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Contributions of Nonalcoholic Beverages to the U.S. Diet

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Abstract

This report analyzes consumer demand and nutritional issues associated with nonalcoholic beverages purchased for at-home use by looking at demographic variables such as household size, household income, education level, and region. The beverages include milk, carbonated soft drinks, bottled water, fruit juices, fruit drinks, coffee, tea, and isotonics (sports drinks). The report's focus is on the impact of nutritional quality from beverage purchase choices that a household makes, looking at the household's availability of calories, calcium, vitamin C, and caffeine from these beverage choices. Using the Daily Values on the Nutrition Facts portion of the food label as a reference, we find that nonalcoholic beverages purchased for at-home consumption provided, on a per-person basis:

- 10 percent of daily value for calories.
- 20 percent of the daily value for calcium.
- 70 percent of daily value for vitamin C.

Statistical analyses included the use of descriptive cross-tabulations and regression analyses, with profiles of households that were more or less likely to purchase the beverages, as well as key determinants associated with the probability of purchasing selected beverages.

Keywords: nonalcoholic beverages, nutrient intake, cross-tabulations, regression analyses, probit analyses

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Contents

Summary

Obesity is the most urgent nutrition-related health problem in America today, so the potential calorie and nutrient contribution of beverages to that increase in overweight and obesity is important to consider. Consumers are offered an ever-increasing number of choices among nonalcoholic beverages, and there is a trend toward decreased consumption of milk and increased consumption of other beverages, especially soft drinks and bottled water. Beverage choices may have important implications for intake of calories and therefore for obesity risk, as well as for adequacy of important nutrients such as calcium. The focus of this report is the nutrient availability from nonalcoholic beverages purchased for at-home consumption. Analyses are based on the 1999 ACNielsen Homescan data from 7,195 household panelists, who were nationally representative of all U.S. household level purchases.

Understanding beverage choices of households has policy significance for the U.S. Department of Agriculture (USDA) because it is the lead Federal agency that provides nutrition information to the public. Through the Food Guide Pyramid, the Dietary Guidelines for Americans, and related materials, USDA provides consumers with information on food and beverage choices that contribute to a healthful diet. Current USDA dietary guidance publications include advice on beverages. For example, the Food Guide Pyramid for Children recommends two servings from the milk group daily and includes a picture of a soft drink in the tip of the Pyramid, indicating that soft drinks should be consumed only occasionally.

USDA provided food assistance and nutrition benefits to one out of five Americans at a cost of $41.6 billion in fiscal year 2003. The largest of these programs, the Food Stamp Program, allows consumers to make their own food purchase choices, while also attempting to educate low-income households to use their food assistance benefits to make wise food choices. Other programs, such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the Child and Adult Care Food Program (CACFP), and the School Meals Programs mandate certain choices. School Meal Program regulations require that soft drinks not be served while USDA-subsidized meals are served, and WIC vouchers are valid only for certain food purchases, with milk and vitamin C-rich fruit juices the only allowable beverage choices. The Child Nutrition Programs (CACFP, School Meal Programs, and Summer Food Service Program) require that the meals and snacks subsidized through these programs follow a nutritious pattern; fruit juice is a reimbursable item choice and milk is a required meal element.

Concerns have been raised that the trend of decreased milk consumption may contribute to excess calorie consumption and declining intakes of important nutrients such as calcium, especially for youths. Most Americans still eat many of their meals at home, but food prepared away from home—i.e., restaurant, fast-food, and take-out foods—plays a much more important role in today's diet than in previous decades. Given this shift, it is useful to consider how the beverage choices selected for at-home consumption may influence the beverage choices made by consumers when they are away from home.

Our findings demonstrate that household beverage choice can have an important impact on the nutritional quality of the household food supply. The beverage choices a household makes have important effects on household calories, an important consideration given America's current obesity problem. Beverage choices also have an impact on calcium availability in the home food supply. Our analysis indicates more households purchased soft drinks than milk.

A descriptive analysis of the annual purchases (in gallons), annual expenditure (in dollars), and prices (dollars per gallon) is part of this report. Cross-tabulations were used to examine the relationship between demographic variables and nonalcoholic beverages. The list of demographics analyzed included: household income (above or below 130 percent of the poverty threshold, the eligibility level for the Food Stamp Program); household size; age, employment status, and education of the female head of household; race; region; ethnicity (Hispanic origin); and seasonality. The probit analyses featured ready-to-drink fruit juices (not frozen); ready-to-drink fruit drinks; isotonics; powdered soft drinks; tea; coffee; carbonated soft drinks; bottled water; and flavored and unflavored milk. Probit analyses for selected nonalcoholic beverages were conducted to determine the drivers associated with the decision to purchase the respective products. Cross-tabulations also were done to examine the average caloric, calcium, vitamin C, and caffeine available intake for all nonalcoholic beverages by demographic category. And, finally, regression analyses of daily nutrient intakes of calories, calcium, vitamin C, and caffeine were conducted. The purpose was to understand the key demographic factors associated with daily nutrient availability from nonalcoholic beverages.

Employment status of the household head, education of the household head, race, region, and the presence of children were statistically important in the determination of daily calories available per person. Available calcium intakes derived from nonalcoholic beverages were lower by 21 milligrams (mg) for households below the 130 percent of poverty threshold (table 1).

Table 1—Summary of nutrients available per person per day from the consumption of all nonalcoholic beverages, 1999

Demographic factor	Calories (kcal)	Calcium (mg[1])	Vitamin C (mg)	Caffeine (mg)
All persons	194.60	196.16	41.42	87.68
> 130% poverty	194.29	197.39	41.77	87.47
< 130% poverty	199.58	176.47	35.89	91.12
Region				
East	187.33	183.54	45.49	95.56
Central	208.75	217.80	39.81	91.31
South	197.94	187.34	42.99	83.36
West	178.33	196.75	36.64	82.48
Race				
White	196.22	210.90	39.70	94.55
Black	190.99	107.43	55.65	51.30
Asian	135.83	133.77	36.99	42.37
Other	190.38	146.77	42.37	60.07

[1] mg = milligrams.
Source: ERS analysis of ACNielsen Homescan data.

Available calcium intakes also were lower by 95 mg for Blacks, relative to Whites, and they were lower by 61 mg for Asians in comparison with Whites. Education of the household head, race, region, and income were the key drivers associated with daily availability of vitamin C derived from nonalcoholic beverages. Available vitamin C intakes, on a daily basis, were 6 mg lower for households below the 130 percent of poverty threshold compared with households above the 130 percent of poverty threshold. Age of the household manager, race, and region were the primary determinants of daily caffeine intake per person. For example, caffeine availability per person per day was lower by 37 mg, 33 mg, and 19 mg for Blacks, Asians, and Other races, respectively, compared with Whites. For households located in the Central region, the South and the West, available caffeine intakes were lower by 8 mg, 11 mg, and 17 mg, respectively, relative to households located in the East.

To provide perspective on the contribution of nonalcoholic beverages to nutrient intake, this study found that on average, 10 percent of the Nutrition Label standard of 2,000 calories came from at-home purchases of nonalcoholic beverages, about 20 percent of the recommended daily intake of calcium came from at-home purchases of nonalcoholic beverages, and close to 70 percent of the recommended daily intake of vitamin C came from nonalcoholic beverages. On average, the daily available intake of caffeine from nonalcoholic beverages was equivalent to almost two 12-ounce cans of Coca-Cola or roughly, one 15-ounce glass of tea.

The probit analysis indicated that race and region were key demographics associated with the decision to purchase nonalcoholic beverages. Also, household size, age of the household head, and poverty status of the household head were statistically important determinants in the decision to buy nonalcoholic beverages.

Introduction

With so many different types of nonalcoholic beverages from which to choose, what do Americans actually consume? The average American consumed 50 gallons of carbonated soft drinks in 1999, followed by 25 gallons of coffee, 23 gallons of milk, 16 gallons of bottled water, 16 gallons of fruit juices and drinks, and 8 gallons of tea, according to Economic Research Service (ERS) food supply data, which includes at-home and away-from-home beverage intake (fig. 1). Almost all fruit juices were consumed at home (82.3 percent), while most soft drink (60.2 percent) and bottled water (69.1 percent) choices were consumed away from home (fig. 2).

The nonalcoholic beverage industry is very competitive, with hundreds of new products introduced annually. In 1999, the industry spent $165.6 million in magazine advertising and $355 million on network television advertising (Statistical Abstract of the United States: 2000). These advertising expenditures are lower bounds because these figures do not include the dairy industry's advertising expenses.

With all of the competing products in this segment, substitution effects are dominant. A study in 1999 revealed that soft drinks had displaced milk and fruit juice (Harnack et al., 1999). The knowledge of such effects is important in order to be able to understand trends and to monitor the changing environment of the nonalcoholic beverage industry.

Articles about nonalcoholic beverages have become common in the press, focusing on their nutrition and the heavy consumption of specific beverages. Articles such as “Obesity Campaign Eyes School Drinks” (Buckley, 2003) and “Legislators Try to Limit Soft Drinks, Sugary Snacks at Schools” (Hellmich, 2003) address the trend of children overconsuming sweetened beverages and address ways to correct the problem through various forms of action. An article in the Journal of the American Dietetic Association stated that “consumers who are concerned about energy [caloric] intake should be made aware of the energy content of beverages, especially soft drinks and alcoholic beverages” (Chanmugan et al., 2003). Excess energy content, measured as calories, is directly related to obesity in children and adults. Obese children are more likely to have health and social problems than those who are not obese (Gortmaker et al., 1993).

This study examines the beverage purchase choices made by households and the nutritional consequences of those choices. The subject has policy significance for the U. S. Department of Agriculture (USDA) because it is the lead Federal agency for providing nutrition information to the public. Through the Food Guide Pyramid, the Dietary Guidance for Americans (produced jointly by USDA and the Department of Health and Human Services), and related materials, USDA provides consumers with information on the food and beverage choices they should make to have healthy diets. Many government programs tied to nutrition are in need of information on nonalcoholic beverage consumption. The Food Stamp Program, National School Lunch Program, School Breakfast Program, and Special Supplemental Nutrition Program for Women, Infants, and Children are examples of USDA-sponsored food assistance programs. USDA provided food assistance and nutrition benefits to one out of five Americans at a cost of $41.6 billion in fiscal year 2003. The largest of these programs, the Food Stamp Program, allows consumers to make their own food purchase choices. But, through funding for food stamp nutrition education, the program attempts to educate low-income households to use their food assistance benefits to make wise food choices.

Other programs, such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), Child and Adult Care Food Program (CACFP), and the School Meals Programs, mandate certain choices. WIC vouchers can be spent only on certain foods, with milk and vitamin C-rich fruit juices the only beverage choices allowed for women and young children. The Child Nutrition Programs (CACFP, School Meal Programs, and Summer Food Service Program) require that meals and snacks subsidized through these programs follow a nutritious pattern, with milk a required element in meals. Fruit juice also is allowed.

By contract, School Meal Program regulations require that soft drinks not be served while USDA-subsidized meals are being served, although soft drinks can be available in vending machines in other locations in some of these schools. Despite USDA efforts to encourage milk and juice beverage choices, there has been a trend among schoolchildren to drink less milk and to drink more of other beverages, especially soft drinks. Concerns have been raised that this trend may contribute to excess calorie consumption and declining intakes of important nutrients such as calcium. More recently, trends seem to be shifting, with bottled water consumption becoming increasingly important.

Policy Implications

Understanding beverage choices made by households, especially low-income households and households with children, is important to guiding USDA nutrition policy. The media coverage regarding obesity and nutrition-related health concerns of the increased consumption of sweetened nonalcoholic beverages has called attention to the problem. This study provides economic and nutritional benefit information on nonalcoholic beverage consumption for future studies. The findings are useful for the design of nutrition education programs and may also provide insights into how nutrition guidelines for foods provided through WIC and the Child Nutrition Programs can improve the overall nutritional quality of children's diets.

Influence of Beverage Choice on Obesity and Overweight

As a category, beverages vary tremendously in their energy (calorie) content and nutrient composition. Therefore, beverage choice has an important influence on dietary quality and the risk of obesity and overweight. With overweight and obesity now considered the most important nutrition-related health problem in America (HHS, Healthy People 2010, 2003), the caloric contribution of beverages to the problem is important. Such beverages offer a wide range of calorie options—from 0 calories for bottled water and diet soft drinks to high-calorie coffee drinks that can provide more than 400 calories per 16-ounce cup (Yale-New Haven Nutrition Advisor, 2004).

Research indicates that calories from liquids (especially clear, nonviscous liquids like soft drinks and juices) are regulated differently than calories from solid food (Mattes, 1996). They do not trigger feelings of satiety that limit additional eating. Therefore, beverage preferences may be important for avoiding excess eating and cutting the risk of obesity. Individuals who prefer water or diet soft drinks run less risk of excess calorie consumption than those who prefer caloric beverages.

Impact on Nutrient Intake

Nutrients can be obtained from many different food sources, including beverages. Milk, in particular, is a major source of calcium and vitamin D, two nutrients that are of current public health concern (HHS, Healthy People 2010, 2003). Yen and Lin (2002), in an analysis of USDA food consumption survey data, found that on average, for each 1-ounce reduction in milk consumption, a child's calcium consumption declines by 34 mg.

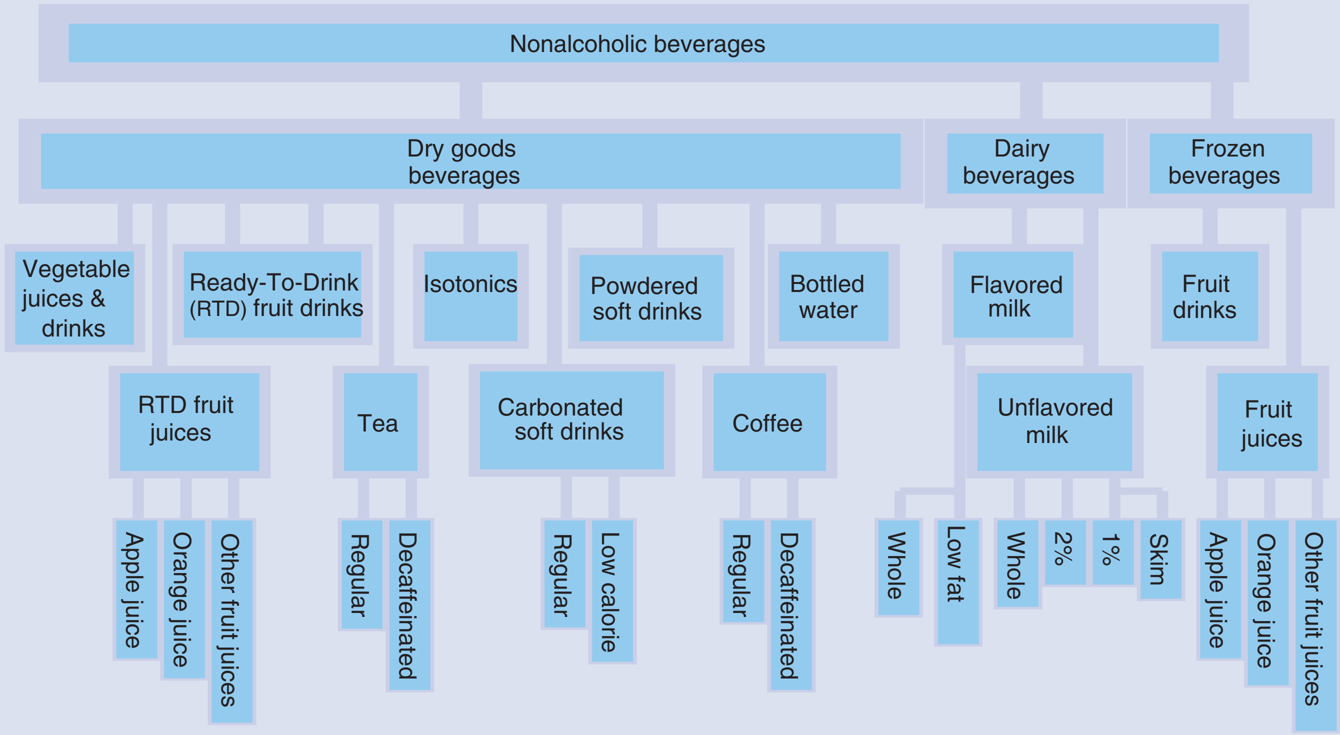
Juices vary in nutrient content depending on the fruit or vegetable from which they are extracted, but they are generally good sources of vitamin C, either naturally or through fortification. USDA's WIC program includes vitamin C-rich fruit and vegetable juices in the package it provides to recipients. Fruit-flavored drinks and "-ades" (e.g., lemonade) are commonly fortified with vitamin C. They also are sources of added sugars, a nutrient category that USDA's Food Guide Pyramid recommends limiting. Among the general population, fruit-flavored drinks and "ades" contribute approximately 10 percent to total consumption of added sugars. They are a more important source of added sugars for young children, contributing approximately 19 percent to the added-sugars intake of children 2-5 years of age (Guthrie and Morton, 2000).

Soft drinks are the major source of added sugars in American diets, contributing approximately a third of the added-sugars intake of Americans 2 years of age and older (Guthrie and Morton, 2000). Soft-drink consumption has risen dramatically in the past decades; USDA food supply data show that availability of regular soft drinks rose from 28.7 gallons per capita in 1977 to a high of 38.2 gallons in 1999. Figures for 2000-01 show a slight decline to 37.2 gallons per capita in 2001. Despite Americans' professed concern with losing weight, diet soft drinks grew slowly from 4.3 gallons per capita in 1977 to 11.8 gallons per capita in 2001.

Soft drinks may displace more nutritious beverages from the diet and, if the soft drinks are sweetened (nondiet), they add calories. Yen and Lin found that, on average, for each 1-ounce reduction in milk consumption, a child consumes 4.2 ounces of soft drinks, resulting in a net gain of 31 calories, as well as a loss in calcium intake.

The growth of soft-drink consumption also has made these beverages major contributors to caffeine intake, especially among children. Ahuja and Perloff (2001) estimate that caffeine-containing carbonated beverages contribute 52 percent of the caffeine in the diets of children 9 years of age and younger. Chocolate milk, coffee, and tea also contribute caffeine to the diets of children and adults. (See"Beverage Categories" box for list of drinks.)

ACNielsen Homescan Data Beverage Categories



Source: ACNielsen Homescan data.

Role of the Home Food Supply in Beverage Consumption

In recent decades, there has been a steady rise in the consumption of food prepared away from home. Between 1977-78 and 1994-96, consumption of food prepared away from home increased from 18 percent to 32 percent of Americans' total calories (Guthrie et al., 2002). Shifts in sources of beverages consumed parallel this trend; French et al. (2003) report that in 1994-98 compared with 1977-78, children obtained an increasing share of their total soft drink intake from restaurants, fast food places, and vending machines. The home food supply was still the most important source of soft drinks consumed by children. Therefore, the home food supply still has an important impact on overall beverage consumption. In addition, it may shape tastes and preferences that influence choices made outside the home.

Objectives

The hypothesis set forth in this study is that nonalcoholic beverage consumption differs by socioeconomic and demographic factors, resulting in a range of nutrient intakes per person derived from beverages purchased for at-home consumption. This study addresses and analyzes the nutrients available for intake from nonalcoholic beverages consumed at home, focusing on calories, calcium, vitamin C, and caffeine. Using a specialized scanner data set with demographics attached, the 1999 ACNielsen Homescan panel, the focus is on household purchases over an entire year recorded by scanning equipment. USDA also employs the Continuing Survey of Food Intakes for Individuals (CSFII), which focuses on food intake, based on individual recall, over 2 nonconsecutive days (within a 3-week period). Consequently, the Homescan panel offers a potentially richer and more recent database than the CSFII, which has not been done since 1994-98.

A limitation of the Homescan panel is that it reflects only household availability of nutrients; there is no further diaggregation into within-household differences in consumption. Moreover, some food purchased for home consumption may go uneaten or be consumed by guests. Nevertheless, purchasing patterns provide insight into the beverage choices available to household members and can be particularly useful for nutrition education programs that include information on improving household purchasing choices, such as USDA Food Stamp Nutrition Education.

A comparative investigation of both at-home and away-from-home intakes of selected products would be ideal. This study, however, will center attention only on at-home household use of the selected products, for two major reasons. First, data on away-from-home consumption with household demographic variables are not generally available for such research. Available data are focused on at-home consumption and do not reflect away-from-home consumption patterns. Second, available price series are limited to commodities and products consumed in the at-home market.

Analysis of Average Available Intakes of Calories, Calcium, Vitamin C, and Caffeine

On average, at-home available per person intake of nonalcoholic beverages accounts for, roughly, 195 calories per day, 196 mg of calcium per day, 41 mg of vitamin C per day, and nearly 88 mg of caffeine per day, (table 2). The conversion of available intakes to calories and milligrams was accomplished using the nutritive values of each beverage item found in the USDA publication *Home and Garden Bulletin* (No. 72, October 2002). These

Table 2—Summary statistics for nutrients per person per day for nonalcoholic beverages, 1999

Item	Calories	Calcium	VitC	Caffeine
Mean	194.60	196.16	41.42	87.68
StDev *	138.74	169.28	37.99	108.61
CV **	71.30	86.29	91.72	123.87
Minimum	0.40	0	0	0
Median	165.95	149.42	31.80	52.78
Maximum	3,492.41	2,149.57	443.13	2,571.13

Item	CALcsdfdpsd[1]	CALfjuices[2]	CALmilk[3]	CAFFcsd[4]
Mean	86.95	35.87	65.92	23.45
StDev	104.41	40.78	62.44	30.63
CV	120.09	113.71	94.72	130.59
Minimum	0	0	0	0
Median	58.49	23.54	48.54	15.16
Maximum	3,441.72	555.39	616.55	1,196.29

Item	CAFFcoff[5]	CAFFtea[6]	VITCfjuices7	VITCcsdfdpsd[8]
Mean	59.04	5.09	24.62	14.39
StDev	101.97	10.72	29.62	21.12
CV	172.72	210.62	120.34	146.73
Minimum	0	0	0	0
Median	19.20	1.19	15.01	7.45
Maximum	2570.95	152.77	428.21	383.29

Item	CALCIUMmilk[9]
Mean	172.92
StDev	164.91
CV	95.37
Minimum	0
Median	127.18
Maximum	2,137.99

[1] Calories from carbonated soft drinks, fruit drinks, and powdered soft drinks.
[2] Calories from fruit juices.
[3] Calories from milk.
[4] Caffeine from carbonated soft drinks.
[5] Caffeine from coffee.
[6] Caffeine from tea.
[7] Vitamin C from fruit juices.
[8] Vitamin C from carbonated soft drinks, fruit drinks, and powdered soft drinks.
[9] Calcium from milk.
* StDev = Standard deviation.
** CV = Coefficient of variation.
Note: Units of measurement are: calories (kcal); calcium, vitamin C, and caffeine (mg).
Source: ERS analysis of ACNielsen Homescan data.

figures subsequently were divided by 365 and were further divided by household size. Major contributors to available calories from nonalcoholic beverages were carbonated soft drinks; fruit drinks and powdered soft drinks (about 45 percent); fruit juices (about 18 percent); and milk (about 34 percent). Milk also was responsible for roughly 88 percent of the calcium available from the nonalcoholic beverage category. Fruit juices contributed almost 60 percent of the vitamin C available from nonalcoholic beverages, while carbonated soft drinks, fruit drinks, and powdered soft drinks contributed 35 percent of the vitamin C available, on average. Coffee, carbonated soft drinks, and tea accounted for 67 percent, 27 percent, and 6 percent, respectively, of the caffeine available from nonalcoholic beverages.

To give these descriptive findings more perspective, using the same 2,000 calories per day standard as is used for nutrition labeling of food, 10 percent of calories would come from the at-home purchase of nonalcoholic beverages. On average, about 20 percent of the nutrition label daily value (DV) for calcium and close to 70 percent of the daily value for vitamin C come from nonalcoholic beverages. On average, the daily available intake of caffeine from nonalcoholic beverages was equivalent to almost two 12-ounce cans of Coca-Cola, about one 7-ounce cup of coffee, or roughly a 15-ounce glass of iced tea.

Demographic Analysis

Available nutritional intake from nonalcoholic beverages varied by different demographic factors. This section includes a discussion of the factors including race, income, education of female head, employment of female head, age of female head, household size, and the presence of children.

Hispanic/Non-Hispanic

On average, availability of calories, calcium, vitamin C, and caffeine were lower for Hispanics than for non-Hispanics (fig. 3, data table 1). Noteworthy differences in available intakes for Hispanics and non-Hispanics centered on calcium and caffeine. Available calcium intake for Hispanics was lower by roughly 30 mg per day in comparison with non-Hispanics. Available caffeine intake for Hispanics was lower by about 20 mg per day relative to non-Hispanics.

Region

Available caloric intake on a per-person-per-day basis from nonalcoholic beverages was lowest in the West, 178 kcal, and highest in the Central region, 209 kcal (fig. 4, data table 2). Available calcium intakes, on average, ranged from 184 mg per person per day in the East to 218 mg per person per day in the Central region. Available vitamin C intake from nonalcoholic beverages, on average, varied from 37 mg in the West to 45 mg in the East. Available caffeine intakes, on average, were lowest in the West and South (82 mg and 83 mg, respectively) and highest in the Central region and the East (91 mg and 96 mg, respectively).

Race

On a per-person-per-day basis, Asians had the lowest available intake of calories, vitamin C, and caffeine on average, whereas Whites had the highest available intake of these nutrients, except for vitamin C, on average (fig. 5, data table 3). Blacks had the highest available intake of vitamin C per person per day, and Blacks had the lowest available intake of calcium per person per day.

Poverty Status

In households classified below the 130 percent of poverty threshold, available caloric and caffeine intakes on a per-person-per-day basis were about 4 to 5 kcal higher than in households classified as above the 130 percent of poverty thresholds (fig. 6, data table 4). Available calcium intake and available vitamin C intake, however, were about 20 mg and 6 mg lower for households below the 130 percent of poverty threshold than for households above the 130 percent of poverty threshold.

Education of Female Head

In households where the female head was a college graduate, available caloric, calcium, and caffeine intakes from nonalcoholic beverages on a per-person-per-day basis were lower than in households where the female head was not a college graduate (fig. 7, data table 5). The situation was the reverse in the case of vitamin C availability.

Employment of Female Head

In households where the female head was not employed for pay, average available intakes of calories, calcium, vitamin C, and caffeine from nonalcoholic beverages were higher in comparison with households where the female head was employed (fig. 8, data table 6). These data, however, were associated with at-home consumption of nonalcoholic beverages, and as such, this result was perhaps not too surprising because we suspect that households with an employed female head eat more away-from-home meals than unemployed female headed households.

Age of Female Head

In households where the female head was younger than 25 years of age, available caloric intakes from nonalcoholic beverages, principally for at-home consumption, were highest (fig. 9, data table 7). Available caloric intakes, on average, were lowest for female heads between 25 and 29 years of age. Calcium, vitamin C, and caffeine available intakes from nonalcoholic beverages were highest for female heads at least 55 years of age. Calcium and vitamin C available intakes were lowest for female heads between 25 and 34 years of age. Caffeine available intakes were lowest for female heads younger than 25 years of age.

Household Size

Except for households with eight members, daily per person available intakes of calories, calcium, vitamin C, and caffeine decreased almost monotonically with household size (fig. 10, data table 8).

Presence of Children

Average available calcium, vitamin C, and caffeine intakes from nonalcoholic beverages on a per-person-per-day were higher in households with no children relative to households with children either younger than 6, 6 to 12, or 13 to 17 years of age (figs. 11a, 11b; data table 9). Households with children 13 to 17 years of age had higher daily available caloric intakes per person than did households with no children, but it was difficult to determine if this result was a scale effect.

How Consumers Decide To Buy or Not To Buy Nonalcoholic Beverages

Cross-tabulation analysis indicated that there might be differences in the amount of beverages purchased based on household demographics. However, no statistical significance was shown. Averages of purchases and the number of households that bought a beverage for each demographic category were given. The demographics associated with choice of consumption are of interest. A probit analysis, which calculates the likelihood of consumers with known demographic characteristics to purchase, is used to determine which demographics are responsible for a household choosing to buy or choosing not to buy a beverage. The probit analysis will provide statistically significant findings of which demographics increase or decrease the probability of purchasing nonalcoholic beverages. The demographics along with the categories in each group that are used for the probit analysis are included in this section. The beverage groupings to be analyzed also are included (table 3). This probit analyses feature ready-to-drink fruit juices (not frozen); ready-to-drink fruit drinks; isotonics; powdered soft drinks; tea; coffee; carbonated soft drinks; bottled water; and flavored and unflavored milk.

All of the demographic categories are expressed by dummy variables, a "1" is indicative of that demographic being present in the household, a "0" indicates

Table 3—Demographics and nonalcoholic beverages analyzed

Demographics used for probit analysis	Nonalcoholic beverages used in the analysis
Household size 1—base	
Household size 2	RTD fruit juices not frozen
Household size 3	RTD fruit drinks
Household size 4	Isotonics
Household size 5	Powdered soft drinks
Age household head less than 25—base	Tea
Age household head 25-39	Coffee
Age household head 40-49	Carbonated soft drinks
Age household head 50-64	Bottled water
Age household head 65 +	Flavored milk
Has no children under 18—base	Unflavored milk
Has children under 18	
Household head employment not employed—base	
Household head employment part-time	
Household head employment full-time	
Household head education less than high school—base	
Household head education—high school	
Household head education—some college	
Household head education—college plus	
White—base	
Asian	
Other	
Not Hispanic—base	
Hispanic	
East region—base	
Central region	
South region	
West region	
> 130% poverty—base	
< 130% poverty	

Source: ACNielsen Homescan data.

otherwise. The base categories listed are not placed into the probit equations to avoid perfect collinearity. As a result, the findings must be compared relative to the base category. For example, households in the Central region were statistically more likely to purchase powdered soft drinks than were households in the eastern region (the base category).

The probit results are summarized in table 4. Each beverage is listed along with the demographic group. If the demographic category was statistically significant (at the 95-percent confidence level) in affecting the decision to consume the beverage, then an "X" is presented in the table. An F-test was conducted on the categories in each demographic group to find the statistically significant drivers.

Race and region of the household were important in the decision to purchase many of the beverages. Household size and age of the head of household affected the decision to buy for all 10 beverages examined. The demographic of household size is understandable since larger households typically purchase more goods at grocery stores and would be less apt to eat away from the home. The presence of a child in a household affected the decision of a household to purchase fruit drinks, isotonics, powdered soft drinks, and flavored milk. Poverty status of the household affected four of the beverages studied: fruit juices, isotonics, powdered soft drinks, and bottled water.

Table 4—Summary of probit analysis

Item	Household size	Age of female Head	Presence of children	Female employment
RTD fruit juices not frozen	X	X		
RTD fruit drinks	X	X	X	
Isotonics	X	X	X	
Powdered soft drinks	X	X	X	
Tea	X	X		
Coffee	X	X		X
Carbonated soft drinks	X	X		
Bottled water	X	X		
Flavored milk	X	X	X	
Unflavored milk	X	X		

Item	Female education	Race	Hispanic	Region	Poverty
RTD fruit juices not frozen	X	X		X	X
RTD fruit drinks	X	X			
Isotonics		X		X	X
Powdered soft drinks	X	X		X	X
Tea				X	
Coffee	X	X	X	X	
Carbonated soft drinks		X			
Bottled water		X		X	X
Flavored milk	X	X		X	
Unflavored milk					

Note: This table shows which demographics are significant (95% level) in determining whether or not a household consumes any of the beverages. If an "X" appears then the demographic is significant.

Source: ERS analysis of ACNielsen Homescan data.

After examining the summary table of the probit findings (data table 10), the individual probit results for each beverage subsequently are discussed. For each beverage, a probit model was run and the p-values associated with each demographic category were retrieved. An F-test on each demographic group also was conducted. Lastly, the marginal effects of each demographic category were computed. These effects show the magnitude of the increase or decrease in the probability of purchasing each beverage, relative to a base category.

Ready-To-Drink Fruit Juices

Household size, age of the household head, household head education, race, region, and poverty status of the household were significant demographics affecting the choice to purchase ready-to-drink fruit juices. Household size and the probability of buying ready-to-drink fruit juices were positively associated. Household heads with more education were more likely to buy fruit juice (fig. 12). Black, Asian, and Other households were more likely to buy fruit juices compared with White households (fig. 13). Households located in the Central, South, or West regions were less likely to purchase fruit juices compared with households located in the East region (fig. 14). Households under 130 percent of poverty were less likely to buy fruit juices than were households over 130 percent of poverty.

Ready-To-Drink Fruit Drinks

Household size, age of the household head, presence of children, education of household head, and race were significant demographic factors affecting the choice to buy ready-to-drink fruit drinks. Again, household size and the probability of buying ready-to-drink fruit drinks were positively related. As shown in figure 15, households with heads older than 25 years old were less likely to purchase ready-to-drink fruit drinks than were households with heads under age 25. As exhibited in figure 16, Black, Asian, and Other households were more likely to buy ready-to-drink fruit drinks when compared with White households. Black households were the most likely group to buy ready-to-drink fruit drinks.

Tea

Household size, age of the household head, and region were the significant demographic factors affecting the choice to buy tea. The probability of purchasing tea and household size were positively associated. According to figure 17, household heads older than 40 years old were more likely to purchase tea than were households with heads under the age of 25. Households with heads in the 25-39 age bracket were less likely to purchase tea compared with households with heads under age 25. Households located in the Central, South, or West region were less likely to buy tea when compared with households located in the East region (fig. 18).

Coffee

Household size, age of the household head, employment of the household head, education of the household head, race, Hispanic origin, region, and poverty status were demographics that affect the choice to purchase coffee. Households with larger household sizes and household heads older than 25 increased the probability of purchasing coffee. As exhibited in figure 19, household heads that were employed were less likely to buy coffee for at-home consumption than those who were not employed. Heads of household who were better educated were less likely to purchase coffee for at-home consumption than households with less educated household heads (fig. 20). Households of Hispanic origin were more likely to buy coffee for at-home use than non-Hispanic households were. Households located in the Central, South, or West region were less likely to purchase coffee for at-home use when compared with households located in the East region. Households under 130 percent of poverty were less likely to purchase coffee for at-home use than were households over 130 percent of poverty.

Isotonics

Household size, age of the household head, presence of children, race, region, and poverty status were demographics that affected the choice to purchase isotonics, which contain nutritional supplements. Household size and the probability of buying isotonics were positively correlated. As shown in figure 21, households with heads aged 25-49 were more likely to purchase isotonics than those with heads under the age of 25. Households with heads aged 50 and over were less likely to purchase isotonics than those with heads under the age of 25. Households with a child present were more likely to buy isotonics for at-home consumption than were households with no children present. Black and Asian households were less likely than White households to buy isotonics (fig. 22). Households located in the Central, South, or West regions were more likely to buy isotonics when compared with households located in the East region. Households below 130 percent of poverty were less likely to buy isotonics for at-home use than were households above 130 percent of poverty.

Powdered Soft Drinks

Household size, age of the household head, presence of children, education of household head, race, region, and poverty status were demographics that affected the choice to purchase powdered soft drinks. Household size and the probability of buying powdered soft drinks were positively related. Households with heads aged 25-49 were more likely to buy powdered soft drinks than were those with heads under the age of 25. Households with heads aged 50 and older were less likely to buy powdered soft drinks than were those with heads under the age of 25. Heads of households with a high school education were more likely to purchase powdered soft drinks than were the household heads with less than a high school education. Heads of households with an education above high school were less likely to buy a powdered soft drink than were those with less than a high school education. Black households were more likely than White households to buy powdered soft drinks, while Asian households were less likely to purchase powdered soft drinks than Whites (fig. 23). Households under 130 percent of the poverty level were more likely to buy powdered soft drinks for at-home consumption than were households over 130 percent of the poverty level. Households located in the Central and South regions were more likely to purchase powdered soft drinks than households located in the East (fig. 24). Households located in the West were less likely to purchase powdered soft drinks compared with the East.

Carbonated Soft Drinks

Household size, household head age, and race influenced the choice to buy carbonated soft drinks. Household size and the probability of buying carbonated soft drinks were positively linked. Household heads aged 25 to 64 were more likely to buy carbonated soft drinks relative to household heads under 25, while household heads aged 65 and older were less likely to buy carbonated soft drinks compared with households with the head under age 25 (fig. 25). Black households were more likely to buy carbonated soft drinks for at-home use than were Whites. Asian and Other races were less likely to purchase carbonated soft drinks for at-home use when compared with White households (fig. 26).

Bottled Water

Household size, age of the household head, race, region, and poverty status affected the choice to purchase bottled water. Household size and the probability of buying bottled water were positively associated. Household heads aged 25 to 64 increased the probability of purchasing bottled water versus those household heads under age 25. Household heads age 65 and older lowered the likelihood of bottled water purchases compared with household heads under age 25. Black, Asian, and Other households were more likely to buy bottled water than were White households (fig. 27). Households located in the central region were less likely than households residing in the East to buy bottled water, while households located in the West and South were more likely to buy bottled water relative to households located in the East (fig. 28). Households below 130 percent of poverty level were less likely to purchase bottled water than were households above 130 percent of poverty level.

Flavored Milk

Household size, age of the household head, presence of children, education of the household head, race, and region were demographics that influenced the choice to buy flavored milk. Household size and the probability of buying flavored milk were positively correlated. Household heads aged 25 to 49 increased the probability of buying flavored milk compared with those household heads under 25. Household heads age 50 and older lowered the likelihood of purchasing flavored milk compared with households headed by someone under age 25 (fig. 29). Households with a child present were more likely to buy flavored milk. Household heads having post-high school education were more likely to purchase flavored milk than were household heads with less than a high school education. Households where the head had an education greater than high school were less likely to purchase flavored milk when compared with households with less than a high school education. Central and South households were more likely to buy flavored milk than East households, while West households were less likely to buy flavored milk when compared with East households (fig. 30).

Unflavored (White) Milk

Household size and age of the household head were the only demographics that affected the choice to purchase unflavored milk. Larger households were more likely to buy unflavored milk than smaller households (fig. 31). Households where the age of the head was greater than 25 were much less likely to buy unflavored milk than were households where the head was under age 25 (fig. 32).

Prediction Success of the Probit Models

After finding that demographic factors were significant drivers associated with the choice of to buy or not to buy nonalcoholic beverages, predictions of the decision to buy or not to buy were made (data table 11). If the predicted probability of purchasing was larger than the percentage of households in the data set that actually bought, then the household was predicted to be a purchaser (consumer). For example, if we predicted a probability of 0.65 that a household would purchase powdered soft drinks, we would classify that household to be a purchaser since 0.65 is greater than 0.4852 (the percentage of households in the panel that actually bought powdered soft drinks). This process was done for all 10 beverages. The results of the prediction experiment are included in data table 11.

Overall, knowing the demographics helps in predicting the purchases of nonalcoholic beverages. The findings are broken down into several categories in the table. The percentage of total correct predictions (correctly predicting if the nonalcoholic beverage was bought and correctly predicting if the beverage was not bought) is given in one column. The most difficult nonalcoholic beverage to predict was tea, with only a 58-percent correct prediction rate. The choice of buying carbonated soft drinks and unflavored milk was the easiest to predict, with correct predictions of over 70 percent. The last two columns show that the probit analysis helps predict which households will buy, given that they actually do, as well as predicting which households will not buy, given that they actually do not. For the nonalcoholic beverages considered, the probit models correctly predicted household purchase behavior in 56.8 percent (tea) to 72.1 percent (carbonated soft drinks) of the sample. For nonpurchase behavior, the probit models were correct in 59.3 percent (bottled water) to 80.9 percent (ready-to-drink fruit drinks) of the sample of 7,195 households.

Regression Analysis of Caloric, Calcium, Vitamin C, and Caffeine Intakes

Regression analysis of nutrients per person per day derived from nonalcoholic beverages as a function of demographic variables was a study component. The purpose is to understand key drivers, at least by demographic groups, associated with daily nutrient intakes. We direct attention to the female household head (age, employment status, and education). We assume the female household head is the household manager, the person primarily responsible for food shopping and/or food preparation. If there is no female household head, we use the male household head as the household manager. The level of significance chosen for these analyses is 0.05 (data table 12).

Calories

Employment status of the household head, education of the household head, race, region, and the presence of children were statistically important in the determination of daily caloric intakes per person. Households where the household manager was employed either part-time or full-time had lower caloric intakes derived from nonalcoholic beverages than households where the household head was not employed for pay. The difference in the daily caloric intake was between 10 kcal for household heads employed full-time to 18 kcal for household heads employed part-time.

Households where the household manager has a college degree had lower caloric intakes, by roughly 22 kcal, relative to households where the household manager lacks a high school degree. The caloric intake of Asians is lower by 45 kcal relative to Whites. No statistically significant differences in caloric intakes existed among Whites, Blacks, or Other races. No statistically significant differences existed in daily caloric intakes derived from nonalcoholic beverages between Hispanics and non-Hispanics.

Regional differences in caloric intakes were evident. Relative to the East, caloric intakes in the Central region were higher by 21 kcal, and the caloric intakes in the South were higher by 10 kcal. Daily caloric intakes in the West were lower by 9 kcal relative to the East.

In households where children are present, caloric intakes were lower by 21 kcal in comparison with households where children were not present. Importantly, age of the household manager was not a determinant of calories derived from nonalcoholic beverages, except for the age-65-plus group. In addition, poverty status of the household was not a driver of calories generated from nonalcoholic beverages.

Calcium

Age of the household manager was not a factor in affecting the daily calcium intake derived from nonalcoholic beverages. In households where the household manager was employed, calcium intakes were lower by 25 to 29 mg relative to households where the household manager was not employed for pay. In households where the household manager had at least a high school education, calcium intakes were higher by 16 to 22 mg relative to households where the household manager did not have a high school education.

Calcium intakes were lower by 95 mg for Blacks relative to Whites; also they were lower by 61 mg for Asians in comparison with Whites. No statistically significant differences existed in daily calcium intakes derived from nonalcoholic beverages between Hispanics and non-Hispanics.

Daily intakes of calcium were higher by almost 30 mg for the Central region relative to the East. No significant differences existed however in calcium intakes between the South, the West, and the East. Importantly, calcium intakes derived from nonalcoholic beverages were lower by 21 mg for households below the 130 percent of poverty threshold relative to households above the 130 percent of poverty threshold level (table 1). In households where children were present, calcium intakes were lower by nearly 11 mg compared with households where children were not present.

Vitamin C

Age of the household manager was not a key factor in affecting daily vitamin C intakes derived from nonalcoholic beverages. In households where children were present, daily vitamin C intake was lower by almost 7 mg relative to households where children were not present.

In households where the household manager was employed either part-time or full-time, vitamin C intakes were lower by 1 to 4 mg relative to households where the household manager was not employed for pay. In households where the household manager had at least a high school education, vitamin C intakes were higher by 4 to 9 mg relative to households where the household manager did not have a high school education.

Vitamin C intakes were higher by nearly 17 mg for Blacks compared with Whites. They also were higher by 6 mg for Other races, excluding Asians, compared with Whites. No significant differences existed in vitamin C intake generated from nonalcoholic beverages between Whites and Asians. No significant differences existed in vitamin C intake between Hispanics and non-Hispanics.

Daily vitamin C intake was highest in the East. The difference in vitamin C intake between the East and the Central region was slightly more than 5 mg; between the East and the South about 3 mg; and between the East and the West nearly 9 mg. Vitamin C intakes derived from nonalcoholic beverages were lower by almost 6 mg for households below the 130 percent of poverty threshold relative to households above this threshold.

Caffeine

Unlike the situation for calories, calcium, and vitamin C, age of the household manager was a determinant of daily intakes of caffeine. Daily caffeine intakes rose in households as the age of the household manager rose—higher by 23 mg for 40 to 49 years old, higher by 59 mg for household managers 50 to 64 years old, and higher by 55 mg for elderly (65-plus) household managers compared with household managers younger than 25 years. In households where the household manager was employed, daily caffeine intake was lower by 7 to 10 mg relative to households where the household manager was not employed for pay. Except for the college-plus group, education of the household manager was not a significant factor, statistically, of daily intakes of caffeine derived from nonalcoholic beverages.

In households where children were present, daily caffeine intakes were lower by roughly 37 mg relative to households where children were not present. Caffeine intake was lower by 37 mg, 33 mg, and 19 mg for Blacks, Asians, and Other races, compared with Whites. No significant differences existed in caffeine intake between Hispanics and non-Hispanics.

In households located in the Central region, the South, and the West, caffeine intakes were lower by 8 mg, 11 mg, and 17 mg, respectively, relative to households located in the East. No statistically significant differences existed in caffeine intake between households above or below the 130 percent of poverty threshold.

Preparation of the 1999 ACNielsen Homescan Panel Data

The data set used in this study is the 1999 ACNielsen Homescan panel data, purchased by USDA in 2002 for use in several projects supported by Economic Research Service. This project addressed the goal of determining the types of nonalcoholic beverages purchased by U.S. households in different demographic segments. One of the benefits of using these data for this study was to determine if this type of scanner data could be used as a viable alternative to other more costly and scarce data sources.

Data Description

The ACNielsen Homescan data set is drawn from a sample of households that are demographically balanced within 19 markets and 4 Census regions in the United States. Sample households are projected to market universes and weighted so that a nationally representative sample captures buying patterns of U.S. consumers. The ACNielsen Homescan data are unique in that the information is similar to a survey. Each household was supplied with a scanner device that was used to record all items purchased at different retail trade locations throughout a given time period. Each panelist represented a unique household, with each household having 17 known demographic characteristics (table 5).

The ACNielsen households surveyed represented 52 different cities, which was 84.34 percent of the surveyed respondents, as well as unidentified rural areas, which represented 15.66 percent of the surveyed households (table 6).

Table 5—Demographic characteristics of panelist households

Panelist descriptives	Number of categories within each description
1. Household size	9
2. Household income	16
3. Age of female head[1]	10
4. Age of male head[2]	10
5. Age and presence of children	8
6. Male head employment[2]	5
7. Female head employment[1]	5
8. Male head education[2]	7
9. Female head education[1]	7
10. Marital status	5
11. Male head occupation[2]	12
12. Female head occupation[1]	12
13. Household composition	8
14. Race	4
15. Hispanic origin	2
16. Region	4
17. Scantrack market identifier	53

[1] Female head of household is the primary person making food purchase decisions.
[2] Male head of household is the primary person making food purchase decisions.

Source: ERS analysis of ACNielsen Homescan panel data.

The survey covered 4 regions of the lower 48 States of the United States—East, Central, South, and West.

The regional representation of the surveyed U.S. households was similar to the 1999 Bureau of Census regional representation by percent of households surveyed:

- East—20.0 percent (Census); 20.3 percent (ACNielsen)
- Central—24.0 percent (Census); 25.3 percent (ACNielsen)
- South—34.0 percent (Census); 34.3 percent (ACNielsen)
- West—22.0 percent (Census); 20.0 percent (ACNielsen).

Although ACNielsen Homescan data include purchases of all consumer items bought during a specified time period, the nationally representative data that was used in this study included only consumer purchases of food items. Household level purchase data and demographic information were included for 7,195 household panelists who were in the sample during at least 10 out of 12 months beginning January 3, 1999 through January 1, 2000. The household level food purchase data are divided into four product type groups:

(1) Dry grocery (4,111,719 records)
(2) Dairy (873,899 records)
(3) Frozen (1,002,851 records)
(4) Random weights (507,306 records).

Table 6—Panelist households' locations

Scantrack market	Percent of households surveyed	Scantrack market	Percent of households surveyed
Rural	15.66	San Diego	0.61
Boston	1.30	St. Louis	0.96
Chicago	10.46	Tampa	0.77
Houston	0.56	Baltimore	4.30
Indianapolis	1.27	Birmingham	0.25
Jacksonville	0.28	Buffalo-Rochester	1.04
Kansas City	0.76	Hartford-New Haven	1.17
Los Angeles	11.26	Little Rock	0.15
Suburban New York	5.47	Memphis	0.08
Urban New York	3.81	New Orleans-Mobile	0.18
Non-urban New York	2.79	Oklahoma City-Tulsa	0.13
Orlando	0.48	Phoenix	1.83
San Francisco	0.64	Raleigh-Durham	0.23
Seattle	0.71	Salt Lake City	1.57
Atlanta	13.79	Columbus	0.58
Cincinnati	0.94	Washington, DC	8.83
Cleveland	1.01	Albany	0.49
Dallas	0.40	Charlotte	0.56
Denver	0.86	Des Moines	0.49
Detroit	1.32	Grand Rapids	0.91
Miami	0.64	Louisville	0.18
Milwaukee	0.63	Omaha	0.56
Minneapolis	0.56	Richmond	0.28
Nashville	0.16	Sacramento	0.48
Philadelphia	1.80	San Antonio	7.51
Pittsburgh	1.43	Syracuse	1.45
Portland, Oregon	1.09		

Source: ACNielsen Homescan data.

Each of the four groups contained numerous product modules, with each product module further subdivided into brand, size, flavor, form, formula, container, style, type and variety. Each product was represented by a unique unit product code (UPC). In addition to demographic information, total expenditure and quantity information were recorded for each transaction. This information was used to impute the price per unit for the food items analyzed in this study.

Data Selection Process

This step included the process of selecting and organizing the data so that it was usable for analytical and descriptive purposes. The primary objective was to understand consumer demand and nutritional issues associated with nonalcoholic beverages purchased for at-home use. The beverages included in this study were all milk items, isotonics (sports drinks), bottled water, fruit juices and drinks, coffee and tea, and carbonated and noncarbonated soft drinks. (See box, "Nonalcoholic beverage categories.")

The process of obtaining a usable data set included determining which product modules were needed to construct the appropriate final data set. Of the many hundreds of modules in the data set, 53 beverage modules were

Nonalcoholic beverage categories

Ready-To-Drink (RTD) fruit juices not frozen
Apple juice not frozen
Orange juice not frozen
Other fruit juices not frozen
Ready-To-Drink fruit drinks
Isotonics–sports drinks
Powdered soft drinks
Vegetable juices and drinks
Tea
Tea–regular
Tea–decaffeinated
Coffee
Coffee–regular
Coffee–decaffeinated
Carbonated soft drinks
Carbonated soft drinks–regular
Carbonated soft drinks–low calorie
Bottled water
Milk–flavored and unflavored
Flavored milk
Unflavored milk
Flavored milk–low fat
Flavored milk–whole
Unflavored milk–whole
Unflavored milk–2%
Unflavored milk–1%
Unflavored milk–skim
Fruit juices frozen
Frozen fruit drinks
Other fruit juices frozen
Apple juice frozen

Source: ACNielsen Homescan data.

selected for analysis. Several of the 53 modules were further disaggregated or aggregated to create other modules, which also were used in constructing the final data set. The final data set contained 77 different beverage product modules (data table 13). The purpose of the aggregation/disaggregation process was to group the beverages in modules that would allow for a thorough analysis. Not only might the effects of the particular beverage, such as milk, be important, but the effects from different varieties of milk—flavored, unflavored skim, low fat, etc.—also might be important. A listing of the different aggregations of modules is included in data table 14.

Each of the 77 beverage modules was converted into the common measure of gallons in order to have valid comparisons with the other modules. This process required two things: First, a knowledge of the form, size and quantity of the products in the modules, and second, the rate of conversion for each form, size, and quantity. The first step was simple since the product form, size, and quantity were included in each record. The second step was not as simple and in some cases required actual physical examination of a product before it could be converted into gallons.

After the product modules were extracted, created, and converted to gallons, further checking of the actual data was necessary. A very limited number of records were unusable because expenditures were missing. After removing the records that were unusable, the imputation of prices (ratio of expenditures to quantities) for the remaining records were completed. Price outliers, defined as imputed prices greater than five standard deviations from their means, were flagged and omitted. Records corresponding to these price outliers also were eliminated from the analysis. In data table 14, we delineate the number of missing expenditure records by product module together with the number of records corresponding to price outliers by product module.

The 1999 ACNielsen Homescan data include transactions that were made during the year and recorded by a scanner at home, and as such could be considered a panel data set with both cross-sectional and time-series characteristics. However, the sporadic nature of the time-series entries associated with the data set make it more practical to convert the home scan data to a cross-sectional type of data set. Since each record included purchase transactions by a particular household, each recorded transaction in the same product module was identified and combined to create an annual household consumption (purchase) quantity and expenditure amount for each module. Then, the household total purchase quantity and total expenditure amounts were used to impute an average annual household price for each module. In this study we explicitly assume that all beverage items purchased are consumed by the household. Thus we equate household purchases with household consumption and intake. For a summary of the 77 annual consumption figures, expenditure figures, and average annual prices, see data table 13. These descriptive statistics take into account the projection factors used to make this sample of households nationally representative.

This report serves to summarize the work done on the ERS cooperative project, "Demand Projections Segmented by Income for the Highly Competitive Nonalcoholic Beverage Complex Using the ACNielsen Homescan Panel Data." As the data are for 1999, this work constitutes a baseline analysis of economic and nutritional issues in conjunction with a choice of

77 nonalcoholic beverages, for both aggregate and disaggregated analysis. This 1999 baseline will be useful in future work for evaluating consumer impacts of the advice issued in 2000 and 2005 by the Dietary Guidelines for Americans, which gave increased emphasis to beverage choice, particularly soft drinks.

Cross-Tabulations of Household Purchases (Consumption)

Cross-tabulations were used to examine the relationship of household purchases of nonalcoholic beverages with various demographic factors. With this procedure, a specific demographic variable is identified and summary statistics are computed for the records in the data set that correspond to only those demographic criteria. For example, the average consumption in gallons per household of a selected beverage is calculated for each demographic category. It should be noted that the calculated averages include only the households that purchased the selected beverage. After all demographics variables are tabulated, comparisons can be made. To illustrate, the demographic variable region includes four categories: East, Central, South, and West. Average levels of consumption for the households in each region were calculated. A comparison among the households in the four regions quickly reveals if there is a difference in the level of purchases from one region to another. The number of households purchasing each beverage in each demographic category also is included in this treatment.

The demographic variables used in the analysis include poverty status, household size, age of female head, employment of female head, education of female head, race, region, Hispanic origin (ethnicity), and seasonality (data tables 15a and 15b). The beverage groupings to be analyzed in the cross-tabulations are shown in the box on page 21. To conform to space limitations, both aggregate groupings and disaggregated groupings of beverages are used rather than all 77 beverage products previously discussed.

A Look at Prices, Gallons, and Expenditures

The annual consumption (in gallons), expenditure (in dollars), and prices (dollars per gallon) for households who actually bought nonalcoholic beverages in 1999 are shown in data table 13. The statistics include a count of the number of households who purchased the nonalcoholic beverage in 1999, as well as the mean, median, standard deviation, minimum and maximum associated with gallons bought, prices paid, and expenditures made on nonalcoholic beverages.

To illustrate, 4,898 households bought bottled water; 5,304 bought tea; 5,584 bought coffee; 7,036 bought milk; and 7,041 bought carbonated soft drinks. These figures correspond to market penetration (the percent of respondents who actually consumed the beverage) of 68.1 percent for bottled water; 73.7 percent for tea; 77.6 percent for coffee; 97.8 percent for milk; and 97.9 percent for carbonated soft drinks. Carbonated beverages were the most popular beverage purchase by households and packaged tea was the least purchased item of the 77 product modules analyzed.

Average prices paid per gallon for bottled water were $1.99; tea $1.89; coffee, $1.38; milk, $3.08; and carbonated soft drinks, $2.45. The least expensive beverages for 1999 are powdered soft drinks, coffee, and tea; the most expensive nonalcoholic beverages are ready-to-drink fruit juices, vegetable juices, and isotonics.

Average annual quantities and expenditures for households who bought various nonalcoholic beverages are as follows: ready-to-drink fruit juices, 13.47 gallons ($60.35); ready-to-drink fruit drinks, 8.14 gallons ($27.29); isotonics, 3.58 gallons ($15.36); powdered soft drinks, 17.89 gallons ($14.14); vegetable juices and drinks, 2.29 gallons ($12.96); tea, 15.00 gallons ($18.58); coffee, 43.06 gallons ($42.81); carbonated soft drinks, 51.87 gallons ($121.19); bottled water, 14.32 gallons ($17.73); flavored milk, 2.32 gallons ($9.80); unflavored milk, 33.32 gallons ($90.78); frozen fruit juices, 6.77 gallons ($20.77); and frozen fruit drinks, 3.61 gallons ($9.63). The volume leaders in 1999 were carbonated soft drinks, coffee, and unflavored milk, in that order. Average expenditures are greatest for carbonated soft drinks, milk, ready-to-drink fruit juices, and coffee, in that order.

Poverty Status

Instead of using only the income demographic given in the ACNielsen Homescan data, a poverty threshold demographic also was calculated according to U.S. Census Bureau poverty specifications. Both income and household size were used for determining households below and above the poverty threshold. We are using 130 percent of poverty in this study because it is the cut-off level for food stamp eligibility and for free school meals. Analysis of the household income levels found that 423 of the 7,195 households fell into the below 130 percent of poverty range. The households above 130 percent of poverty purchased more orange juice, both frozen and not frozen (fig. 33, data table 16). Households below 130 percent of poverty purchased over 3 more gallons of powdered soft drinks a year and purchased over 7 more gallons of regular carbonated soft drinks per year when compared with households with incomes over 130 percent of poverty. Above 130 percent poverty households purchased more of the lower calorie soft drinks and over 4 more gallons of bottled water per year as compared with the households below 130 percent of poverty. Above poverty households also purchased more 2-percent, 1-percent, and skim milk, while households below 130 percent of poverty purchased more unflavored whole milk.

Household Size

The household size demographic has nine categories ranging from one household member to nine or more (fig. 34, data table 17) and includes average purchases by household size for those that bought. No household had more than nine members with the mean household size in the panel being 2.57 members. The largest category was the household size of two that had 2,704 observations of the 7,195 households in the data set.

As household size increases, purchases, on average, typically increase. This finding is largely due to the fact that the data deal primarily with food-at-home purchases. As family size increases, the household is less apt to dine out or eat away from home for budgetary reasons. Every beverage listed is consumed in greater amounts in households with two or more persons compared with single-person households. The exception to this observation was frozen fruit drinks. Single-person households are either eating more on the go or away from home than multi-person households. As household size increases, powdered soft drinks, milk, and carbonated soft drinks are more heavily consumed at home.

Female Head of Household

Three demographics concerning the female head of household-age, employment status, and education level-were looked at next. It is assumed that the female head is largely responsible for food-at-home purchases. Six hundred seventy-one of the households had no female head of household or the household gave no information regarding age, employment, or education of a female head.

Age of Female Head of Household

There are eight categories of age for female head of households (fig. 35, data table 18). Households with the female head under 25 years old bought more powdered soft drinks than did all remaining households with female heads that are older. Households with older female heads bought considerably more coffee than did households with younger female heads. Coffee purchases ranged from 15.55 gallons for households with female heads under age 25, to 50.82 gallons for households with female heads older than 65. Carbonated soft drink purchases for households with female heads ages 40-44 was the highest level, 68.92 gallons. This figure is 17.05 gallons above the overall average of all households in the surveyed panel. Milk purchases also varied for any age of female-headed households starting at 42.19 gallons for those under 25 and then dropping to 31.19 gallons for those in the 25-29 bracket. From this level it slowly increased until the female head turned 45, then the average household purchase of milk decreased thereafter.

Employment of Female Head of Household

There are four categories of employment, ranging from not employed to three different categories of hours worked per week (fig. 36, data table 19). The majority of the beverage consumption changes little from one classification to the next. One notable difference is the purchase of tea for households where the female head worked 35-plus hours. The average purchase is 2 gallons less than households with different-aged female heads. Households with unemployed female heads bought more coffee for at-home consumption than did households with employed female heads. The average consumption is 49.46 gallons per year for unemployed female heads. The unemployed and fully employed female-head households bought less carbonated soft drinks on average than female heads who work part-time. Lastly, households that contain a female head who works fewer than 30 hours per week bought more milk on average than did other households, purchasing 40.7 gallons per year.

Education of Female Head of Household

There are six categories for education ranging from grade school education to post-college education (fig. 37, data table 20). There were 2,187 of the households in the data set, including a female head that attained some college education, followed by 1,821 households where the female head had graduated from college. Households with higher educated female heads bought more apple juice, orange juice, and other fruit juices than did households with less educated female heads. The average purchase of juices gradually increased as the education level of the female head rose. Conversely, powdered soft drink purchases per household decreased as education level increased, ranging from 20 gallons for households where the female head had some high school education to 15 gallons for households of female heads that attained a post-college education. Coffee and carbonated soft drink purchases decreased for households where the female heads in the households were more educated, similar to powdered soft drinks. This finding also was true for milk; purchases in households decreased as the education level of the female head in those households rose.

Race

The demographic for race had four categories: White, Black, Asian, and Other (fig. 38, data table 21). In the panel data, 83.5 percent of the households were White. Asian households bought more ready-to-drink fruit juices and orange juice than households of other race classifications did. Consuming only 27.96 gallons of carbonated soft drinks per year, Asian households drank substantially fewer gallons when compared with White and Black households, who consumed 54.14 gallons and 35.51 gallons, respectively, on average per year. Black households bought more powdered soft drinks and ready-to-drink fruit drinks and less tea than did households of other races. White households purchased the greatest amount of coffee per year, 45.1 gallons compared with other races. White households also purchased the largest amounts of milk, but less bottled water on average than did households of different races.

Region

Four regions were studied: East, Central, South, and West (fig. 39, data table 22). Households located in the East bought more ready-to-drink fruit juices, orange juice, tea, and coffee than did households from other regions. Households located in the East and South purchased the least milk of any region, at about 32 gallons per year per household. Households located in the Central region bought more milk, carbonated soft drinks, and powdered soft drinks than did other household regions on average. Southern households purchased high levels of powdered soft drinks, though slightly less than did Central region households. Southern households also bought high levels of carbonated soft drinks. Households located in the West purchased more gallons of bottled water per year than did households located in other regions. Western households bought less orange juice and tea than did households from other regions.

Hispanic Origin (Ethnicity)

The data indicated that 457 of the 7,195 households in the panel were of Hispanic origin (fig. 40, data table 23). Hispanic households bought more ready-to-drink fruit drinks, powdered soft drinks, carbonated soft drinks, bottled water, and milk than did households that were not Hispanic. Hispanic households purchased less tea and coffee than non-Hispanic households. Hispanics purchased more milk overall than non-Hispanic households, with the majority of that milk being "whole" and 2-percent milk. Non-Hispanic households purchased more 1 percent and skim milk in contrast to Hispanic ones. Households of Hispanic origin bought more frozen concentrated orange juice than did non-Hispanic households.

Seasonality

The purchases of nonalcoholic beverages in the data set allowed seasonality to be analyzed (fig. 41, data table 24). Overall, the number of households that bought nonalcoholic beverages during all four quarters in 1999 and the average purchases of each nonalcoholic beverage were relatively stable. The purchases of carbonated soft drinks were slightly higher during the second and third quarter (the warmer months) than in other quarters. Milk purchases decreased slightly in the third and fourth quarters, relative to other quarters of the year. Coffee purchases were greatest in the fourth quarter (the holiday months) at 15.25 gallons, relative to other quarters of the year. Powdered soft drink purchases were the most seasonal beverage, with the number of households purchasing powdered soft drinks almost double for the second and third quarters, which includes the summer months when children are out of school.

Conclusions

Our findings demonstrate that household beverage choice can have an important impact on the nutritional quality of the household food supply. The beverage choices a household makes have important effects on household calories, an important consideration given America's current obesity problem. Beverage choices also impact calcium availability in the home food supply, another major public health concern.

Limitations of the data used for this study must be noted. For example, food purchasing is not equivalent to food consumption. Some purchased items may be wasted—milk may spoil and be discarded uneaten, for example—and some items may be consumed by non-household members (guests). But, it is reasonable to assume that household food purchases will be strongly correlated with consumption, and can be considered proxies for the quantity of the foods and beverages consumed from the at-home food supply.

For most Americans, the at-home food supply provides the larger part of their diet, but food prepared away from home—i.e., restaurant, fast-food, and take-out foods—plays a much more important role in today's diet than in previous decades. In 1977-78, foods from the home food supply made up 82 percent of Americans' daily diets (as measured in calories consumed). By 1995, the share of diet obtained from the home food supply had dropped to 66 percent. Given this shift, it is useful to consider how the beverage choices Americans make away from home might complement their at-home choices.

Our analysis indicates more households purchased soft drinks than milk. Lin et al. also have found that the calcium density of food obtained from restaurant and fast-food sources is lower than the calcium density of food from the home food supply. Since milk is the major source of calcium in American diets, this indicates that milk consumption away from home is likely even lower than from home foods. The only exception is foods obtained by children at schools and day care, where USDA regulations require that meals served as part of the Federal School Meal Programs must contain milk. Clearly, USDA meal programs can play an important role in improving calcium adequacy of the diets of participating children.

Our study reinforces the need for dietary guidance on beverage choice. In addition, the differences in beverage purchases we found to be associated with particular household characteristics have implications for content and targeting of nutrition education messages. Current USDA dietary guidance publications include advice on beverage choices—for example, the Food Guide Pyramid for Children recommends two servings from the milk group daily, and includes a picture of a soft drink in the tip of the Pyramid, indicating they should play an occasional role in the diet. Purchasing habits of lower income households are of particular concern, given USDA's substantial investment in Food Stamp Nutrition Education.

These data were collected in 1999. Since then changes in dietary guidance—most notably the 2000 and 2005 revisions of the Dietary Guidelines for Americans—have created an increased emphasis on beverage choice as a nutrition education message. In 2000, the Dietary Guidelines message on sugars was changed from “Choose a diet moderate in sugars” to “Choose beverages and foods to moderate your intake of sugars.” The committee altered the wording of the guidelines to emphasize beverages because soft drinks and fruit-flavored beverages were found to be the No. 1 and No. 3 most important sources of added sugars in American diets. The 2000 Dietary Guidelines also emphasized the need for improving American’s calcium intakes and identified both milk and calcium-fortified fruit juice as recommended sources. This advice was reiterated in the 2005 Dietary Guidelines, which encourage consumption of 3 cups of fat-free or low-fat milk daily, while limiting intake of beverages with added sugars and sweeteners. These data can be considered a baseline for future studies investigating effects of the Dietary Guidelines’ increased emphasis on beverage choices.

Perhaps in response to these new nutrition education emphases, there have been important changes in the beverages available for purchase since these data were collected. Calcium fortification of juices has become increasingly common. New beverage products such as drinkable yogurt have been introduced. These changes in the marketplace may have important effects on the nutrient contribution of beverages to the household food supply. As newer data become available, it will be interesting to assess the impact of dietary guidance on the beverage marketplace and consumer beverage choices.

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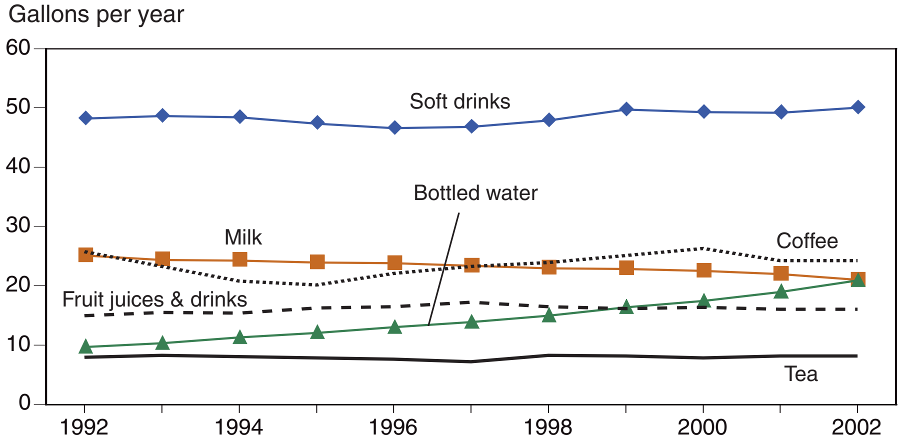
Figure 1

Per capita U.S. nonalcoholic beverage consumption, 1992-2002



Source: Economic Research Service, USDA.

Figure 2

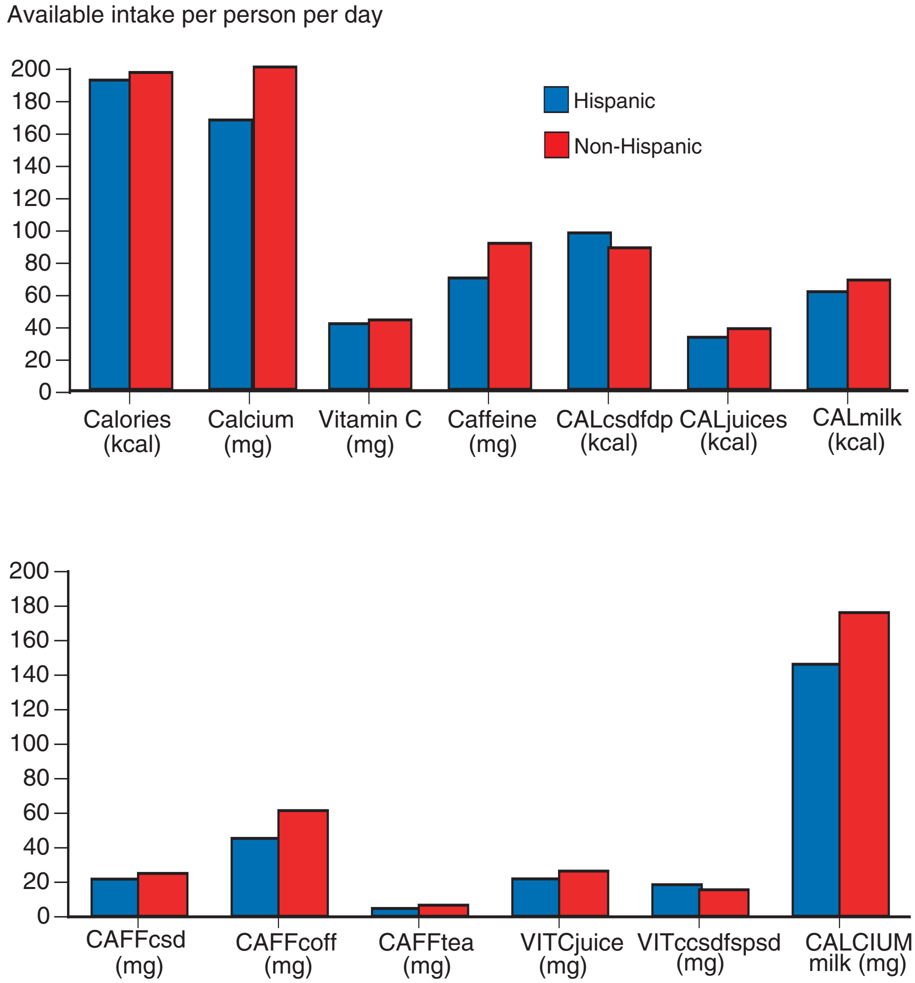
Comparison of nonalcoholic beverage consumption data

	Total U.S. consumption (ERS/USDA)	Consumption at home (ACNielsen)	Nonalcoholic beverage consumption at home
	-------- *Gallons/person*	*---------*	*Percent*
Soft drinks	50.8	20.2	39.8
Milk	23.6	13.2	55.9
Bottled water	18.1	5.6	30.9
Fruit juices	9.6	7.9	82.3
Coffee	25.7	16.8	65.4
Tea	8.4	5.8	69.0

Source: ERS analysis of ACNielsen Homescan data, ERS data.

Figure 3

Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by ethnicity*



* See definitions of abbreviations in table 2 footnotes for all figures.
Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 4

Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by region*

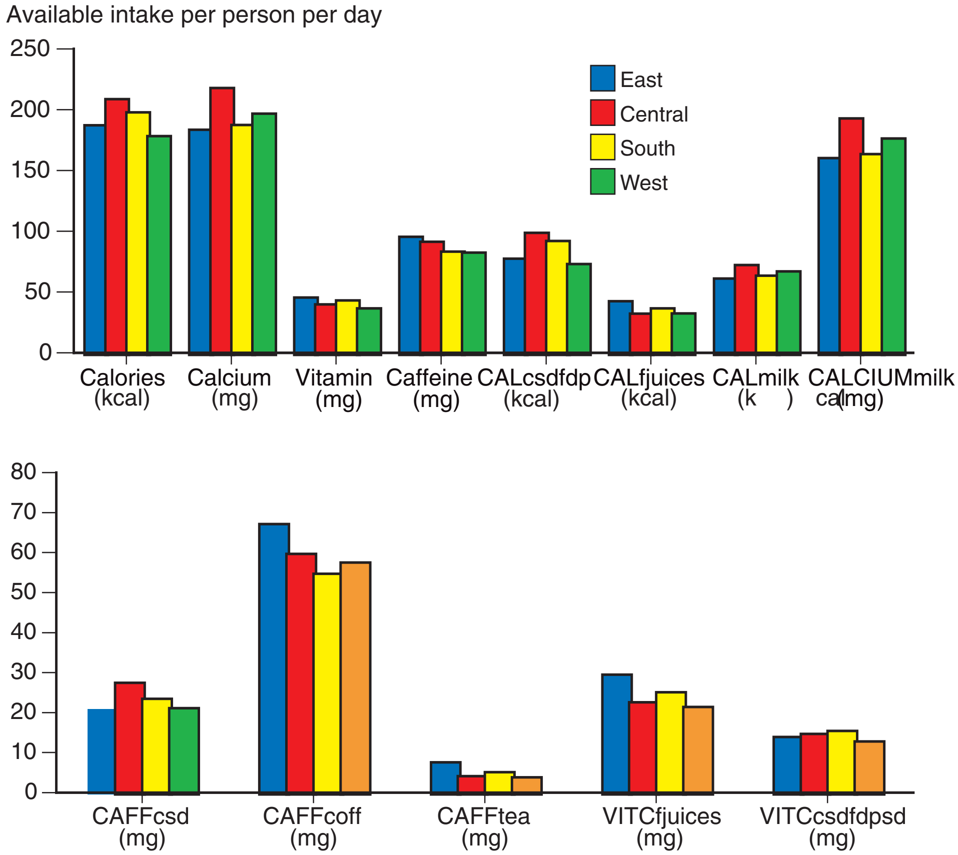
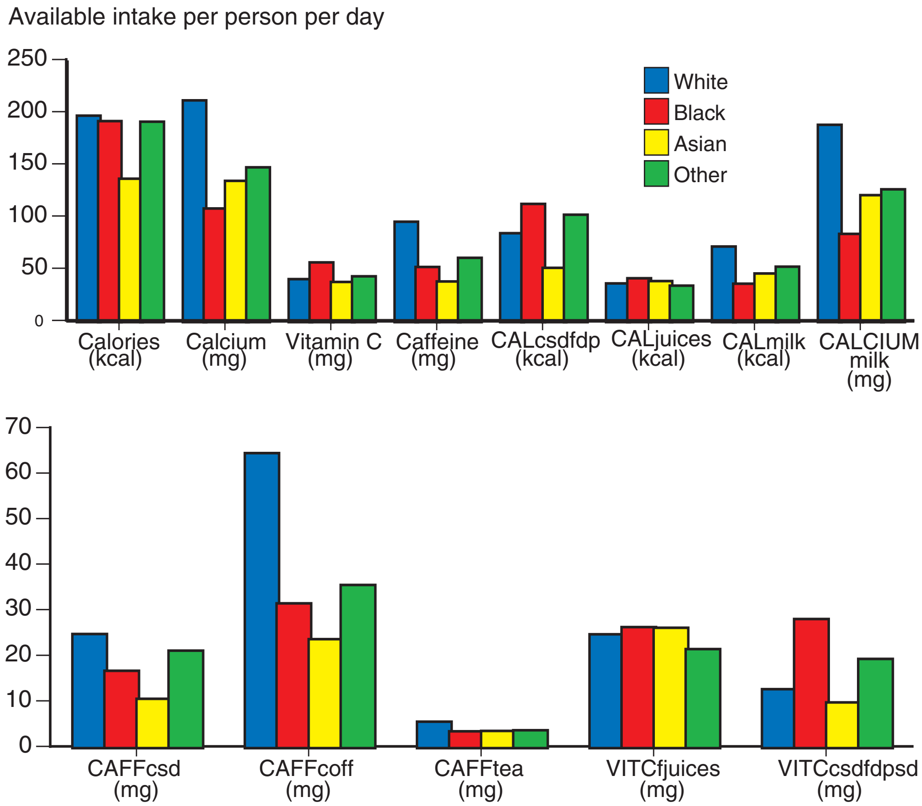


Figure 5

Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by race*

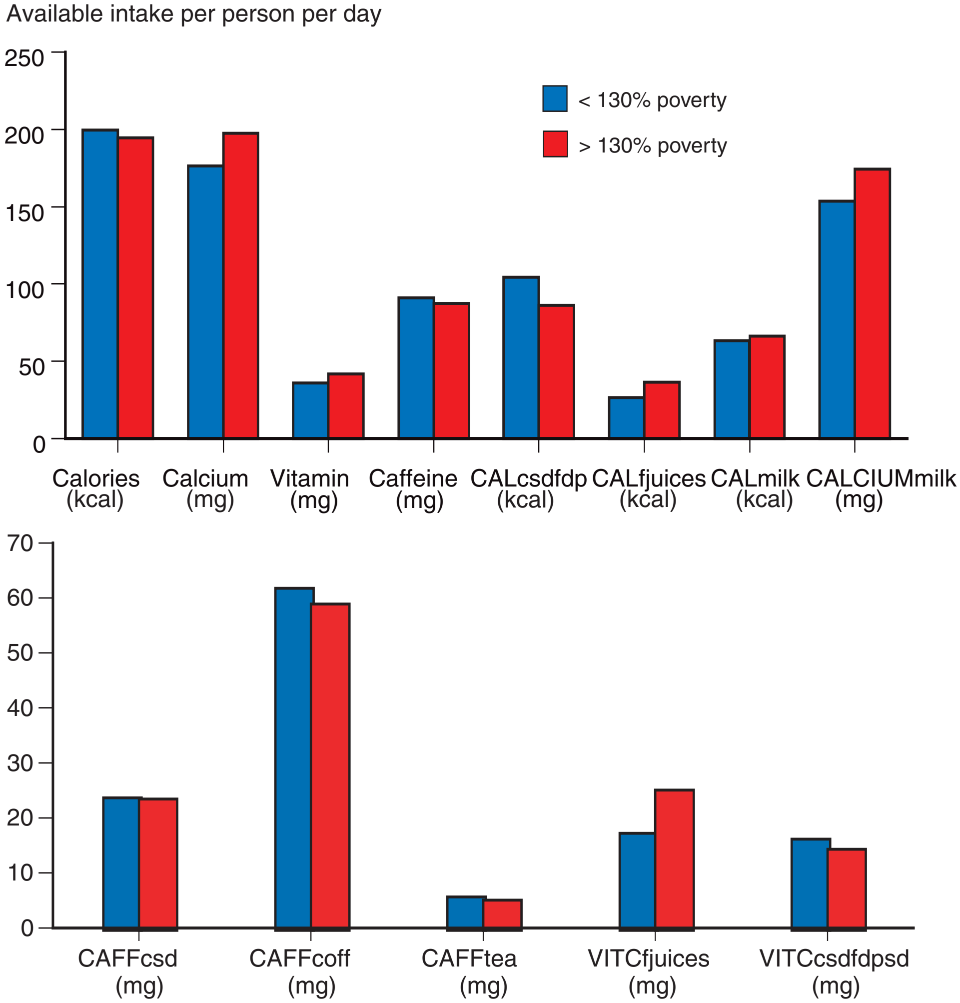


* See definitions of abbreviations in table 2 footnotes for all figures.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 6

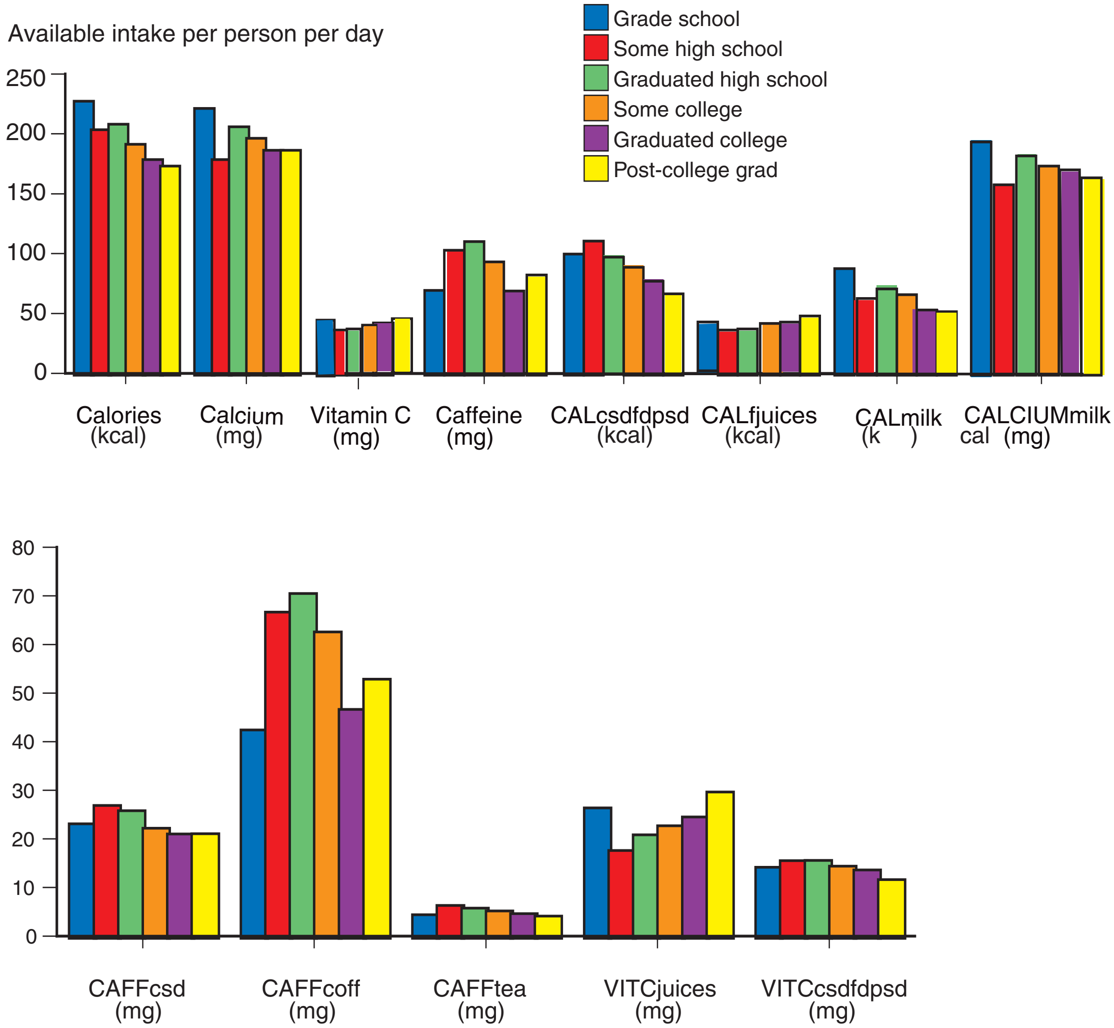
Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by poverty status*



* See definitions of abbreviations in table 2 footnotes for all figures.
Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 7

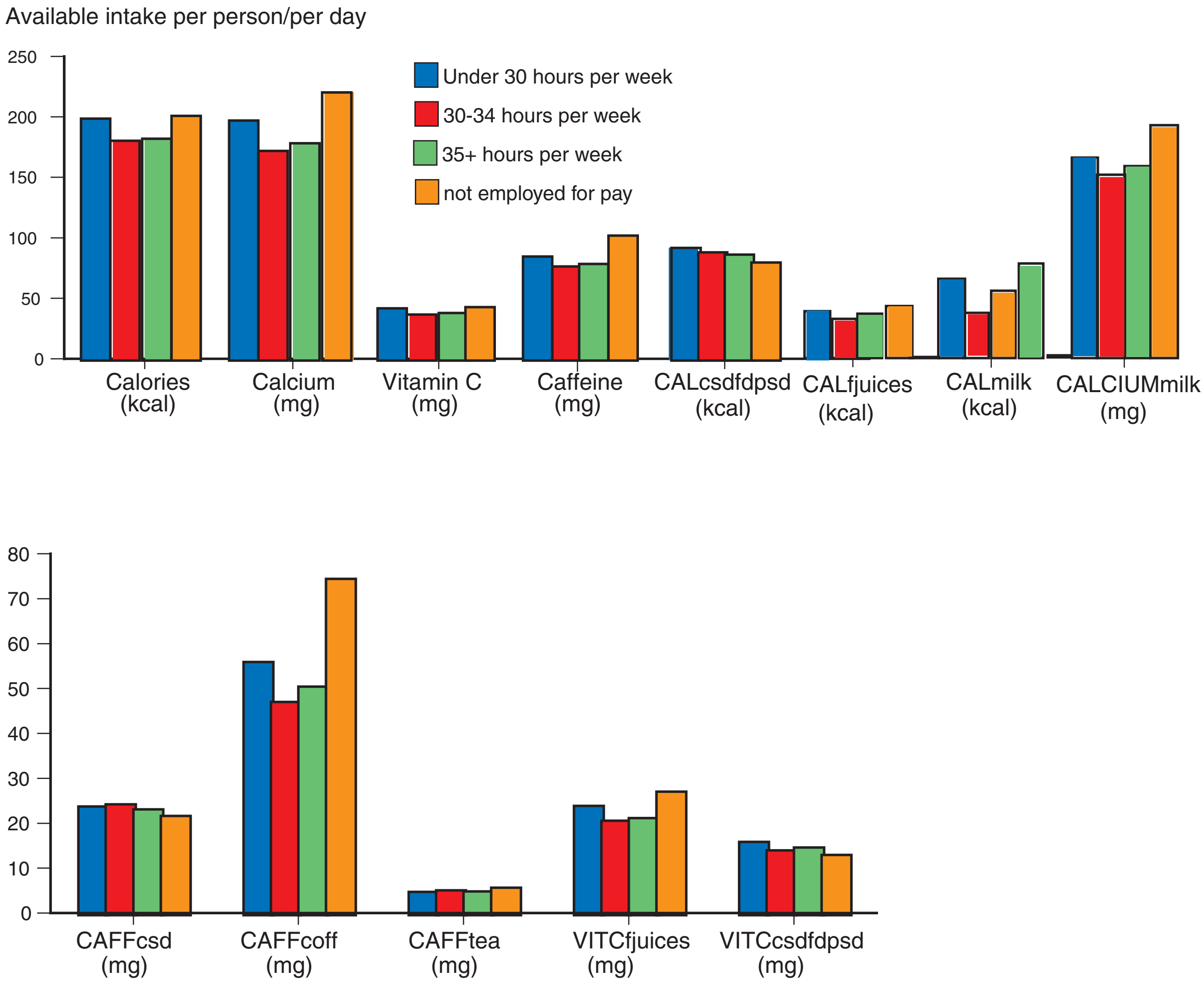
Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by education of female head of household*



* See definitions of abbreviations in table 2 footnotes for all figures.
Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 8

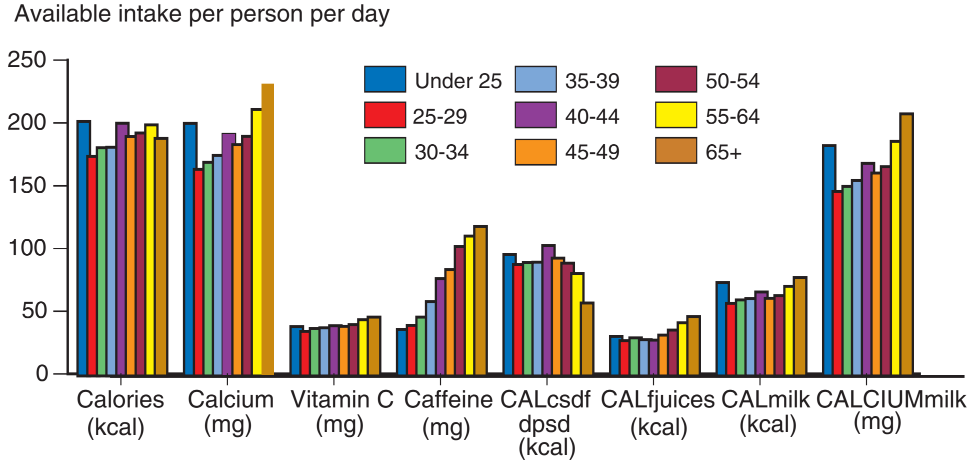
Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by employment of the female head*

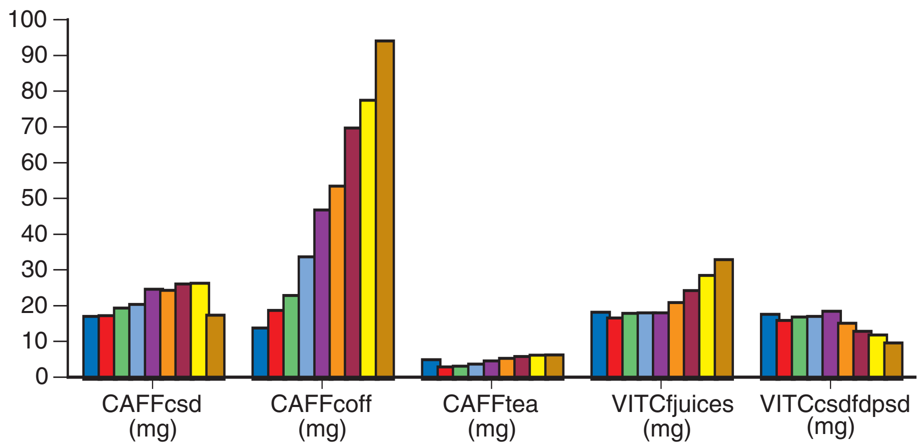


* See definitions of abbreviations in table 2 footnotes for all figures.
Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 9

Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by age of the female head*

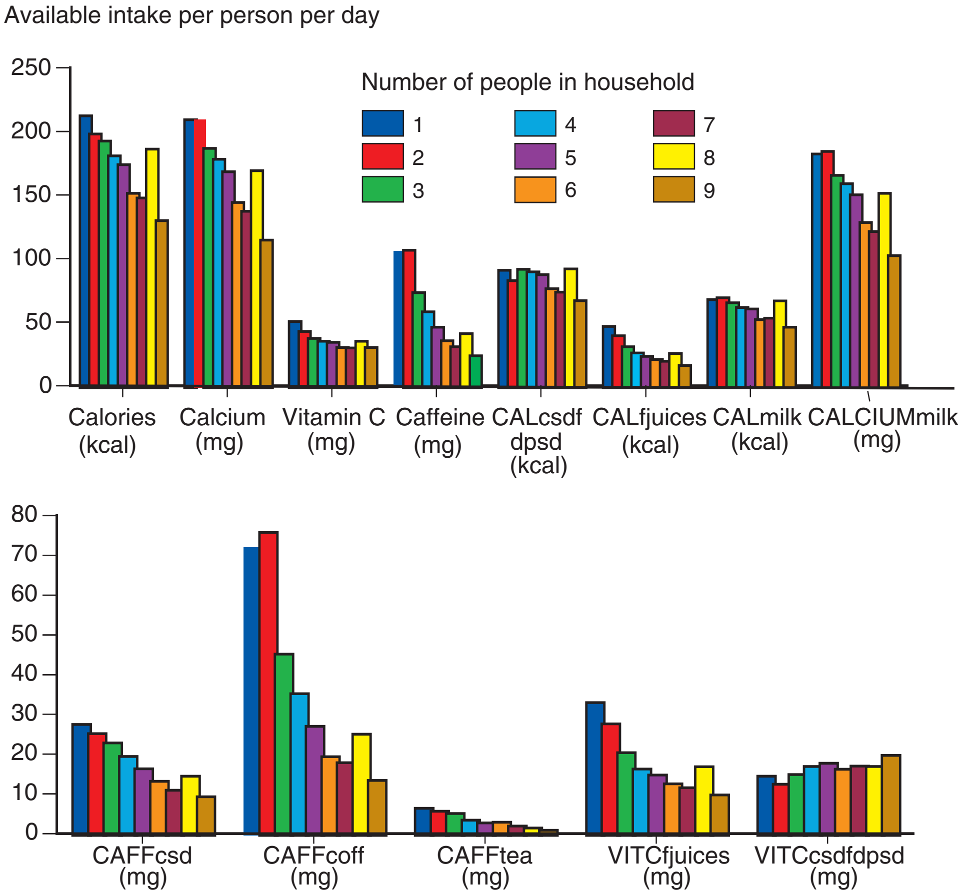




* See definitions of abbreviations in table 2 footnotes for all figures.
Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 10

Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by household size*



* See definitions of abbreviations in table 2 footnotes for all figures.
Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 11a

Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by presence of children*

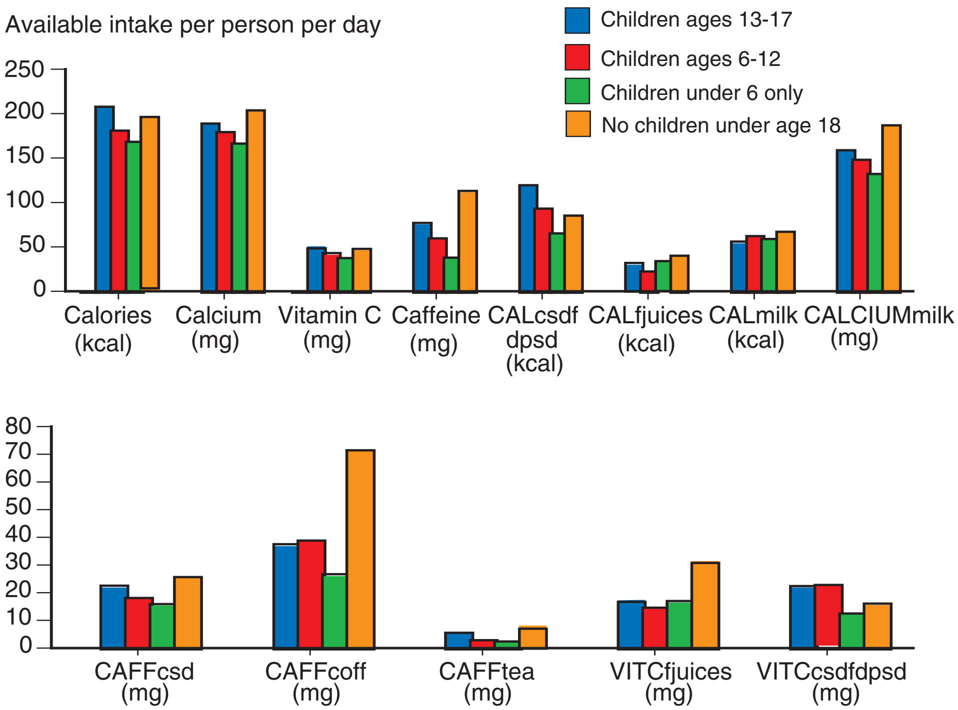
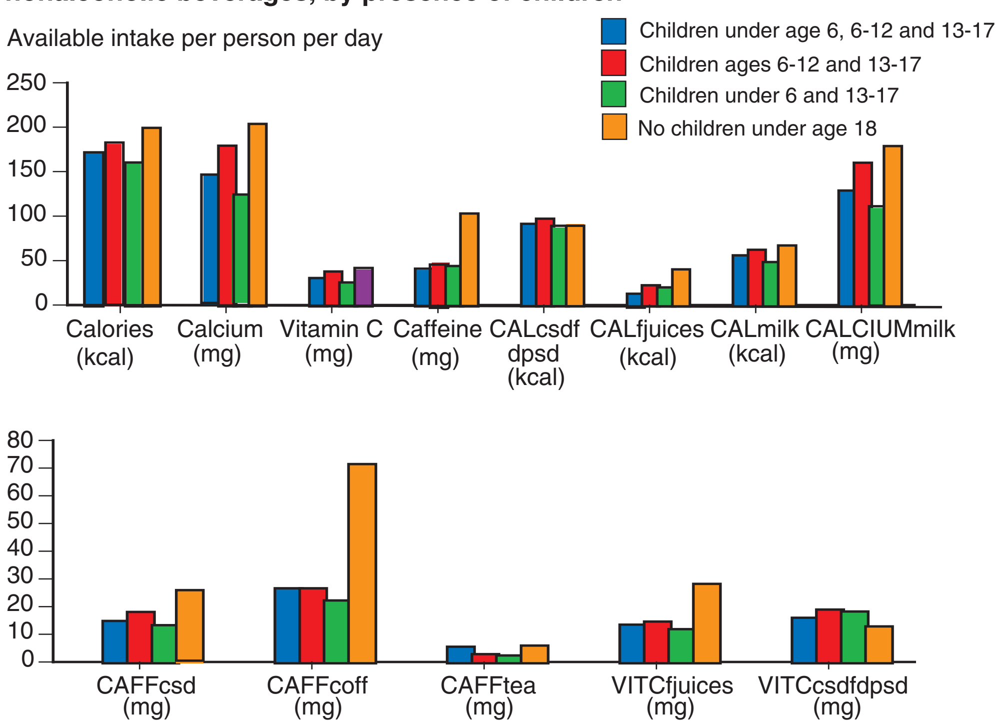


Figure 11b

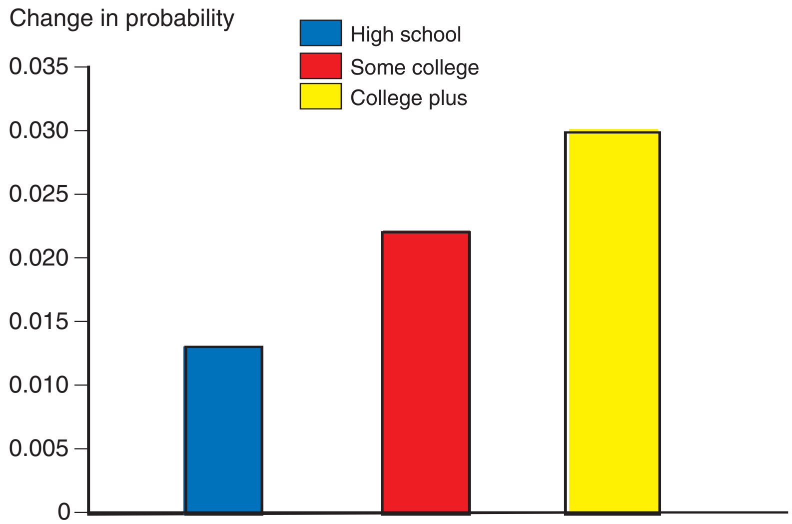
Average caloric, calcium, vitamin C, and caffeine availability from all nonalcoholic beverages, by presence of children*



*See definitions of abbreviations in table 2 footnotes for all figures.
Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 12

Marginal effects for ready-to-drink fruit juices not frozen, by education of household head

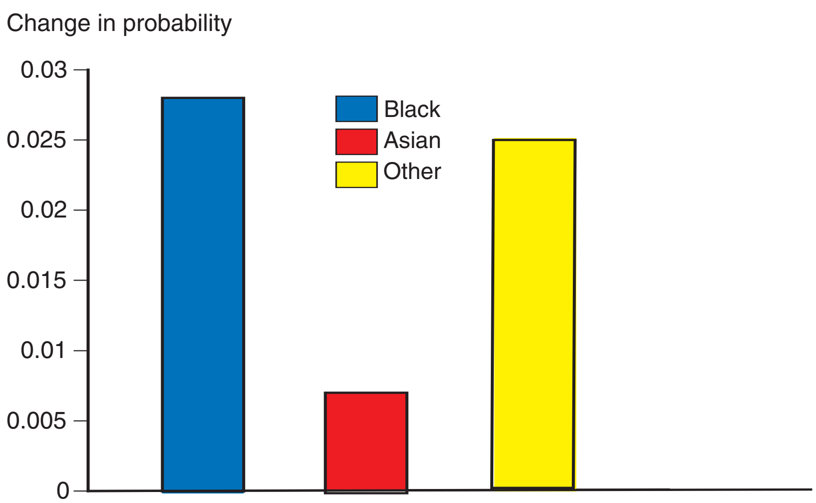


Note: The base category for this figure is a household head with less than a high school education. Households heads with more educaton than high school are more likely to purchase ready-to-drink (RTD) fruit juices.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 13

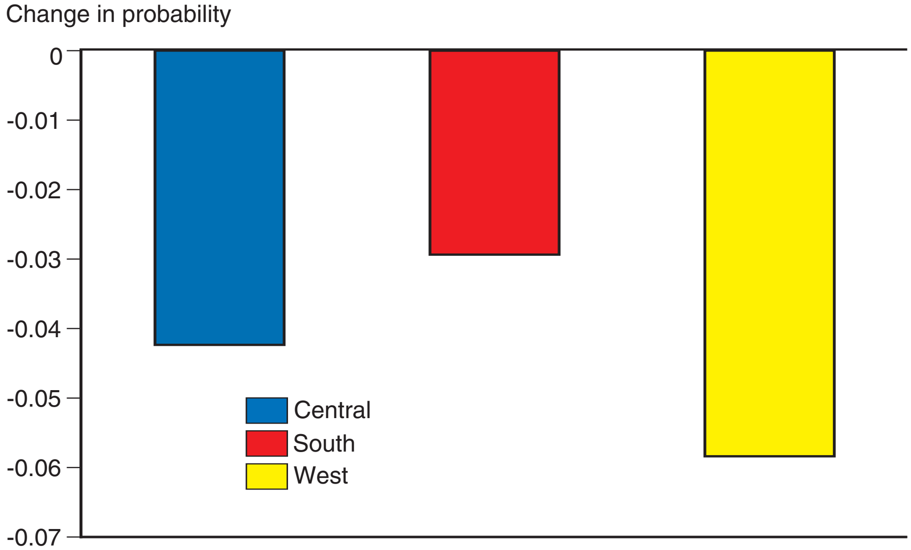
Marginal effects for ready-to-drink fruit juices not frozen, by race



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 14

Marginal effects for ready-to-drink fruit juices not frozen, by region

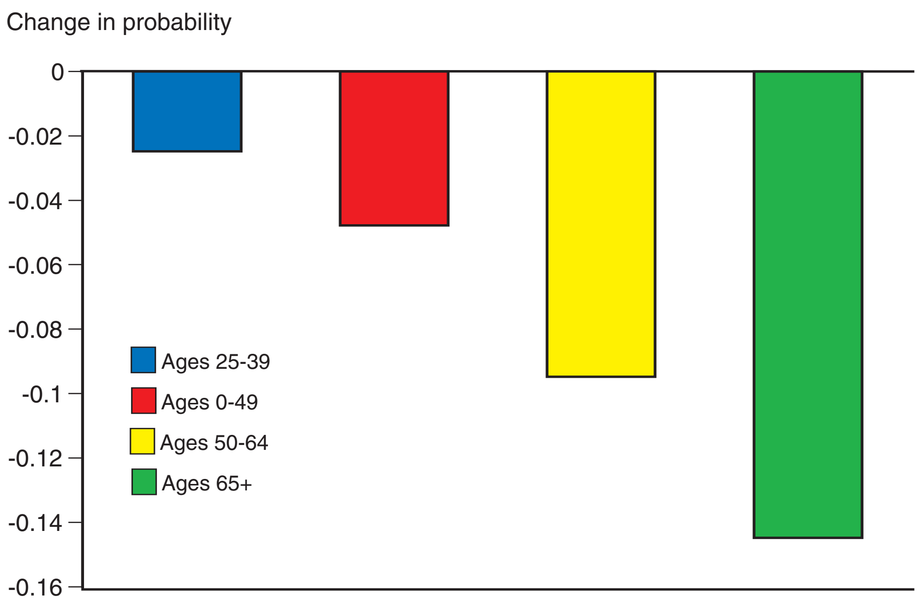


Note: The base category for this figure is the East region. Households located in regions other than East are less likely to purchase a ready-to-drink (RTD) fruit juice.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 15

Marginal effects for ready-to-drink fruit drink, by age of household head

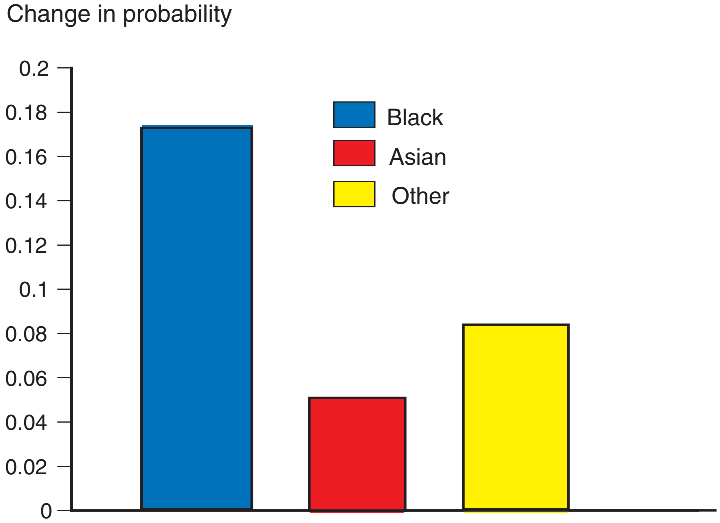


Note: The base category for this figure is a household head less than 25 years of age. Households heads older than 25 are less likely to purchase a ready-to-drink fruit drink.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 16

Marginal effects for ready-to-drink fruit drinks, by race

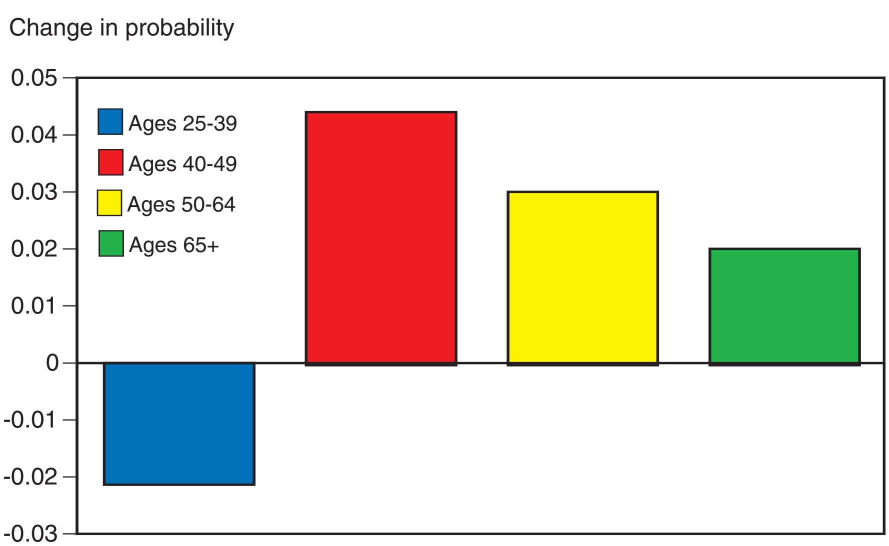


Note: The base category for this figure is White. Households other than Whites are more likely to purchase a ready-to-drink fruit drink.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 17

Marginal effects for tea, by age of household head

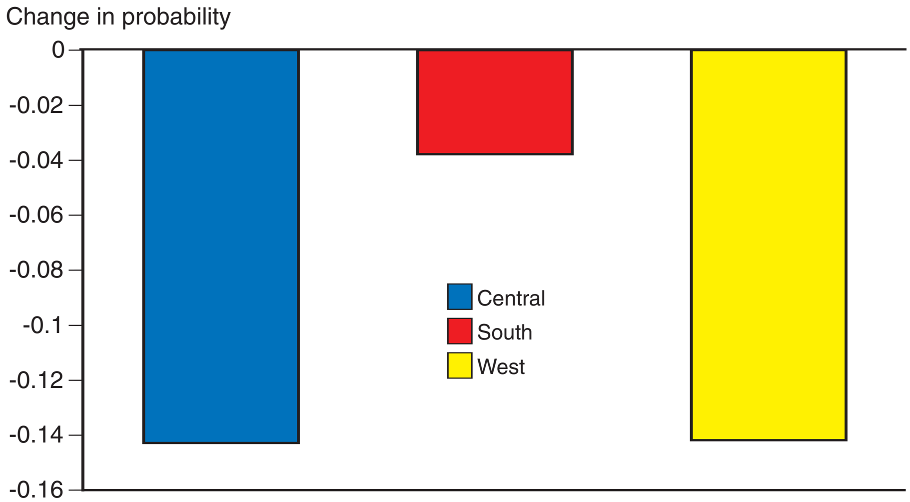


Note: The base category for this figure is a household head less than 25 years of age. Households with heads between 25 and 39 years old are are less likely to purchase tea. Households with heads older than 39 years old are more likely to purchase tea.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 18

Marginal effects for tea, by region

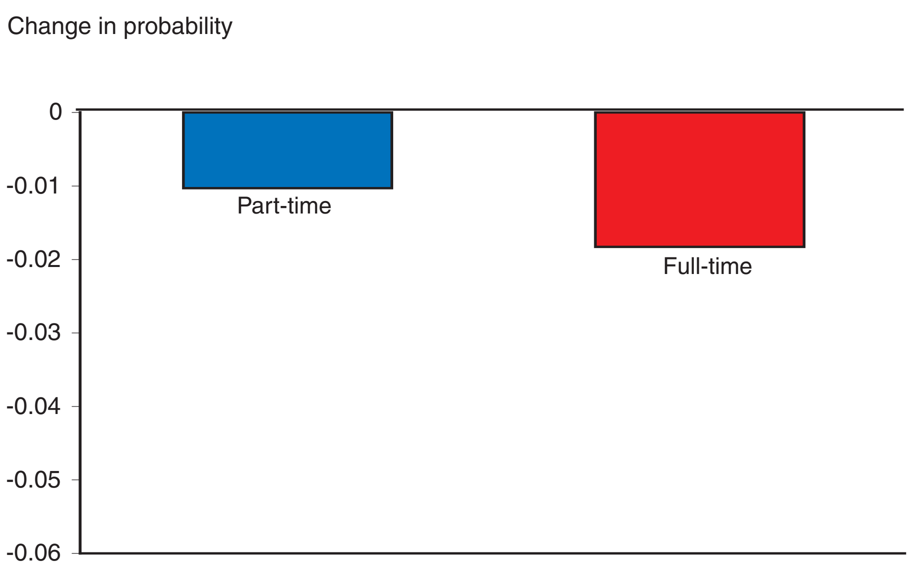


Note: The base category for this figure is the East region. Households located in regions other than the East are less likely to purchase tea.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 19

Marginal effects for coffee, by employment of household head

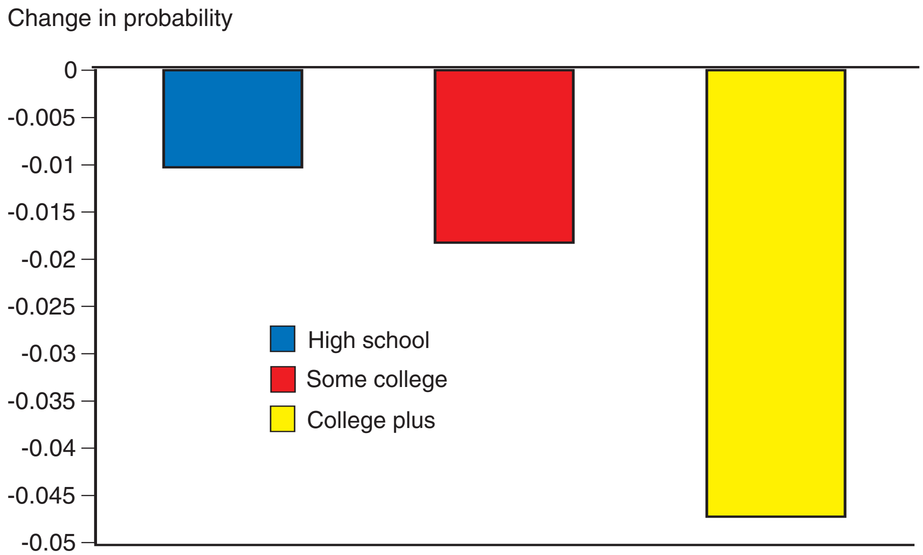


Note: The base category for this figure is a household head who is not employed. Households with employed heads are less likely to purchase coffee.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 20

Marginal effects for coffee, by education of household head

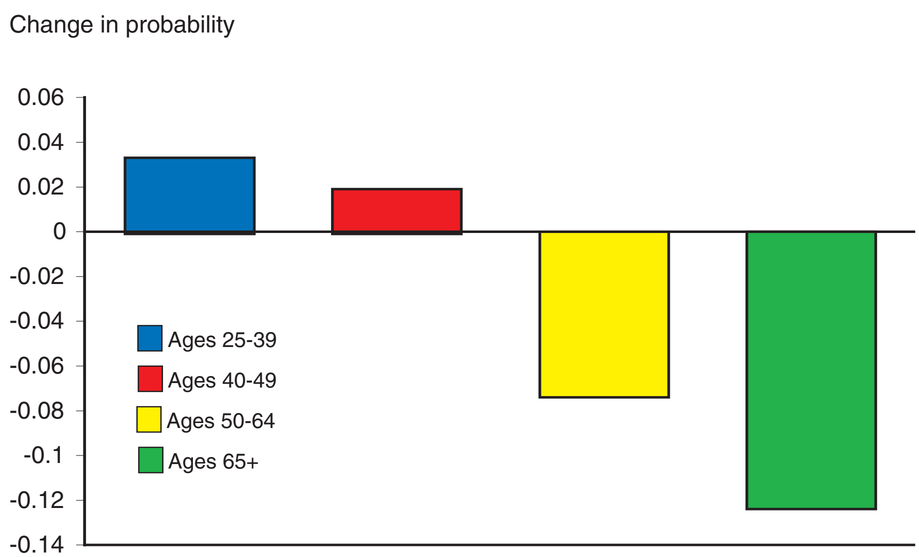


Note: The base category for this figure is a household head with less than a high-school education. Household heads with more education than high school are less likely to purchase coffee for at-home consumption.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 21

Marginal effects for isotonics, by age of household head

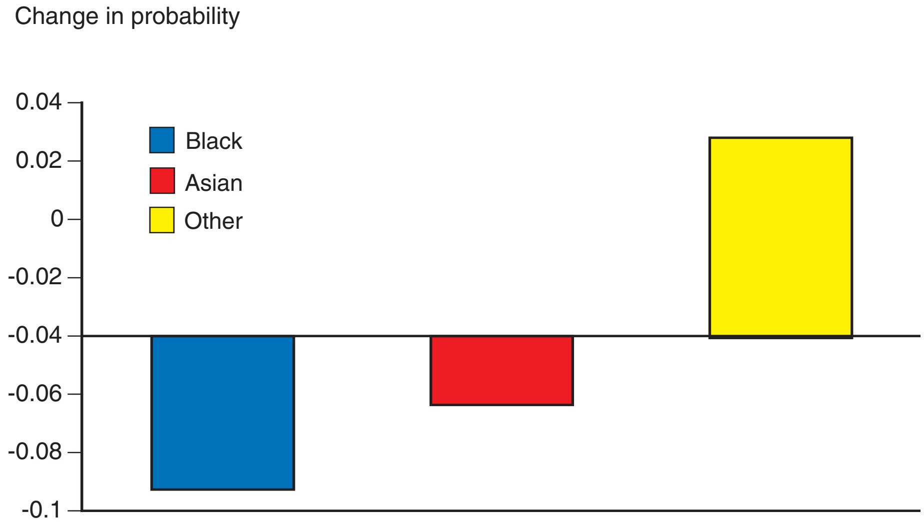


Note: The base category for this figure is a household head less than 25 years old. Households with heads between 25 and 40 years old are more likely to purchase isotonics. Households with heads ages 50 and older are less likely to purchase isotonics.

Source: Economic Research Service, USDA, analysis of ACNielsen HomeSscan data.

Figure 22

Marginal effects for isotonics, by race

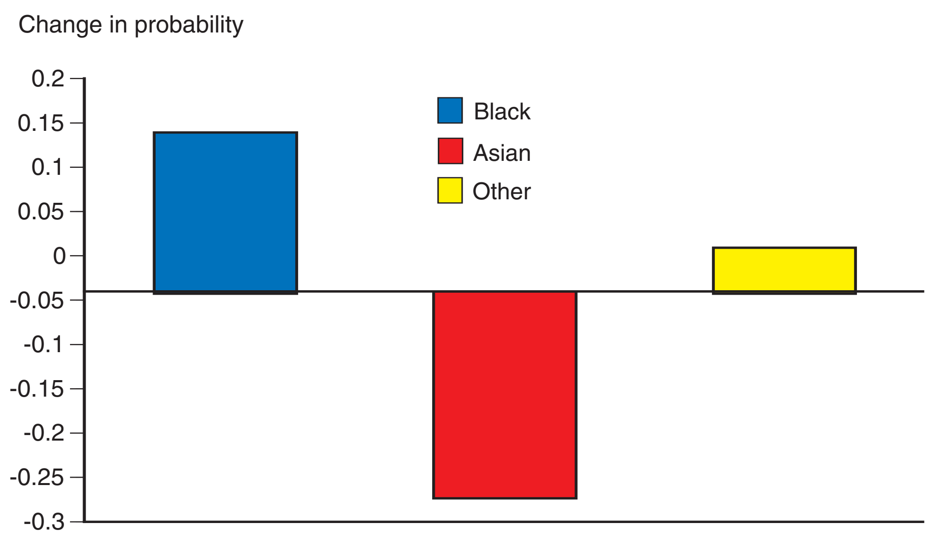


Note: The base category for this figure is White. Other (non-White, non-Black, non-Asian) households are more likely to purchase isotonics than Whites, while Black and Asian households are less likely to purchase isotonics than White households are.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 23

Marginal effects for powdered soft drinks, by race



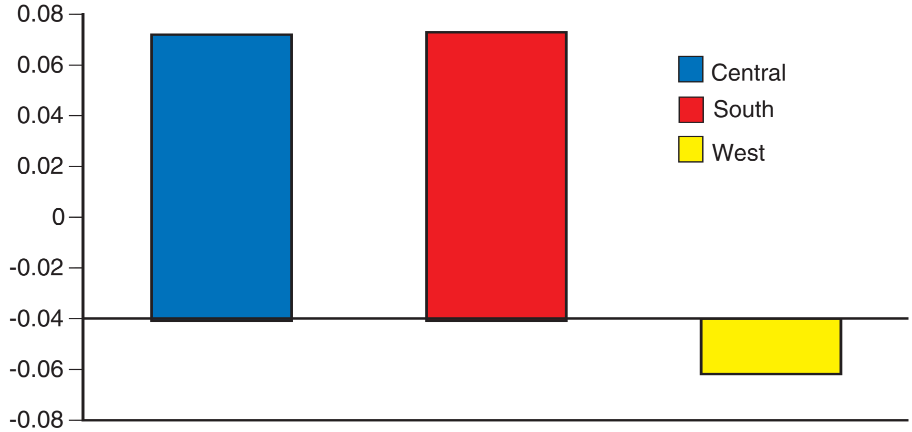
Note: The base category for this figure is White. Black households are more likely to purchase powdered soft drinks than White households are. Asians are less likely to purchase powdered soft drinks than Whites.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 24

Marginal effects for powdered soft drinks, by region

Change in probability



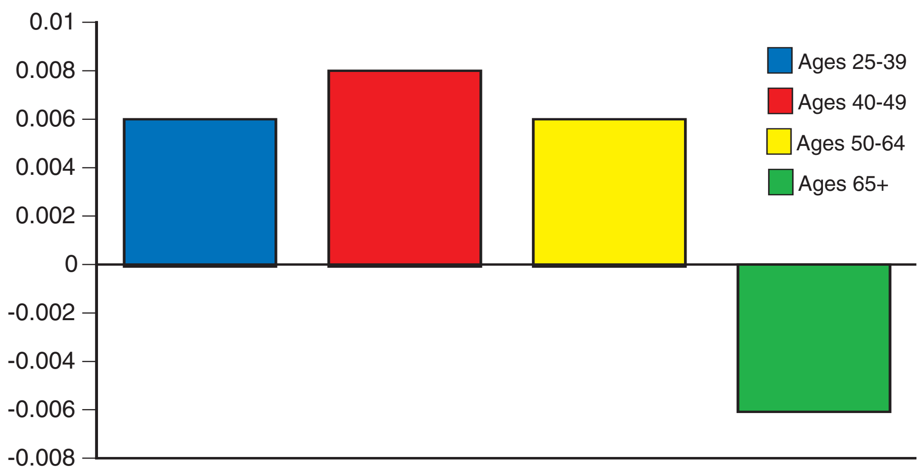
Note: The base category for this figure is the East region. Households in the Central and South regions are more likely to pruchase powdered soft drinks. Households located in the West are less likely to purchase powdered soft drinks, compared with households located in the East.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 25

Marginal effects for carbonated soft drinks, by age of household head

Change in probability

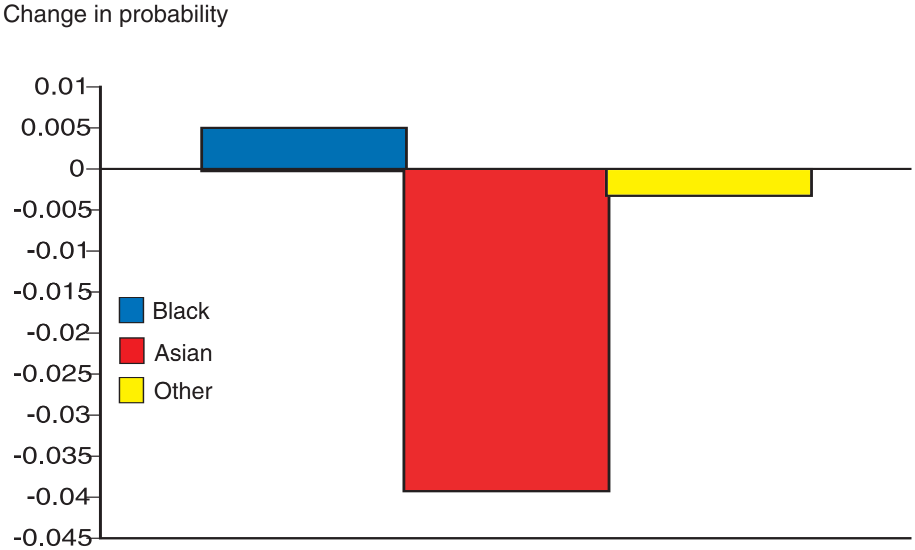


Note: The base category for this figure is a household head less than 25 years of age. Households heads aged 25-64 are more likely to purchase carbonated soft drinks. Households heads older than 64 are less likesly to purchase carbonated soft drinks.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 26

Marginal effects for carbonated soft drinks, by race

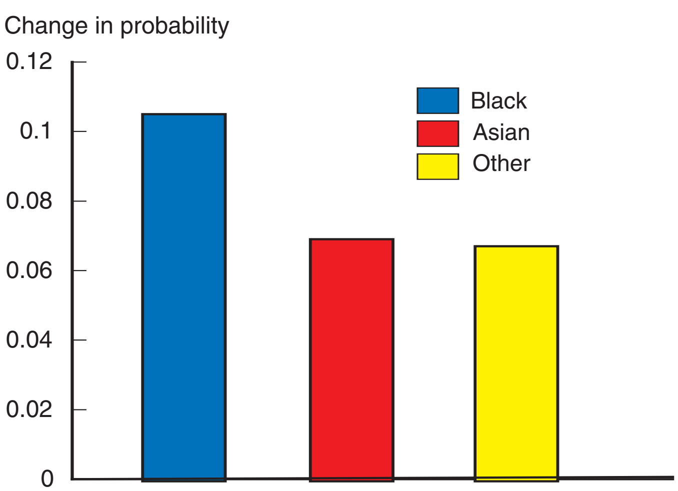


Note: The base category for this figure is White. Black households are more likely to purchase carbonated soft drinks than Whites, while Asian and Other races are less likely to do so.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 27

Marginal effects for bottled water, by race



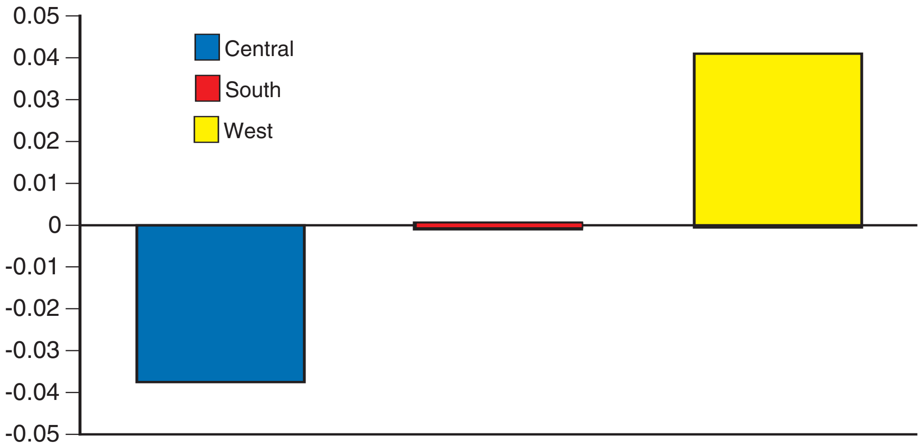
Note: The base category for this figure is White. Black, Asian, and Other households are more likelty to purchase bottled water than White households.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 28

Marginal effects for bottled water, by region

Change in probability



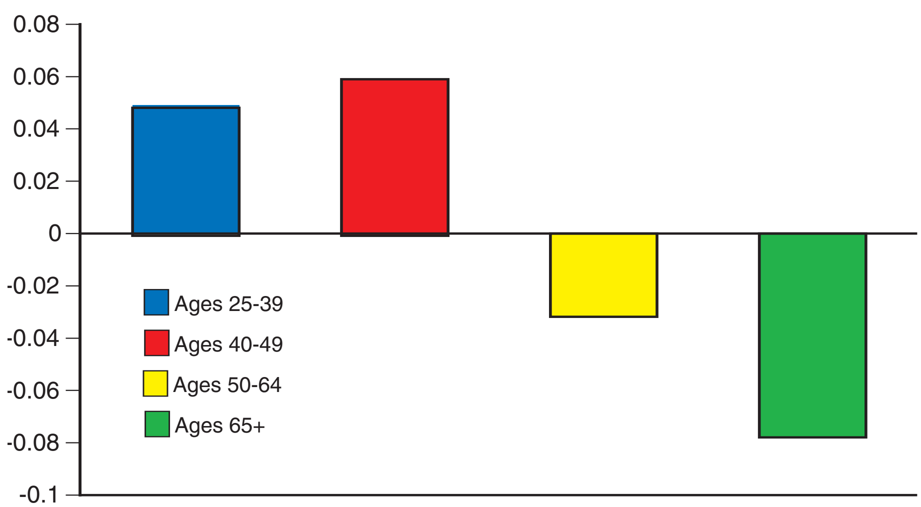
Note: The base category for this figure is the East region. Households located in the Central region are less likely to purchase bottled water, while households located in the West region are more likely to purchase bottled water.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 29

Marginal effects for flavored milk, by age of household head

Change in probability

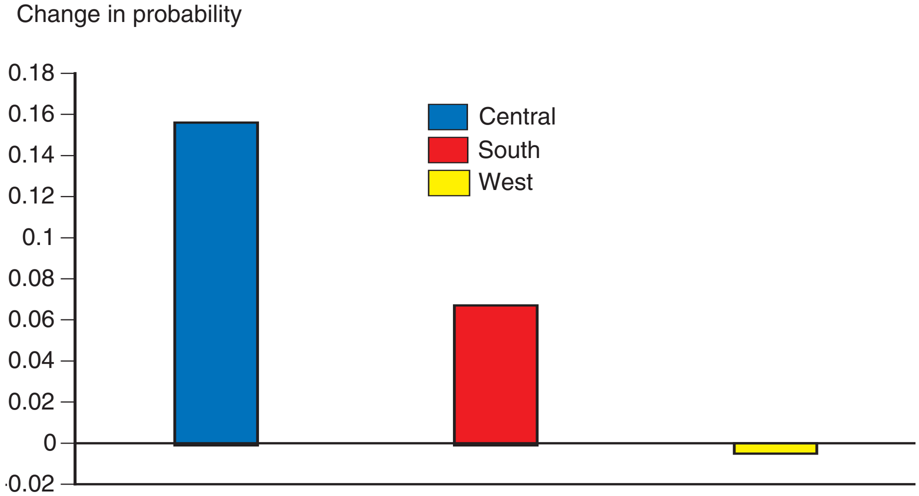


Note: The base category for this figure is a household head less than 25 years of age. Households heads older than 49 are less likely to purchase flavored milk.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 30

Marginal effects for flavored milk, by region

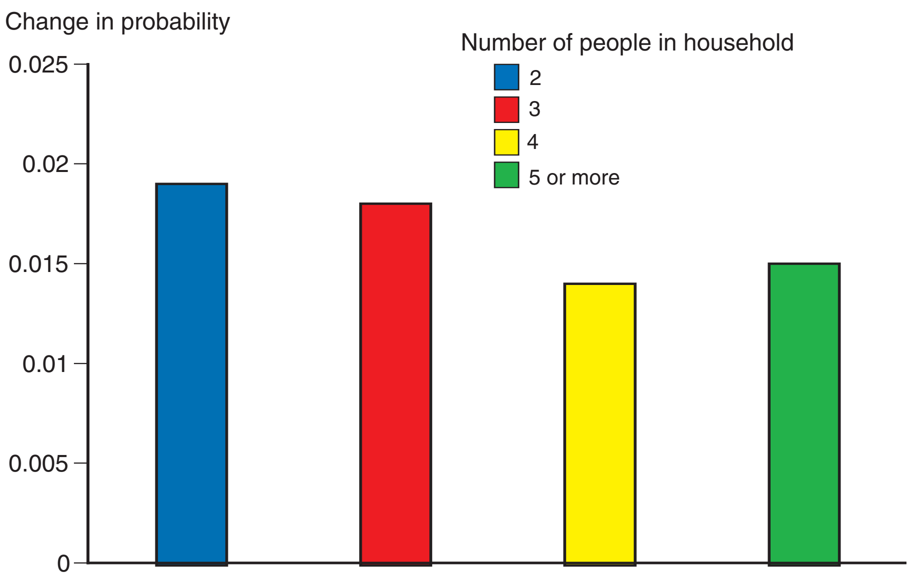


Note: The base category for this figure is the East region. Households located in the Central and South regions are more likely to purchase flavored milk. Households located in the West are less likely to purchase flavored milk compared with the East.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 31

Marginal effects for unflavored milk, by household size

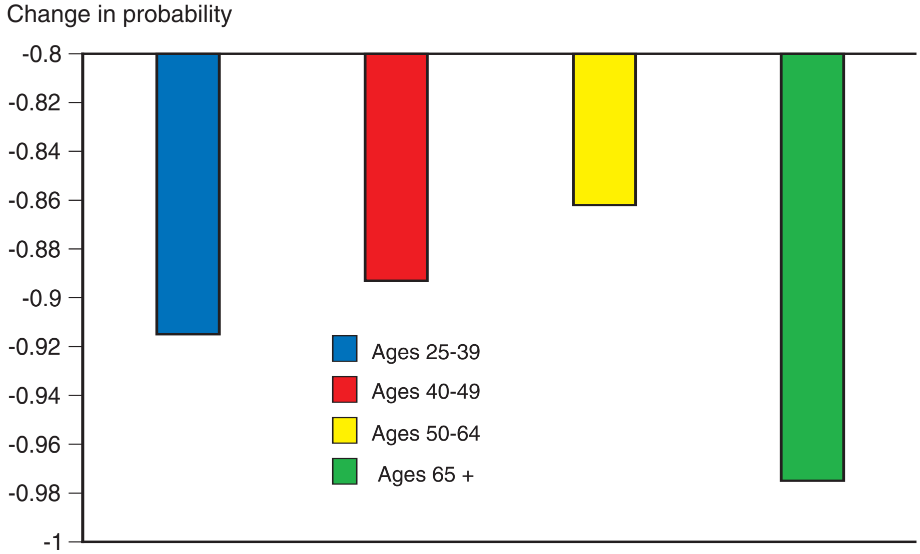


Note: The base category for this figure is a household of one. Households with more than one household member are more likely to purchase unflavored milk.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 32

Marginal effects for unflavored milk, by age of household head

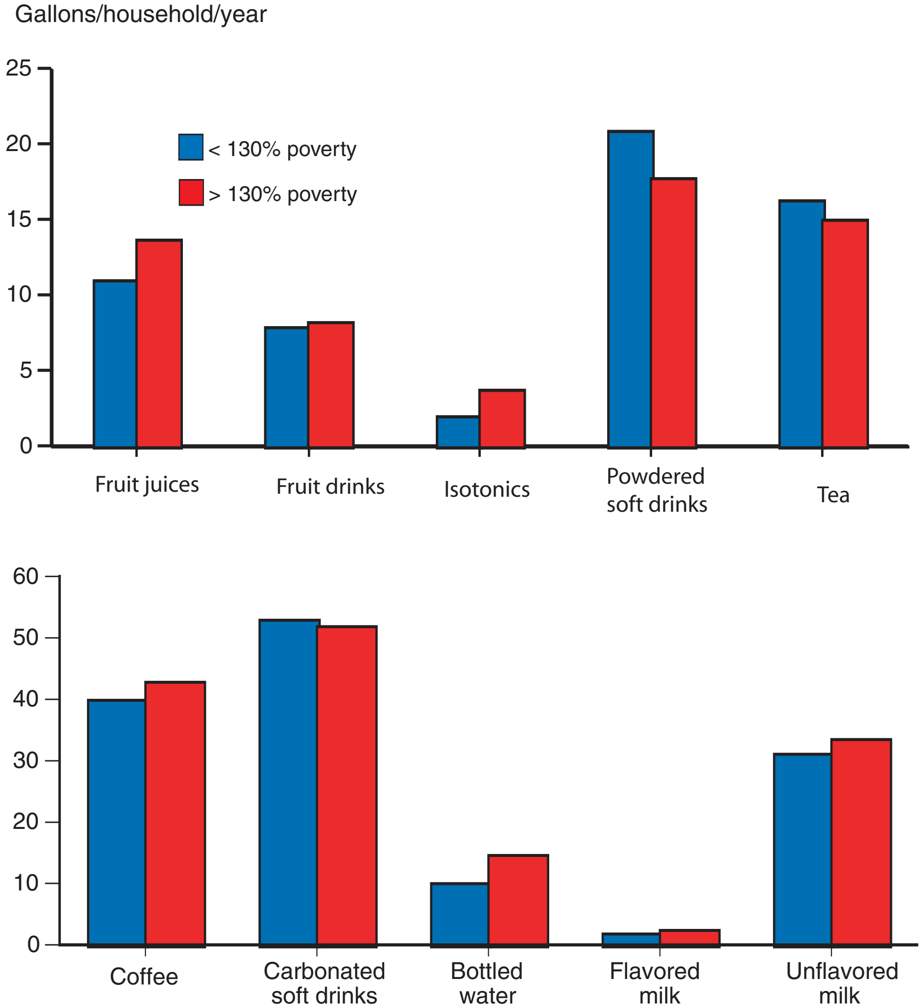


Note: The base category for this figure is a household head less then 25 years of age. Household heads older than 25 are much less likely to purchase unflavored milk.

Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 33

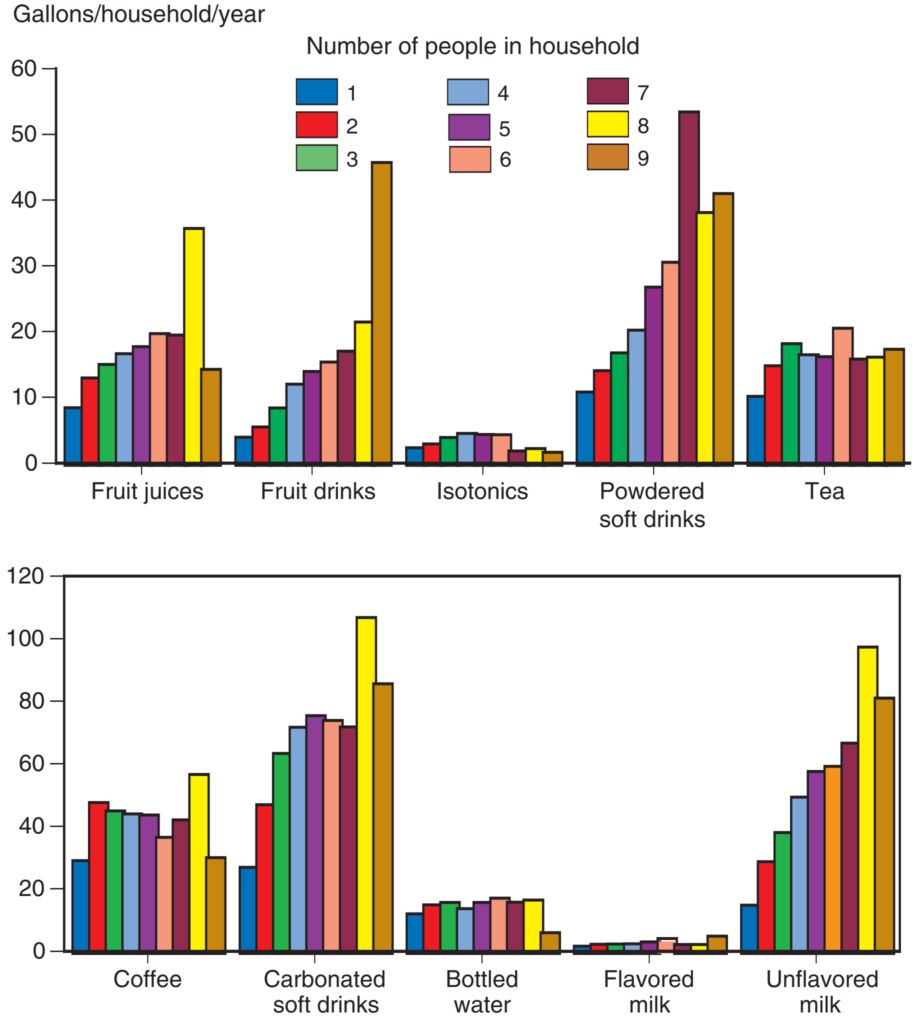
Average purchases (consumption) of selected nonalcoholic beverages, by poverty status



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 34

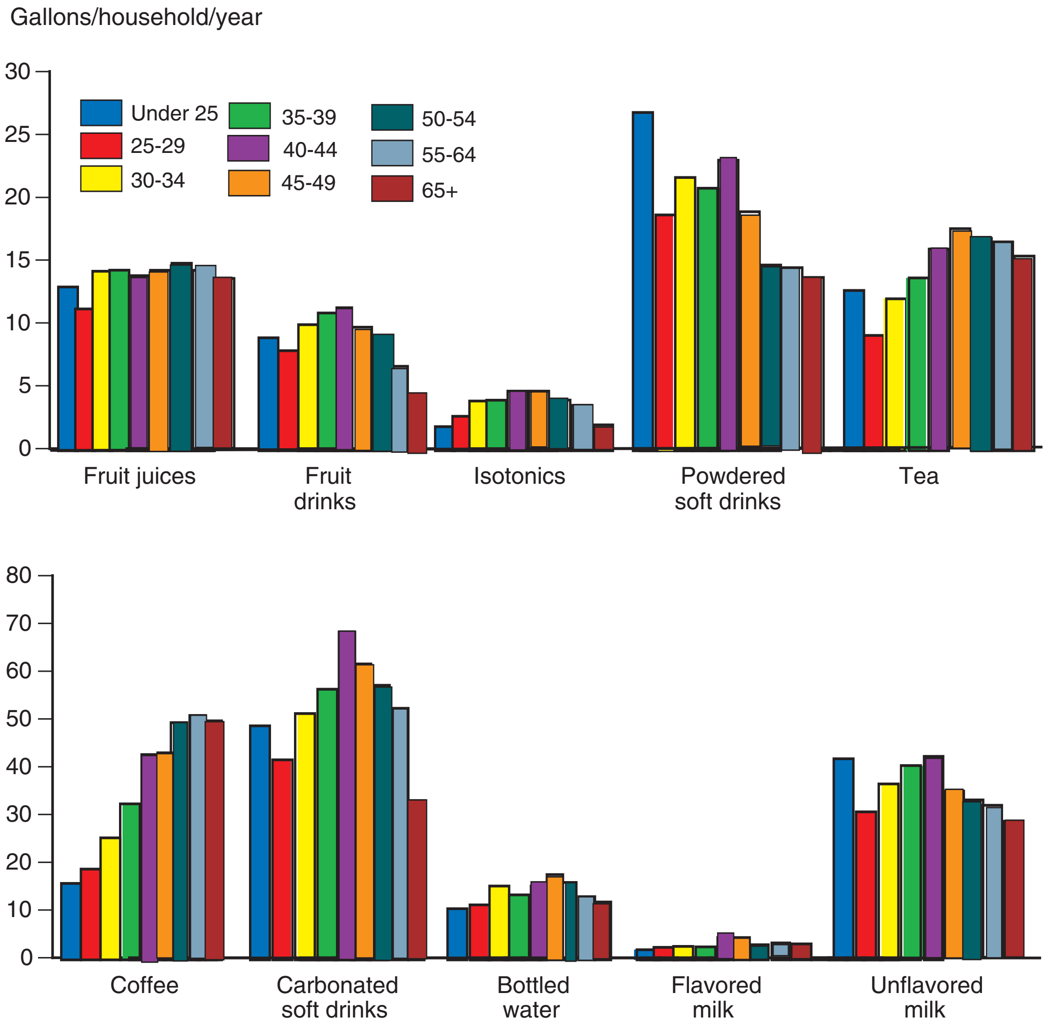
Average purchases (consumption) of selected nonalcoholic beverages, by household size



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 35

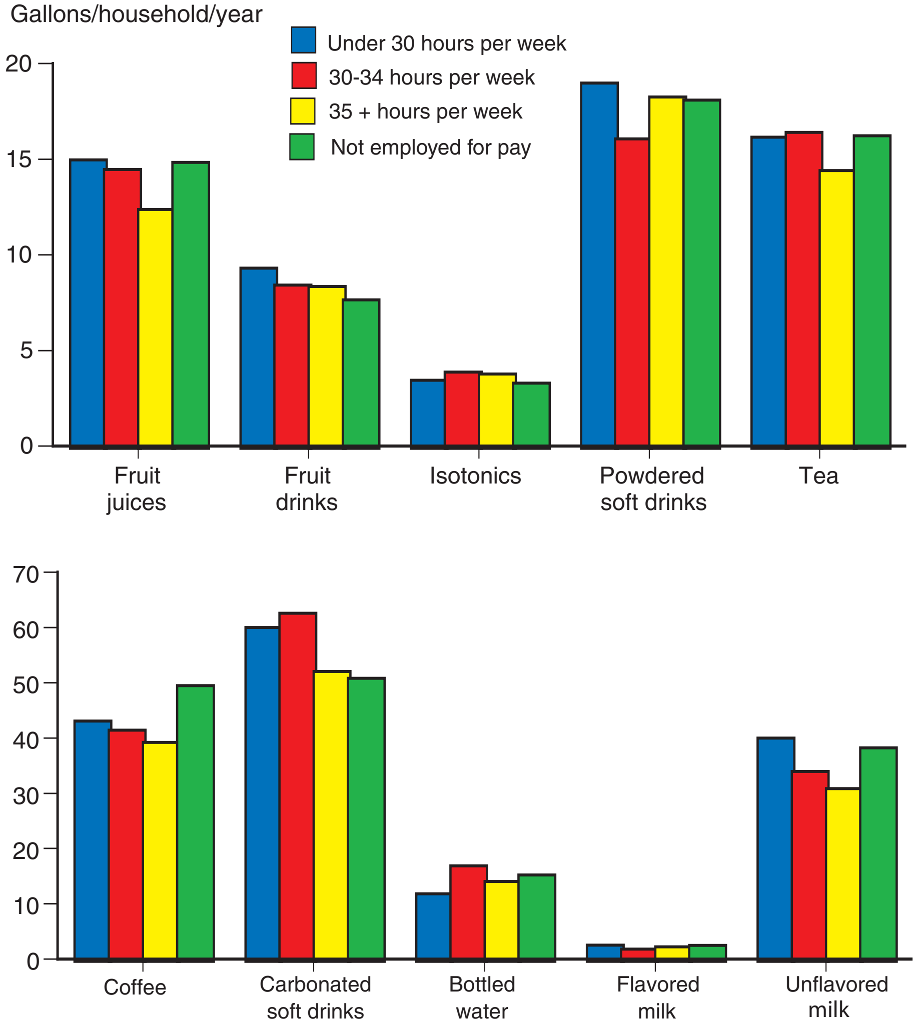
Average purchases (consumption) of selected nonalcoholic beverages, by age of female head of household



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 36

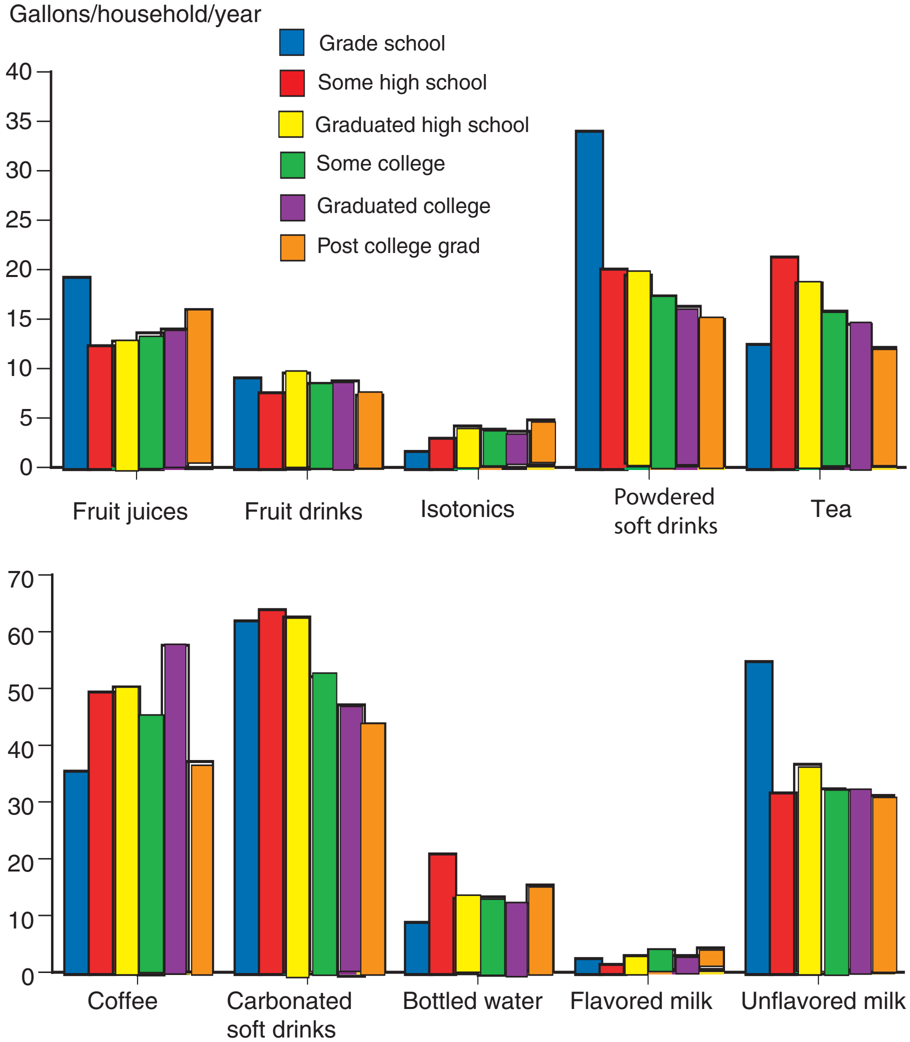
Average purchases (consumption) of selected nonalcoholic beverages, by employment of female head of household



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 37

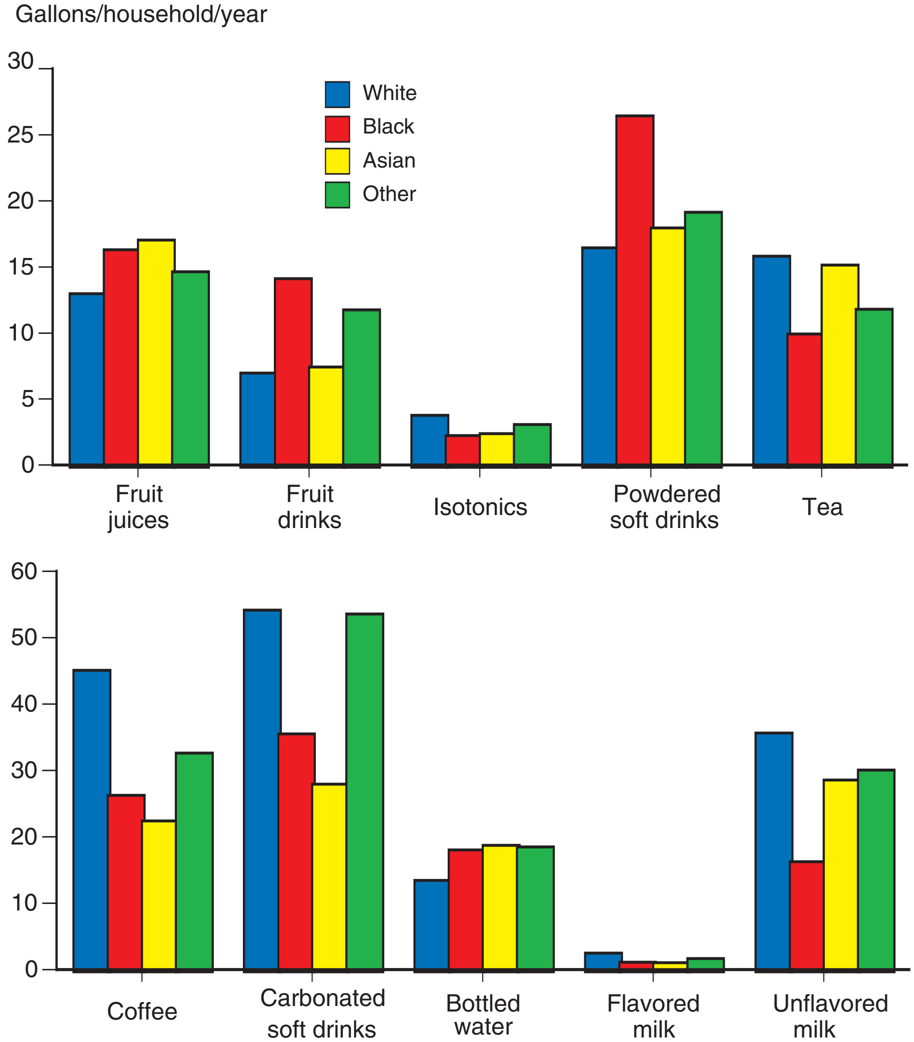
Average purchases (consumption) of selected nonalcoholic beverages, by education of female head of household



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 38

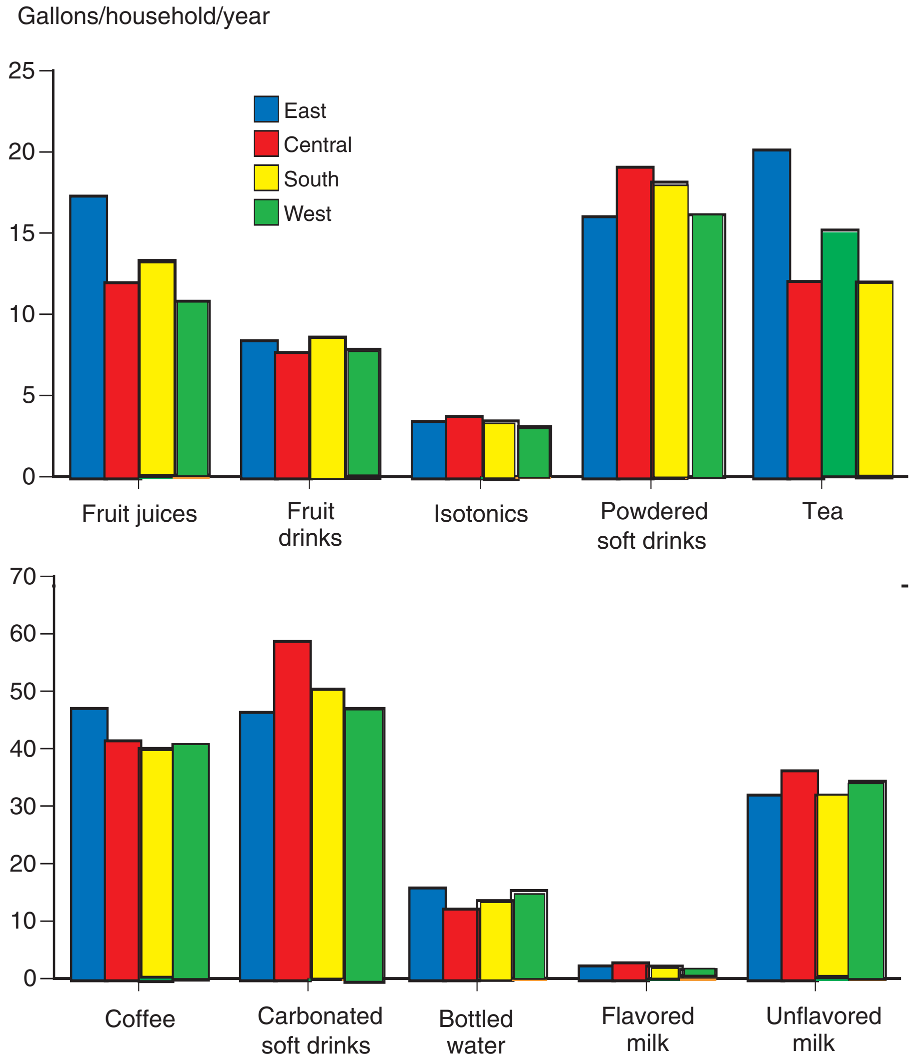
Average purchases (consumption) of selected nonalcoholic beverages, by race



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 39

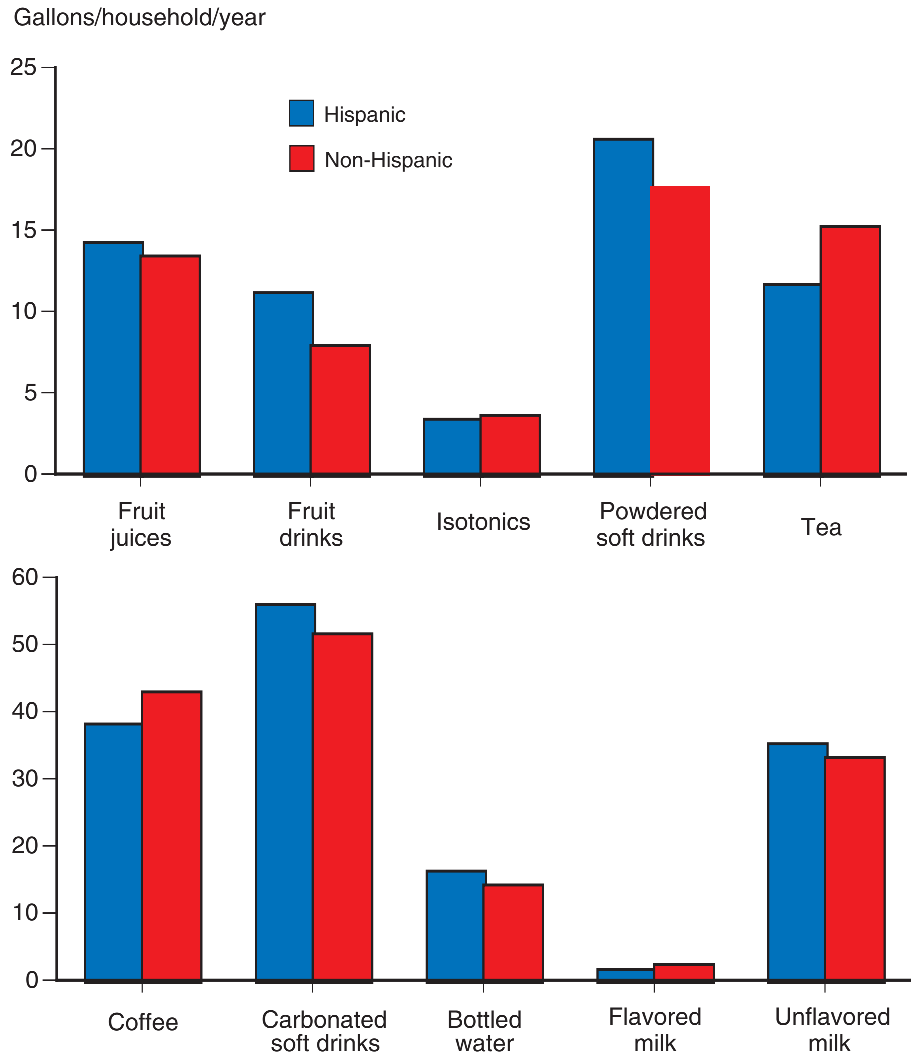
Average purchases (consumption) of selected nonalcoholic beverages, by region



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 40

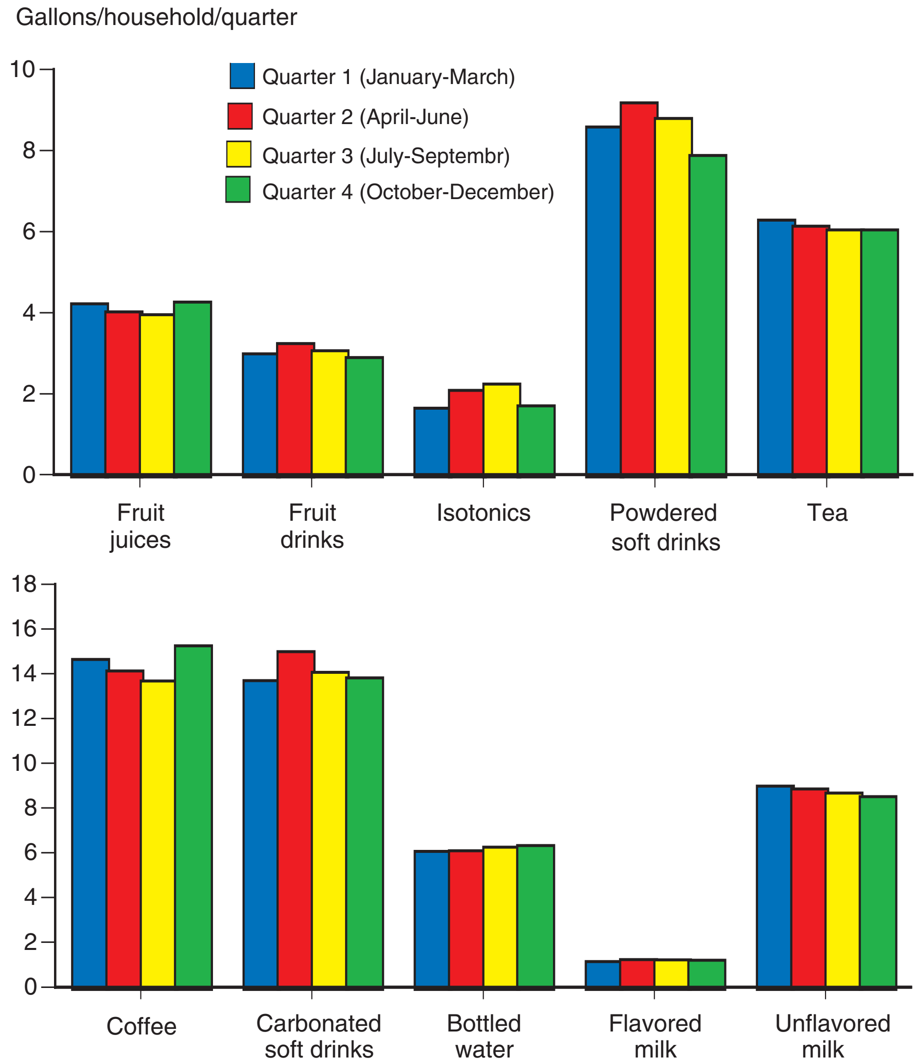
Average purchases (consumption) of selected nonalcoholic beverages, by ethnicity



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.

Figure 41

Average purchases (consumption) of selected nonalcoholic beverages, by calendar quarters



Source: Economic Research Service, USDA, analysis of ACNielsen Homescan data.