

Nutrition and Health Characteristics of Low-Income Populations

Meal Patterns, Milk and Soft Drink Consumption, and Supplement Use

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Snacking, skipping breakfast, eating high-calorie foods, and eating out have all increased in the past decades, and have been suggested as contributors to the increased prevalence of overweight and obesity. These eating behaviors have been shown to be related to overeating, according to small cross-sectional and clinical studies.

The Nutrition and Health Characteristics of Low-Income Populations study examined several eating behaviors for children and adults using 1988-94 National Health and Nutrition Examination Survey (NHANES-III) data. The measures provide a baseline to monitor eating behaviors of Americans, focusing on the low-income population. Participants in the Food Stamp Program (FSP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) are identified. Nonparticipants are separated into income-eligible and higher income groups using the income eligibility cutoff of 130-percent and 185-percent poverty level for FSP and WIC, respectively. School-age children and older adults ages 60 and above are grouped into three income classes—lowest income (130 percent of poverty level or less), low income (greater than 130 and no more than 185 percent), and higher income (above 185 percent). Additional population groups are created using gender and age. Because of data limitations, the WIC portion of this summary presents findings only for children ages 1-4.

The dietary interview component of the NHANES-III collected dietary intake data using a 24-hour recall. Respondents reported all foods and beverages consumed during the day before the interview. For each food consumed, the respondent reported the amount, time, eating occasion, and place. These data were used to identify meal patterns, including the number of meals and snacks consumed, breakfast eating, milk and soft drink consumption, and supplement use.

Meal Patterns: Number of Meals, Breakfast Eating, and Snacks Consumed

Each food intake was recorded into one of four possible meals (breakfast, brunch, lunch, and dinner/supper) or four possible snack categories (snack/beverage, infant feeding, extended consumption, and other). The number of meals consumed each day

showed a “U” shape with respect to age, declining from a high of 3.0 meals among 1- to 2-year-olds to a low of 2.4 meals among 12- to 19-year-olds, then increasing to 2.8 meals among those ages 60 and older (fig. 1). The proportion of individuals eating fewer than three meals a day exhibited an inverse “U” shape with respect to age. More than half of 12- to 29-year-olds (51 percent) reported eating fewer than three meals during the previous day, more than double the 23 percent for the 6- to 11-year-olds.

Breakfast consumption habits have been linked to body weight, with breakfast skippers more likely to weigh more (Lin et al., 2004). On average, 55 percent of Americans reported eating breakfast. Mirroring the age pattern for meals, the percentage of Americans consuming breakfast also exhibits a “U” shape with respect to age. Over 90 percent of 1- to 5-year-olds consumed breakfast, but the proportion dropped precipitously to only 14 percent among 12- to 19-year-olds. Breakfast consumption steadily increased among adults, so that by age 50-59, nearly 60 percent consumed breakfast every day, and over 93 percent of those in their 80s did (fig. 2).

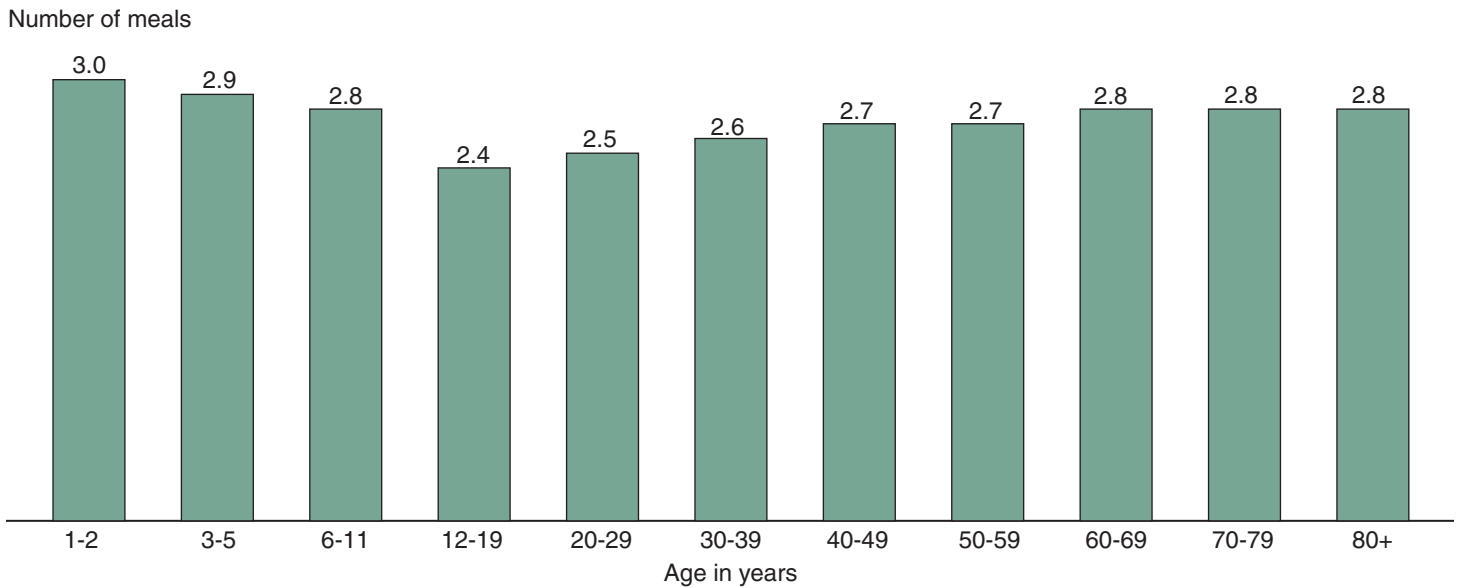
The majority of Americans (88 percent) snacked at least once a day. Preschoolers were more likely to snack at least once (95 percent), whereas fewer than 80 percent of those older than 70 years did so. The frequency in snacking declined with age, from a high of 3.1 snacks per day among 1- to 2-year-olds to fewer than two snacks among those ages 70 and older.

FSP Participants. Compared with higher income nonparticipants, FSP participants consumed fewer meals (2.5 vs. 2.7 meals), and were more likely to report fewer than three meals in the preceding day (44 percent vs. 33 percent). Preschool children and females who participated in the FSP were less likely to consume breakfast than their higher income counterparts (88 percent vs. 93 percent for preschool children; 50 percent vs. 57 percent for females). FSP participants were less likely than higher income nonparticipants to consume a daily snack (83 percent vs. 89 percent). This was true for both males and females. Furthermore, both income-eligible and higher income nonparticipants consumed more snacks than FSP participants did (2.0 vs. 2.3 vs. 1.8).

WIC Children. Most children ages 1-4 consumed three meals in the preceding day. WIC children were more likely than higher income children to consume fewer than three meals (16 percent vs. 10 percent). This difference is largely attributable to a difference among 2-year-olds, where the prevalence of consuming fewer than three meals is twice as high among WIC participants as higher income nonparticipants (12 percent vs. 6 percent). WIC children were also less likely than higher income children to consume breakfast (88 percent vs. 94 percent). Although WIC children were equally likely as children in the other two groups to consume a snack, WIC children consumed more snacks than income-eligible nonparticipating children (2.8 vs. 2.6).

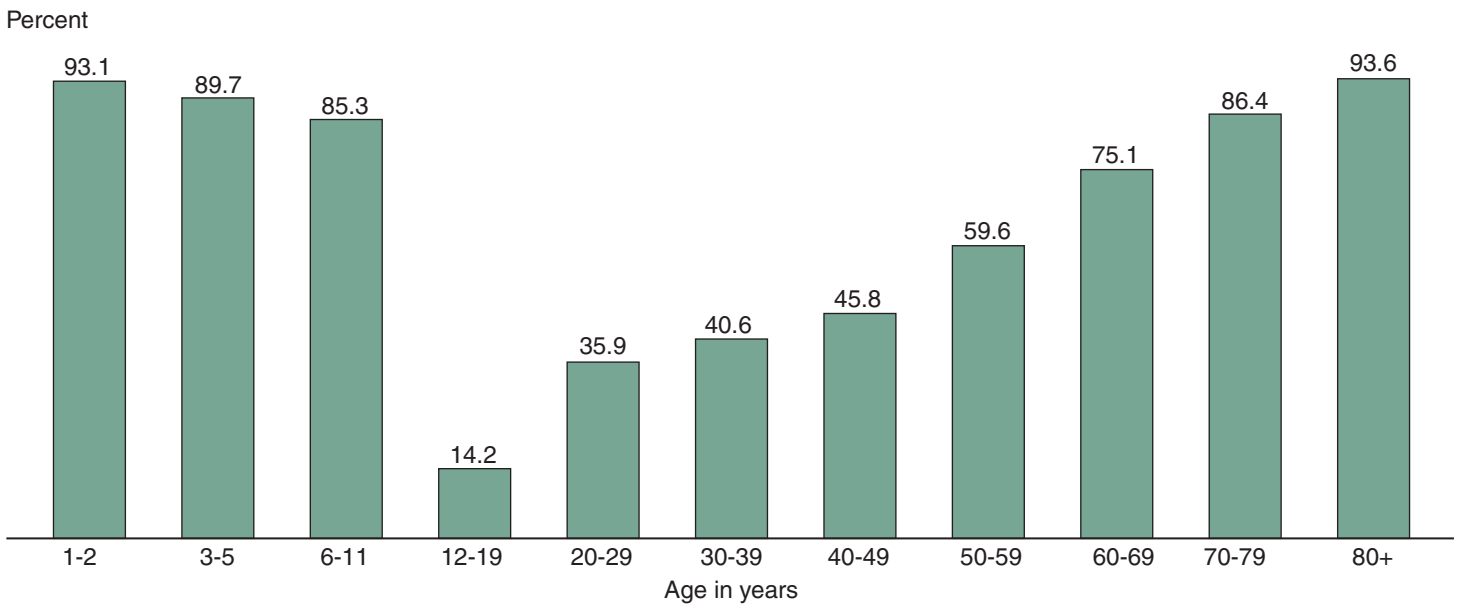
School-Age Children. School-age children consumed an average of 2.6 meals, and 36 percent of them consumed fewer than three meals a day. The proportion of children eating fewer than three meals increases with age, from a low of 20 percent for ages 5-10 to a high of 55 percent for ages 14-18. Children in the lowest income group consumed fewer meals than children in the higher income group (2.6 vs. 2.7) and were more likely to have consumed fewer than three meals a day (39 percent vs. 34 percent). Forty-six percent of all school-age children reported eating breakfast, although children in the lowest income group were less likely than those in the higher income group to consume breakfast (44 percent vs. 48 percent). This difference is concentrated among

Figure 1
Meals consumed per day, by age



Source: National Health and Nutrition Examination Survey, 1988-94.

Figure 2
Americans consuming breakfast, by age



Source: National Health and Nutrition Examination Survey, 1988-94.

those ages 11-13. Nearly 90 percent of school-age children consumed at least one snack per day, with children ages 11-18 consuming an average of two snacks per day.

Older Americans. Older adults in the lowest income group were less likely to consume three meals than older adults in the higher income group (67 percent vs. 80 percent). This pattern is observed for both males and females. The percentage of elderly who consumed fewer than three meals tends to decrease with age. Twenty-eight percent of older adults ages 60-64 consumed fewer than three meals, compared with 19 percent of those ages 85 and older. Older adults in the lowest income group were less likely to eat breakfast than older adults in the other two income groups (78 percent vs. 83 percent vs. 84 percent). Older adults in the lowest income group were also less likely to consume a snack than their higher income counterparts (77 percent vs. 84 percent) and consumed fewer snacks (1.4 vs. 1.9). Both patterns were observed for males and females. Among the elderly, snacking also tends to decrease with age. While 87 percent of those ages 60-69 reported eating at least one snack in the preceding day, only 68 percent of those ages 85 and older reported one or more snacks.

Consumption of Fluid Milk and Soft Drinks

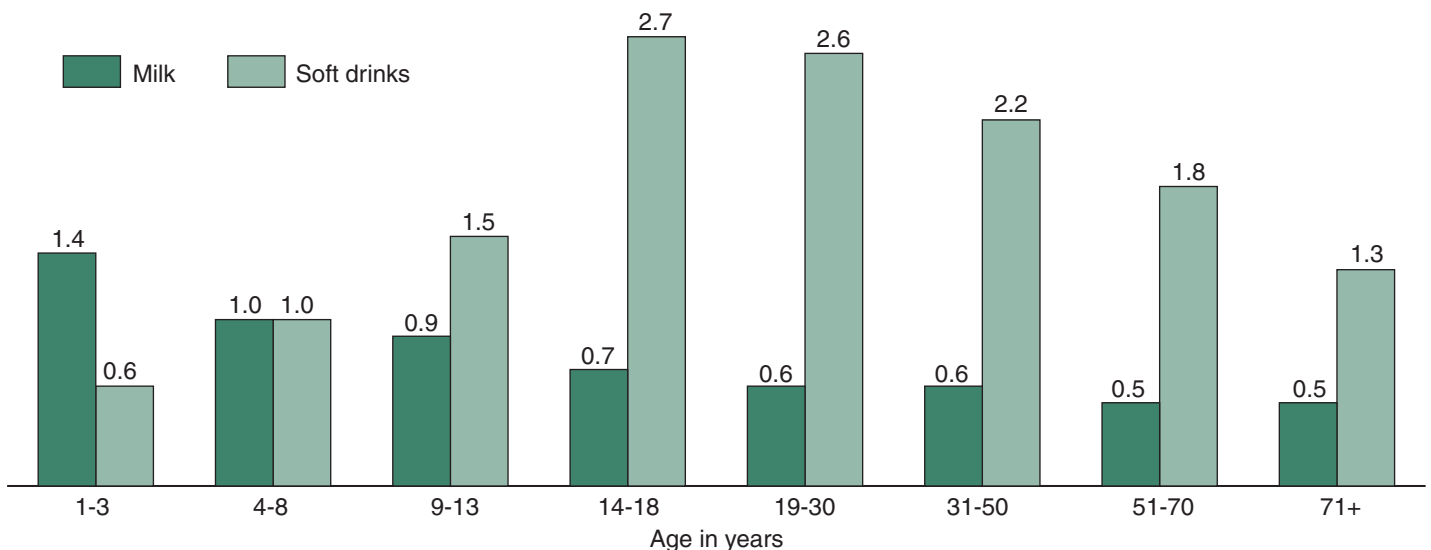
Data from the national food supply indicate that Americans are consuming substantially less milk and substantially more soft drinks than they were 25 years ago (USDA/ERS, 2004). Concerns have been raised about the potential impact of this trend on calcium intake, particularly among children and adolescents (French et al., 2003).

This study confirms that milk consumption is low and that soft drink consumption outstrips milk consumption in virtually all age and gender categories, except those ages 1-8 (fig. 3). With the exception of children younger than 9 and boys ages 9-13, all gender and age groups consumed less than 1 full (8-oz) serving of fluid milk a day. In contrast, both males and females ages 4 and above consumed at least 1 serving of soft drinks. Boys between the ages of 14 and 18 consumed the most soft drinks, averaging 3 servings a day.

FSP Participants. The findings for the general population were also observed for FSP participants and both groups of nonparticipants. No differences in the consumption of milk and soft drinks were found among FSP participants and nonparticipants, for both males and females. There were small differences for certain age groups between FSP participants and higher income nonparticipants, but no consistent pattern in the differences is observed.

WIC Children. Unlike older children, children ages 1-4 consumed more milk than soft drinks (1.2 servings vs. 0.8 servings). This pattern was observed for WIC participants and both groups of nonparticipants. Overall, there were no between-group differences in mean consumption of milk and soft drinks. Among 2-year-olds, however, WIC participants consumed more milk than income-eligible nonparticipants (1.2 servings vs. 1.0 serving). The data also shows that milk consumption decreases with age, whereas soft drink consumption increases with age. While children ages 1-3 consumed more milk than soft drinks, by the age of 4 consumption of soft drinks matched consumption of milk, averaging one serving of each.

Figure 3
Average consumption of milk and soft drinks, by age
Number of 8-oz servings



Source: National Health and Nutrition Examination Survey, 1988-94.

School-Age Children. The data on school-age children confirm that soft drink consumption outstripped milk consumption for all age and gender groups. On average, school-age children consumed 0.8 serving of milk and 2 servings of soft drinks per day. The only difference between income groups in milk consumption was found among 9- to 13-year-olds. In this age group, the lowest income group consumed less milk than the higher income group (0.7 serving vs. 0.8 serving), mainly because of the difference among boys.

Use of Vitamin and Mineral Supplements

Women who take supplements tend to weigh less than other women (Lin et al., 2004). It has been suggested that supplement use is a marker for diets lower in fat and high in fiber. Use of vitamin and mineral supplements may mitigate inadequate nutrient intake from foods. Methods have not been developed yet to adequately incorporate supplement data into measures of individual nutrient intake, but examination of supplement use may provide useful insights. NHANES-III respondents were asked whether they used vitamin or mineral supplements during the preceding month. If supplements were used, respondents were asked to show the actual bottles or jars to interviewers so that the type of supplement and associated dosage information could be recorded.

The data show that 40 percent of all individuals used a vitamin or mineral supplement in the month before participating in the survey. The use of supplements declined initially with age from 46 percent among those ages 1-3 to 25 percent among those ages 14-18, and then rose with age to 49 percent among those older than 70. On average, 46 percent of preschoolers ages 1-4, 30 percent of children ages 5-18, and 48 percent of older adults used a vitamin and/or mineral supplement. Multivitamin-mineral combinations were most popular, used by 47 percent of users, followed by multiple vitamins taken by 35 percent of users. The vitamin-mineral combination supplements likely include nutrients potentially deficient in the diet, such as vitamin C, iron, and zinc; calcium is likely also included, but generally at levels well below other minerals relative to the 1989 Recommended Daily Allowances.

FSP Participants. FSP participants were less likely than either income-eligible or higher income nonparticipants to use vitamin or mineral supplements (26 percent vs. 32 and 44 percent). This pattern applied to both males and females, and was significant among nearly all age groups. Multivitamin-mineral combinations were the most popular supplements among FSP participants as well as among nonparticipants.

WIC Children. WIC children were less likely than higher income children to take a vitamin or mineral supplement (39 percent vs. 55 percent). This was true for each age cohort. However, among 2-year-olds, WIC participants were more likely to receive supplements than income-eligible nonparticipants (48 percent vs. 32 percent). Nearly all children who received supplements received only one supplement. In all three groups, the type of supplement used most often was a multivitamin (53 percent of all children who received supplements), followed by a multivitamin-mineral combination (40 percent).

School-Age Children. School-age children in the lowest income group were less likely than those in the higher income group to use vitamin or mineral supplements (20 percent vs. 37 percent). This pattern held true for both males and females and for all age and gender subgroups. Similarly, the vast majority of school-age children who used supplements (82 percent) took one supplement that was either a multivitamin or a multivitamin-mineral combination.

Older Americans. Elders in the lowest income group were less likely than those in the higher income group to use supplements (40 percent vs. 53 percent). This pattern was observed for males and females. In all three income groups, use of supplements was more common among females than males. The two most common types of supplement used were a multivitamin-mineral combination (46 percent of the elderly who used one or more supplements) and a single vitamin supplement (38 percent).

Information Sources

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French S.A., B.H. Lin, and J.F. Guthrie (2003). "National Trends in Soft Drink Consumption Among Children and Adolescents Aged 6-17 Years: Prevalence, Amounts and Sources, 1977/78 Through 1994/98," *J. American Dietetic Assoc.* 103:1326-31.

For more information, see www.ers.usda.gov/publications/efan04014-1, 04014-2, 04014-3, 04014-4.

NOTE: These studies were not designed to assess program impacts. Do not interpret any reported differences between program participants and nonparticipants as impacts of food assistance programs.

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