalent. Families of college educated Negro homemakers were using milk equivalent at the level of grade school educated white homemaker families.

THE PAST LEADS TO THE FUTURE

The author's interest in factors influencing consumption of milk products to a large extent was based on a bulletin by Dr. Marguerite C. Burk (1) in which she said: "Declining consumption of dairy products (except low-fat milk, cheese, and frozen milk desserts) is characteristic of the last 20 years. Although the fluid milk market has in its favor the high proportion of young children in its population, increased income, and subsidized consumption, on the minus side, price increases, a high proportion of nonwhite population, and changes in tastes and preferences, more than offset the positive factors."

Dr. Burk's analysis of cross section data "revealed a general lowering of rates of consumption for fluid whole milk, canned milk and butter in relation to the level of real income. Higher incomes encouraged cheese and ice cream consumption. High income families decreased dairy product purchases more than moderate income families. Age composition was the key factor in most purchases. Younger families used more fluid milk and older families more fluid cream, butter, and cheese" (1,2).

The above excerpts from Dr. Burk's findings paralleled those of the Alabama white families, and provided the impetus for re-examination of data by race to determine how the passage of time had affected use of the major dairy products. It was apparent even before the 1954 study that white and Negro families constituted separate universes in their use of dairy products.

The second finding that emerged was that none of the tests used had located the motivation in Negro families to curtail dairy product use when income was ample. Equalization of income or meal cost with white families did not result in equal use of milk equivalents. However, most analyses showed irregular trends similar to those in white families.

The third persistent finding was the low quantities of sweet-milk equivalent used in Negro families, which was the major difference between low and adequate use of milk products. Butter-milk and the manufactured forms were often used in equal or greater amounts than in white families. Relatively few Negro families use sweetmilk as a beverage, and use of the other forms for drinking did not compensate for the lack of fresh milk consumption. Manufactured forms like dry or canned milk were used more for cooking than for drinking, and the popularity of butter-milk as a beverage is probably on the decline. However, there were a few larger size families that had used canned or dry milk in sufficient quantities to indicate that these families were aware that less expensive milk forms could provide good nutrition.

The fourth finding emphasized the effect of income on dairy product purchases. Money-related characteristics, such as per capita meal cost or per capita income, were the better indicators of probable dairy product use by white families. Characteristics such as age or education of the homemaker, family type, or size of household also relate to income level, and are translated into income available for limited or liberal use of food money.

The fifth finding is the persistent higher use by small, all-adult families, and the low use of milk products by the families of larger size. These families usually contained a number of children with a rather wide range of ages, and income was frequently so low that use of sweetmilk equivalent was limited to cooking purposes only.

The 1958 study provided the most complete schedule, random sample, wide coverage, and extensive analysis of the three studies. A replication of the survey with suitable additions or deletions, and using modern statistical methods, would add much to knowledge of the consumer factors affecting dairy product use. Changing social customs, hopefully more interest in food for nutrition's sake, downgrading of the importance of milk for children, the cholesterol controversy, convenience foods, or the decline of the three-meal-a-day concept may have altered these findings.

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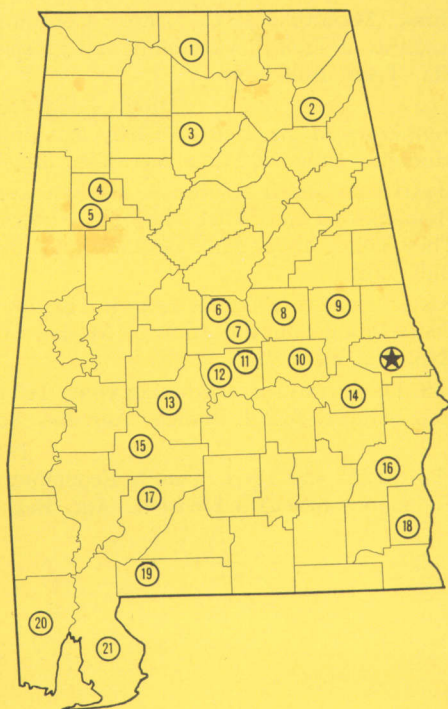
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LITERATURE CITED

- (1) BURK, MARGUERITE C. 1969. Consumption of Dairy Products and Analysis of Trends, Variability and Prospects. Univ. of Minn. Agr. Exp. Sta. Tech. Bull. 268.
- (2) ----- 1969. Food Expenditures by Upper Income Families – An Analysis of Their Changing Importance in the U.S. Food Markets. Univ. of Minn. Agr. Exp. Sta. Tech. Bull. 269.
- (3) HAMMETT, RUTH A. AND J. H. BLACKSTONE. 1964. Alabama Urban Homemakers and What They Know About, How They Use, and What They Think About Milk Products. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 352.
- (4) JONES, CLAIRE FRAZIER AND J. HOMER BLACKSTONE. 1957. Use of Dairy Products in the Anniston Market Area. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 307.
- (5) U.S. DEPARTMENT OF AGRICULTURE. 1954. Rural Family Living. Home Economics Research Branch. Agr. Res. Ser. USDA. March issue. P. 10.
- (6) ----- 1957 and 1964. Family Food Plans, 1957 and 1964. Family Economics Review. Consumer and Food Economics Research Division. Agr. Res. Ser. USDA. October issues.

AGRICULTURAL EXPERIMENT STATION SYSTEM OF ALABAMA'S LAND-GRANT UNIVERSITY

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5. Forestry Unit, Fayette County.
6. Thorsby Foundation Seed Stocks Farm, Thorsby.
7. Chilton Area Horticulture Substation, Clanton.
8. Forestry Unit, Coosa County.
9. Piedmont Substation, Camp Hill.
10. Plant Breeding Unit, Tallassee.
11. Forestry Unit, Autauga County.
12. Prattville Experiment Field, Prattville.
13. Black Belt Substation, Marion Junction.
14. Tuskegee Experiment Field, Tuskegee.
15. Lower Coastal Plain Substation, Camden.
16. Forestry Unit, Barbour County.
17. Monroeville Experiment Field, Monroeville.
18. Wiregrass Substation, Headland.
19. Brewton Experiment Field, Brewton.
20. Ornamental Horticulture Field Station, Spring Hill
21. Gulf Coast Substation, Fairhope.