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## More California Teens Consume Soda and Fast Food Each Day Than Five Servings of Fruits and Vegetables

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Every day two-thirds of California adolescents (66.3%)—more than two million in all—drink soda, and nearly half (48%)—more than 1.5 million in all—eat fast food. By contrast, only a quarter (25%)—800,000 in all—eat five or more servings of fruits and vegetables each day (Exhibit 1).

These dietary patterns are troubling for a number of reasons. Soda consumption has been linked to increased likelihood of tooth decay, higher total calorie intake, lower bone density in teenage girls, and reduced consumption of milk, fruits and vegetables.<sup>1,2</sup> Excessive calorie intake is a major cause of overweight and obesity, which in turn contribute to chronic health conditions such as diabetes, hypertension and heart disease.

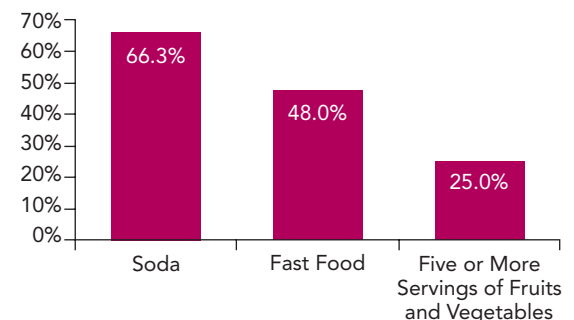
Fast food has been linked to higher fat intake and higher overall calorie consumption for adolescents.<sup>3</sup> Frequent consumption of fast food is troubling because foods eaten away from home tend to be higher in fat and saturated fat, and lower in fiber, calcium and iron than foods prepared at home.<sup>4</sup>

Furthermore, many teens are not eating enough fruits and vegetables. Fruits and vegetables are low in calories and rich in vitamins, minerals and fiber, and contain nutrients that help protect against health conditions such as diabetes, cancer and cardiovascular disease.<sup>5</sup>

This policy brief examines consumption of soda, fast food, and fruits and vegetables by adolescents based on data from the 2003

### Exhibit 1

#### Percent of California Adolescents Consuming Soda, Fast Food and at Least Five Servings of Fruits and Vegetables Every Day, Ages 12-17, 2003



Note: Soda includes non-diet carbonated beverages and other sugary drinks.

Source: 2003 California Health Interview Survey

California Health Interview Survey (CHIS 2003). Policy recommendations are presented to address high rates of soda and fast food consumption and comparatively low intake of fruits and vegetables by California teens.

#### More than One Third of California Teens Drink Two or More Sodas Every Day

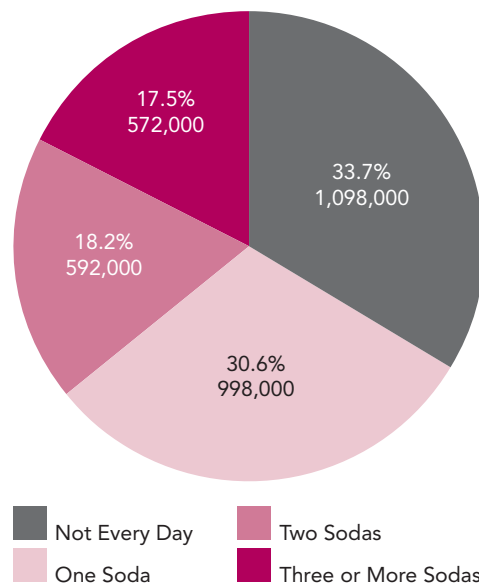
California adolescents drink 1.4 sodas every day, on average. Adolescents were asked how

THE CALIFORNIA ENDOWMENT

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## Exhibit 2

Daily Soda Consumption, Adolescents  
Ages 12-17, California 2003

Note: Soda includes non-diet carbonated beverages and other sugary drinks. Adolescents in the "not every day" category reported not drinking soda the day before the survey, however the exact frequency of soda consumption is not known for this group. Many of the adolescents who responded that they did not drink soda the day before the survey are still likely to drink soda, although less often than daily.

Source: 2003 California Health Interview Survey

many glasses or cans of non-diet soda or other sweetened beverages they consumed on the previous day (referred to as soda throughout). Nearly two-thirds of California teens (66.3%) drink at least one soda every day, and over one third (35.7%) drink two or more sodas every day (Exhibit 2).<sup>6</sup> Exact serving sizes are unknown; however data from the Nationwide Food Consumption Survey indicated that the average portion size for sugary drinks was 18.9 fluid ounces for children ages 2-18.<sup>7</sup> This suggests that California teens are drinking 26.5 ounces of soda every day on average.

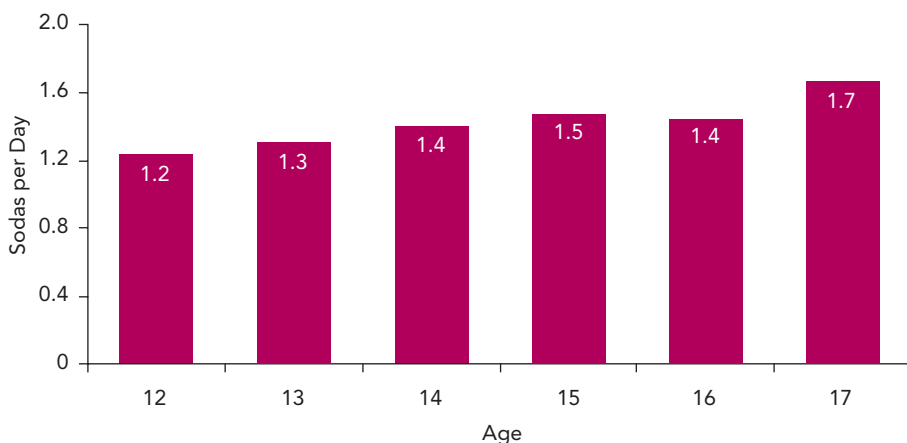
## Soda Consumption Increases with Age

Consumption of soda and other sugary beverages increases steadily throughout adolescence. Seventeen-year-olds reported drinking 40% more soda (1.7 per day) than twelve-year-olds (1.2 per day; Exhibit 3).

## Boys, Latinos, African Americans and the Least-Affluent Teens Drink the Most Soda

Overall, adolescent boys drink almost 25% more soda and other sugar-sweetened beverages (1.6 per day) than adolescent girls (1.3 per day; Exhibit 4), and this difference is consistent among Latino and white teens. African-American boys and girls both drink two sodas per day on average, the most of any racial or ethnic group.

## Exhibit 3

Average Daily Soda Consumption by Age,  
Adolescents Ages 12-17, California, 2003

Note: Soda includes non-diet carbonated beverages and other sugary drinks.

Source: 2003 California Health Interview Survey

African-American adolescents drink nearly twice as much soda and other sugary beverages (2 per day) as white (1.2 per day) or Asian adolescents (1.1 per day). Latino adolescents drink 1.7 sodas per day, or approximately 50% more than whites and two-thirds more than Asians (Exhibit 5). The reasons for these differences are unclear; however, they may be related in part to advertising targeted at specific groups.<sup>8</sup>

Soda consumption tends to increase as household income decreases. Adolescents with household incomes below 300% of the federal poverty level (FPL) drink more soda and other sugary drinks (1.5 to 1.6 per day) than teens

from households with incomes of 300% FPL and above (1.2 per day; Exhibit 5).

### Soda Consumption Increases with Availability of Soda in School Vending Machines and with Fast Food Consumption

Recent efforts in California have focused on removing sodas from school campuses, and there is reason to believe that this may be an effective tactic in reducing soda consumption among adolescents. Adolescents who report that sodas are available in school vending machines drink 25% more soda and other sugar-sweetened beverages (1.5 per day) than those who do not have access to soda in school vending machines (1.2 per day; Exhibit 6). It is important to note that although the data indicate an association between the availability of sodas in school vending machines and increased soda consumption, many schools provide other outlets where soda is available.

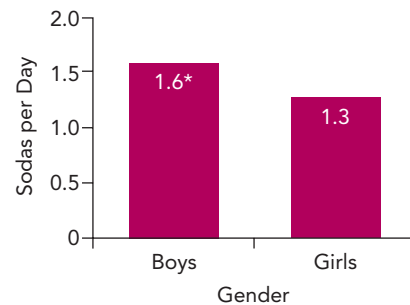
Availability of soda in school vending machines varies significantly by age. Among 12-13 year olds, 56% reported that soda is available in vending machines in their schools. This number jumps to 87.8% for 14-17 year olds, indicating that high schools are much more likely to have sodas available for sale in vending machines than middle schools (Exhibit 7).<sup>9</sup> The availability of soda in school vending machines does not vary by race/ethnicity or income.

### 1.5 Million California Adolescents Eat Fast Food Every Day

Nearly half of adolescents (48%)—more than 1.5 million in all—eat fast food every day. Of these adolescents, over 300,000 (9.5% of all adolescents) eat fast food twice each day, and nearly 90,000 (2.7% of all adolescents) eat fast food three or more times each day (Exhibit 8). The data include the number of times respondents ate fast food the previous day but do not include items ordered or portion sizes.<sup>10</sup>

**Average Daily Soda Consumption by Gender, Adolescents Ages 12-17, California, 2003**

Exhibit 4



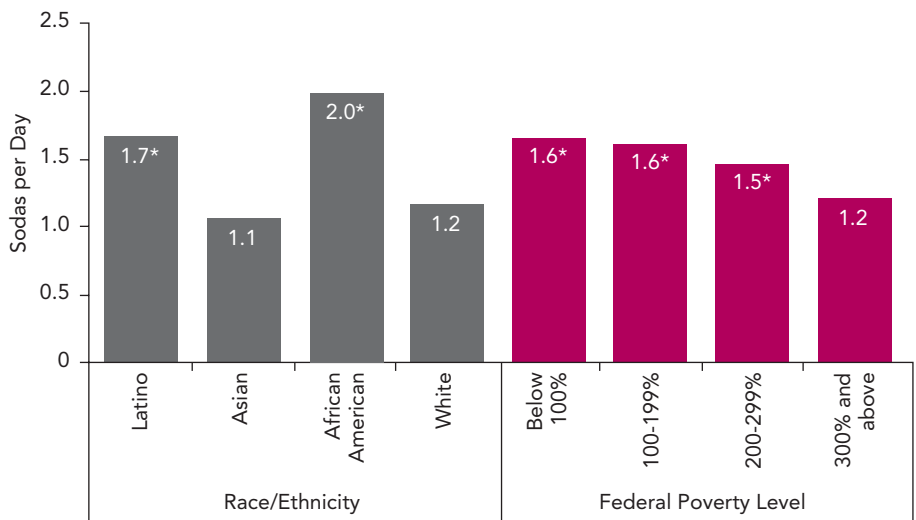
\* Significantly different from girls

Note: Soda includes non-diet carbonated beverages and other sugary drinks.

Source: 2003 California Health Interview Survey

**Average Daily Soda Consumption by Race/Ethnicity and Income, Adolescents Ages 12-17, California, 2003**

Exhibit 5



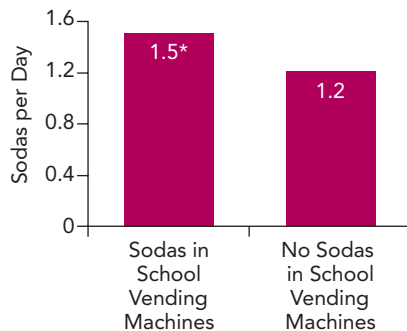
\* Significantly different from white adolescents or those at 300% FPL and above.

Note: Soda includes non-diet carbonated beverages and other sugary drinks. The estimates for Pacific Islander and American Indian/Alaska Native adolescents were unreliable. The 2003 FPL was \$12,384 for a family of two, \$14,680 for a family of three, and \$18,810 for a family of four, <http://www.census.gov/bbes/poverty/tbresbld/tbresb03.html> (accessed May 2, 2005).

Source: 2003 California Health Interview Survey

## Exhibit 6

### Average Daily Soda Consumption by the Availability of Soda in School Vending Machines, Adolescents Ages 12-17, California, 2003



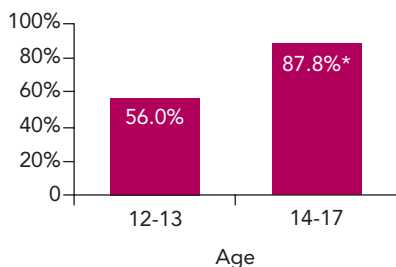
\* Significantly different from No Sodas in School Vending Machines

Note: Soda includes non-diet carbonated beverages and other sugary drinks.

Source: 2003 California Health Interview Survey

## Exhibit 7

### Percent of Adolescents Whose Schools Have Soda Available in Vending Machines by Age, Ages 12-17, California, 2003



\* Significantly different from ages 12-13

Source: 2003 California Health Interview Survey

### Latinos, Asians, African Americans and the Least-Affluent Teens Eat the Most Fast Food

Fast food consumption among adolescents varies significantly by race/ethnicity, household income and age. More than half of Latino (56.5%), Asian (51.4%), and African-American (58.1%) adolescents eat fast food every day compared to 38.6% of white adolescents (Exhibit 9).

More teens from moderate- and lower-income households eat fast food every day than more affluent teens. Over half of teens with family incomes below 200% FPL eat fast food every day compared to 43.2% of teens with household incomes of at least 300% FPL (Exhibit 9). Fast food consumption increases with age, from 43.7% of 12 year olds to 51.9% of 17 year olds eating fast food daily (data not shown).

### Increased Fast Food Consumption Means Fewer Fruits and Vegetables but More Soda

The more often adolescents eat fast food the less likely they are to eat at least five servings of fruits and vegetables a day. Compared with adolescents who eat fast food every day, significantly more teens who do not eat fast food eat at least five servings of fruits and vegetables (Exhibit 10).<sup>11</sup> These dietary trends are likely influenced by the relative cost, availability and attractiveness of fruits and vegetables compared to fast food. Grains, fats and sweets are high in energy density and among the lowest-cost food options, whereas fruits and vegetables are often less affordable.<sup>12</sup>

Soda consumption is also closely linked with fast food consumption among California adolescents. Teens who eat fast food every day drink more soda and other sugar-sweetened beverages than those who do not eat fast food every day (Exhibit 11). Specifically, teens who eat fast food every day drink an additional soda for each time they eat fast food beyond the first instance.

### Discussion

When sodas are available in vending machines at school, teens drink more soda and other sugary beverages than when they are not. The more often teens eat fast food, the more soda they consume and the less likely they are to eat at least five servings of fruits and vegetables a day.

Obesity and chronic conditions related to poor nutrition are complex and multifaceted issues that cannot be eliminated by a single intervention. However, poor diet is one major contributor to overweight and obesity. Individuals make food choices based on taste, economy (food prices and income), availability, convenience, health (including weight) and variety.<sup>13</sup> The food environment at school, at home and in the community—including marketing, cost, availability, convenience and attractiveness of different foods—all influence adolescents' food choices. Efforts to improve adolescents' nutrition must improve the availability and attractiveness of healthy options in the environment while making unhealthy choices relatively less accessible and less attractive.

Schools are an important venue for policy changes targeted at improving adolescent nutrition. Teens spend more time in schools than in any other environment outside of their homes, and policymakers can have a positive influence on the school food environment through appropriate policies and funding.

### Policy Recommendations

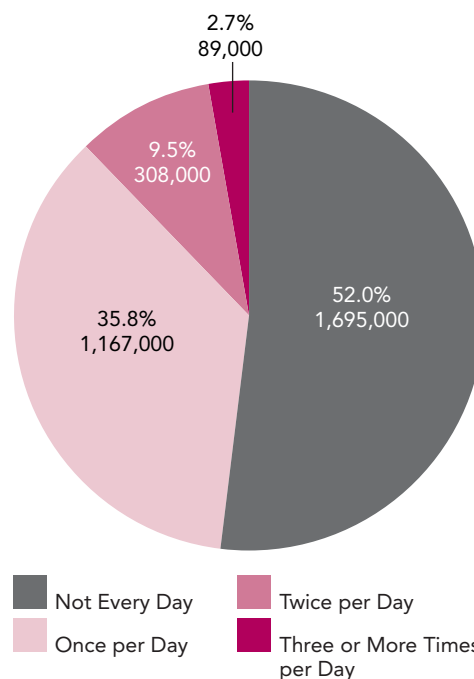
To improve adolescents' diets and reduce the risk of obesity—as well as the chronic health conditions, medical care costs, and poor health and higher risk of death that result from obesity—we recommend that the State government and schools take the following actions.

#### State Legislature:

- Establish policies to eliminate soda, unhealthy snacks and fast food entrees on school campuses.
- Remove soda and other sugary drinks from schools, but allow for healthier options such as juices, unsweetened drinking water, low- and non-fat milk products including non-dairy milk products and electrolyte-replacement beverages.

**Daily Fast Food Consumption, Adolescents Ages 12-17, California, 2003**

Exhibit 8

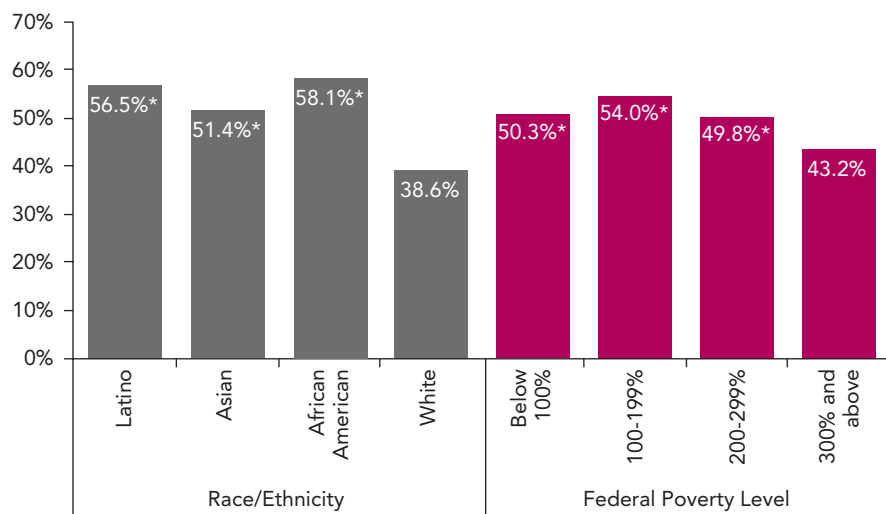


Note: Many adolescents who responded that they did not eat fast food the day before the survey are still likely to eat fast food, although less often than daily.

Source: 2003 California Health Interview Survey

**Percent of Adolescents Eating Fast Food Every Day by Race/Ethnicity and Income, Ages 12-17, California, 2003**

Exhibit 9



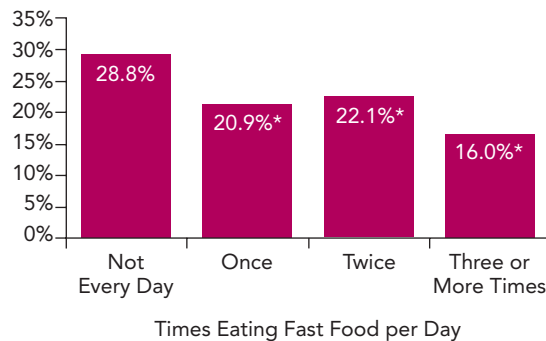
\* Significantly different from white adolescents or those at 300% FPL and above.

Note: The estimates for Pacific Islander and American Indian/Alaska Native adolescents were unreliable. The 2003 FPL was \$12,384 for a family of two, \$14,680 for a family of three, and \$18,810 for a family of four, <http://www.census.gov/bbes/poverty/tbresbld/tbresb03.html> (accessed May 2, 2005).

Source: 2003 California Health Interview Survey

## Exhibit 10

**Percent of Adolescents Eating at Least Five Servings of Fruits and Vegetables by the Number of Times Eating Fast Food per Day, Ages 12-17, California, 2003**



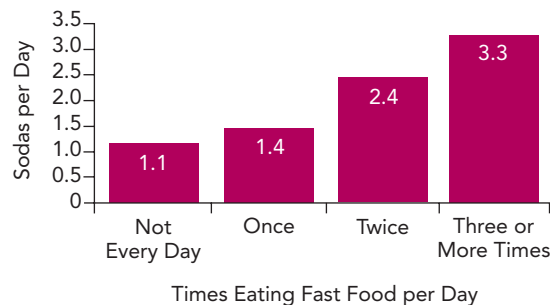
\* Significantly different from Not Every Day

Note: For respondents eating at least five servings of fruits and vegetables a day, the difference between the percentages not eating fast food every day and eating fast food twice a day had a probability  $p < 0.06$ .

Source: 2003 California Health Interview Survey

## Exhibit 11

**Average Daily Soda Consumption by the Number of Times Eating Fast Food per Day, Adolescents Ages 12-17, California, 2003**



All differences are significant

Note: Soda includes non-diet carbonated beverages and other sugary drinks.

Source: 2003 California Health Interview Survey

- Establish restrictions on foods sold outside the federal school meal program by limiting the percentage of calories from fat and saturated fat, the percentage of sugar by weight and the total calories in all individually sold or served food items for all schools K-12, and concentrate on making these items attractive to the student population.
- Add funding to school meal programs to increase the availability and appeal of fresh fruit and vegetables in the school meal programs.

#### Individual Districts and Schools:

- Establish, implement and enforce policies to eliminate soda, unhealthy snacks and fast food entrees on school campuses at the local level.
- Solicit student involvement in the development and implementation of policies that improve the food environment on school campuses.
- Solicit parent and community involvement and support to improve the food environment on school campuses.

#### Data Source

All statements in this report that compare rates for one group with another group reflect statistically significant differences ( $p < 0.05$ ) unless otherwise noted. The findings in this brief are based on data from the 2003 California Health Interview Survey (CHIS 2003). CHIS 2003 provides the most recent information available on adolescent dietary behavior for the state of California. CHIS 2003 completed interviews with 4,010 adolescents ages 12-17, drawn from every county in the state, in English, Spanish, Chinese (both Mandarin and Cantonese), Vietnamese and Korean. CHIS is a collaboration of the UCLA Center for Health Policy Research, the California Department of Health Services, and the Public Health Institute. Funding for CHIS 2003 was provided by the California Department of Health Services, The California Endowment, the National Cancer Institute, the Centers for Disease Control and Prevention (CDC), the Robert Wood



Johnson Foundation, the California Office of the Patient Advocate, Kaiser Permanente, L.A. Care Health Plan, and the Alameda County Health Care Agency. For more information on CHIS, visit [www.chis.ucla.edu](http://www.chis.ucla.edu).

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### Notes

- 1 Savoca MR, Evans CD, Wilson ME, Harshfield GA, Ludwig DA. The association of caffeinated beverages with blood pressure in adolescents. *Archives of Pediatrics & Adolescent Medicine*. May 2004;158(5):473-477.
- 2 Cullen KW, Ash DM, Warneke C, de Moor C. Intake of soft drinks, fruit-flavored beverages, and fruits and vegetables by children in grades 4 through 6. *American Journal of Public Health*. Sep 2002;92(9):1475-1478. Harnack L, Stang J, Story M. Soft drink consumption among U.S. children and adolescents: nutritional consequences. *Journal of the American Dietetic Association*. Apr 1999;99(4):436-441.

- 3 French SA, Story M, Neumark-Sztainer D, Fulkerson JA, Hannan P. Fast food restaurant use among adolescents: associations with nutrient intake, food choices and behavioral and psychosocial variables. *International Journal of Obesity and Related Metabolic Disorders*. Dec 2001;25(12):1823-1833.
- 4 Lin BH, Guthrie J, and Blaylock JR. *The Diets of America's Children: Influences of Dining Out, Household Characteristics, and Nutrition Knowledge*. U.S. Dept. of Agriculture, Econ.Res. Serv., AER-746, Dec 1996. <http://www.ers.usda.gov/publications/aer746/>. Accessed 4/8/05.
- 5 Liu RH. Health benefits of fruit and vegetables are from additive and synergistic combinations of phytochemicals. *American Journal of Clinical Nutrition*. Sep 2003;78(3 Suppl):517S-520S.
- 6 Respondents were asked "Yesterday how many glasses or cans of soda (such as Coke) or other sweetened drinks (such as fruit punch or Sunny Delight) did you drink? Do not count sugar-free drinks."
- 7 These data are for the years 1994-1996. Since these data are ten years old and include a wide age range it is likely that the average portions consumed by adolescents in the CHIS 2003 data are at least that large.
- 8 Tirodkar MA, Jain A. Food messages on African-American television shows. *American Journal of Public Health*. Mar 2003;93(3):439-441.
- 9 Since these data were collected in 2003, measures have taken effect in California that limit the sale of sodas in vending machines in middle schools statewide and in all schools (K-12) in the Los Angeles Unified School District. For more information on these policies, please see <http://www.nojunkfood.org/policy/>. Accessed 06/07/05.
- 10 Respondents were asked "Yesterday, how many times did you eat fast food? Include fast food meals eaten at school, at home, or at fast-food restaurants, carryout or drive thru."
- 11 Respondents were asked "Yesterday how many servings of fruit, such as an apple or a banana did you eat?" and "Yesterday how many servings of vegetables, like corn, green beans, green salad, or other vegetables did you eat?"
- 12 Drewnowski A, Darmon N. Food choices and diet costs: an economic analysis. *Journal of Nutrition*. Apr 2005; 135(4):900-904.
- 13 Finkelstein E, French S, Variyam JN, Haines PS. Pros and cons of proposed interventions to promote healthy eating. *American Journal of Preventive Medicine*. Oct 2004; 27(3 Suppl):163-171.



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