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Diet Quality of American Young Children by WIC Participation Status:

Data from the National Health and Nutrition Examination Survey, 1999-2004

United States Department of Agriculture
Food and Nutrition Service

July 2008

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Executive Summary

This report uses the most recently available data from the National Health and Nutrition Examination Survey (NHANES 1999-2004) to provide a comprehensive picture of the diets of WIC participant children—the largest segment of the WIC population. The report examines nutrient intakes, diet quality, and food choices—including consumption of WIC-approved foods. Data are presented for WIC participant children and two groups of nonparticipant children—those who were income-eligible for WIC but did not participate in the program, and higher-income children who were not eligible for the program.

The WIC Program

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides nutrient-dense foods, nutrition education, and referral to health care services for low-income pregnant women, breastfeeding and non-breastfeeding postpartum women, infants, and children up to age five who are at nutritional risk. In FY2007, the program served a monthly average of nearly 8.3 million persons. About half of the WIC caseload is children, 25 percent infants, and 25 percent women. Annual costs for the program are 5.45 billion dollars, with food costs accounting for 71 percent of program costs.

When the WIC program was created in 1972, the primary goal was to ensure that low-income women and children had access to nutritious foods during critical periods of growth and development: pregnancy, infancy and early childhood. WIC food packages were designed to provide foods high in one or more of the nutrients found to be lacking in the diets of low-income Americans: protein, calcium, iron, and vitamins A and C. WIC food benefits comprise the largest component of program costs, and are provided to WIC participants through vouchers redeemable at authorized retailers.

WIC food packages have been largely unchanged from the program's inception until recently.[1] In 2005, proposed changes to WIC food packages were introduced as a result of a comprehensive review by the Institute of Medicine (IOM), at the request of the U.S. Department of Agriculture's (USDA), Food and Nutrition Service (FNS) (Institute of Medicine (IOM), 2005a). The final changes were published in an Interim Rule in the Federal Register on December 6, 2007.

In *WIC Food Packages: Time for a Change*, the IOM cites four major trends as the impetus for revising WIC food packages:

- Demographic changes in the WIC population,
- Increased variety in the food supply,
- Changes in food consumption patterns, and
- Changes in the health risks of the WIC-eligible population.

Compared to the 1970s, women and children applying to the WIC program today are less likely to be undernourished and more likely to be overweight. While there is no evidence that WIC participation contributes to the risk of overweight, the IOM noted that several WIC food packages provided more than the recommended amounts of milk or milk products and fruit juice. In addition, WIC packages did not include recommended varieties of food, for example whole fruit and vegetables and whole grains (IOM, 2005a).

Proposed changes in WIC food packages will align WIC foods with the *2005 Dietary Guidelines for Americans* (DGA) (U.S. Department of Health and Human Services and USDA, 2005) and infant feeding practice guidelines of the American Academy of Pediatrics (AAP, 2005).

Focus of the Research

This report provides information on the nutrient intakes, diet quality, and food choices of WIC children ages 1 to 4 and two groups of nonparticipants, prior to implementation of the revised WIC food packages. It reports on the largest group of WIC participants and serves as a reference for comparison with future NHANES data collected after the revised food packages are fully imple-

[1] In 1980, the WIC food packages were revised to add beans and peanut butter.

mented. Some analyses are limited to children 2 to 4 years of age because the reference standards used apply to individuals 2 years and older.

Women and infants are not examined in this report. NHANES samples of pregnant and breastfeeding women are too small to provide statistically reliable estimates for subgroups of women based on WIC participation, and many of the food choice and diet quality measures used for this report do not apply to infants.

This research was not designed to assess the impact of WIC or in any way attribute differences observed between WIC participants and nonparticipants to an effect of the program. Estimation of program impacts requires a randomized experiment or quasi-experimental design to control for selection bias (Hamilton and Rossi, 2002). A quasi-experimental study design was not feasible due to limitations of the NHANES data. In this report, data on nonparticipant children are presented strictly to provide context for data on WIC participant children. For example, it is useful to understand the extent to which dietary patterns observed in the diets of WIC participants mirror those observed in other populations groups.

The research presented in this report addresses four basic questions about the diets of WIC participant children: Do WIC participants get enough of the right kinds of foods to eat (measured in terms of nutrient intakes and energy sources)? Are WIC children more likely to be overweight than nonparticipants (are they consuming too many calories)? How does the quality of diets consumed by WIC children compare with those of nonparticipant children? And how do food choices differ for WIC participants and nonparticipants (do different food choices help explain differences in diet quality)?

Do WIC Participants Get Enough of the Right Kinds of Food to Eat?

For this study, we addressed the question of whether WIC participants get "enough of the right kinds of food" by examining intakes of 18 essential vitamins and minerals.[2] We also examined intakes of macronutrients (protein, carbohydrates, and fat) as percentages of energy intakes, and the percentage of energy consumed from solid fats and added sugars.

Intakes were examined for all children 1-4 years, and comparisons were made for WIC participants and nonparticipants. The main findings are discussed below.

Vitamins and minerals with defined Estimated Average Requirements (EARs)

The prevalence of adequate usual daily intakes of vitamins and minerals is assessed by comparing the usual daily intakes of a population group to Estimated Average Requirements (EARs). The prevalence of adequate usual daily intakes is defined as the proportion of the group with usual daily intakes at or above the EAR. Thirteen of the 18 vitamins and minerals examined in this report have defined EARs.

During 1999-2004, virtually all children ages 1 to 4 had adequate usual daily intakes of all but one of the vitamins and minerals with defined EARs (Figure 1). The one exception was Vitamin E—only 17 percent of children 1 to 4 years had usual daily intakes of vitamin E that met the EAR. This is consistent with most recent studies of vitamin E intake.

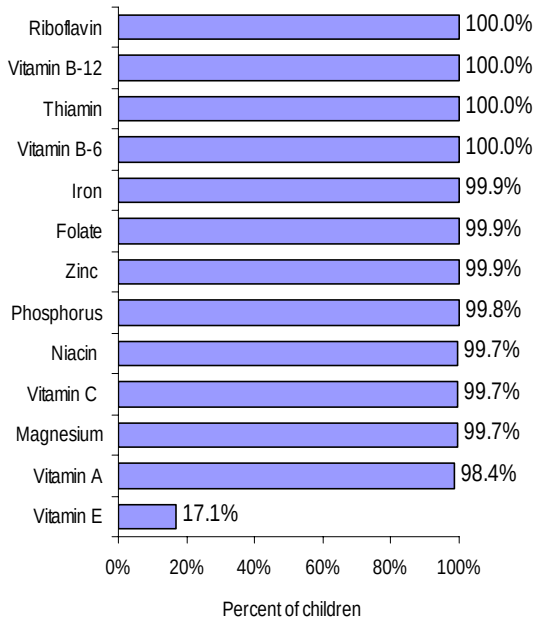
There were no significant differences between WIC children and either income-eligible or higher-income nonparticipant children in the prevalence of adequate usual daily intakes of vitamins and minerals with defined EARs

Calcium, Potassium, Fiber and Sodium

For calcium, potassium, and fiber it was not possible to draw firm conclusions about the adequacy of children's usual diets because EARs have not been defined. Populations with mean usual daily intakes that meet or exceed the Adequate Intake (AI) levels defined for these nutrients can be assumed to have high levels of adequacy. owever, no conclusions can be drawn when mean usual daily intakes fall below the AI. For sodium, the major concern is the potential for excessive intakes, so usual daily intakes were compared to the Tolerable Upper Intake Level (UL) which is the

[2] Nutrient intake data presented do not include contributions from dietary supplements.

Figure 1—Percent of Children Age 1-4 with Adequate Usual Intakes of Vitamins and Minerals



maximum intake considered to be safe for long-term consumption. Analyses indicate that:

- Mean calcium intakes of WIC participant children and both groups of nonparticipant children were above the AI. This indicates that the prevalence of adequate usual intakes is likely to be high for all three groups.

- Mean fiber and potassium intakes were below the AI for WIC participant children and both groups of nonparticipant children.

- Usual daily sodium intakes were of concern for all children. Mean sodium intakes were twice the UL for WIC children and 87 percent of WIC children had usual daily sodium intakes that exceeded the UL. Similar results were found for both groups of nonparticipant children.

Macronutrients

The 2005 DGA and MyPyramid Food Guidance system recommend a particular distribution of calories from energy-providing macronutrients—total fat, saturated fat, carbohydrate, and protein. Usual daily intakes of total fat, protein, and carbohydrate were compared to Acceptable Macronutrient Distribution Ranges (AMDRs) defined in the DRIs (IOM, 2006). Usual daily intakes of saturated fat were compared to the 2005 *Dietary Guidelines for Americans* (DGA) recommendation (USDHHS/USDA, 2005).

Results show that:

- In general, WIC children and both groups of nonparticipant children had usual daily intakes of energy from fat, carbohydrate, and protein that were within acceptable ranges. However, the DRIs recommend a decrease in intake of total fat as children age, from 30-40 percent of energy for 1-3-year-olds to 25-35 percent of calories for 4-year-olds. Mean intake of total fat as a percent of energy was fairly consistent across ages, so larger proportions of 4-year-olds had usual fat intakes that exceeded recommendations.

- WIC children and both groups of nonparticipant children obtained too many calories from saturated fat. Overall, only 12 percent of children ages 2 to 4 had usual daily intakes of saturated fat that met the DGA standard.

Discretionary calories from solid fats and added sugars (SoFAAS)

Dietary patterns recommended in the DGA and *MyPyramid Food Guidance System* include specific discretionary calorie allowances based on energy needs for age and gender groups. Discretionary calories are defined as calories that can be used flexibly after nutrient requirements are met (Britten, 2006). These allowances assume that individuals satisfy nutrient requirements with the fewest possible calories by eating foods in their most nutrient-dense form (fat-free or lowest fat form, with no added sugars) (Basiotis et al., 2006). Discretionary calories may be used to consume additional amounts from the basic food groups or to consume less nutrient-dense foods that provide calories from solid fats, alcoholic beverages, added sugars (SoFAAS).

MyPyramid includes a discretionary calorie allowance of 165 calories per day (13 percent of daily calorie needs) for children age 2-3-years-old and

170 calories per day (17 percent of daily calorie needs) for 4-year-olds. (Discretionary calorie allowances are not defined for 1-year-olds.) Overall, children ages 2-4 obtained an average of 37 percent of their daily energy intakes from solid fats and added sugars (Figure 2). This percentage is far in excess of the recommended 13 or 17 percent. WIC children obtained a significantly smaller proportion of energy from solid fats and added sugars than income-eligible nonparticipant children (36 vs. 39 percent).

Are WIC Children More Likely to Be Overweight than Nonparticipant Children?

Examining whether children are healthy weight or overweight indicates whether long term energy intakes are consistent with energy requirements. Children ages 2-4 are determined to be underweight, healthy weight, at risk of overweight, or overweight based on comparison of their Body Mass Index (BMI) with gender-specific BMI-for-age growth charts developed by the Centers for Disease Control and Prevention (BMI-for-age growth charts begin at age 2). BMI is a measure of the relationship between weight and height.

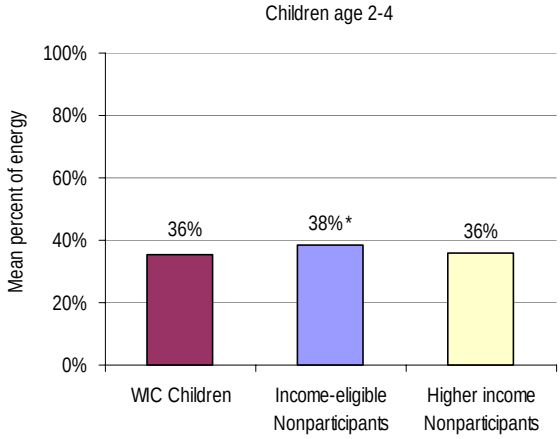
Using BMI to assess the appropriateness of usual energy intakes is recommended by the Institute of Medicine because of the difficulties associated with comparing daily energy intakes to estimated energy requirements without adequate information about physical activity (IOM, 2005b). Mean daily energy (calorie) intakes are examined in this report (Chapter 3). But estimated daily energy requirements for children age 1-4 have a wide range: 1,000 calories for sedentary children and 1,000 to 1,400 calories for moderately active and active children.

The percentages of WIC participants and nonparticipants with BMI above the healthy range are shown in Figure 3:

- Roughly 20 percent of WIC children and nonparticipant children 2 to 4 years of age were overweight or at risk of overweight. This indicates that some children in all groups were consuming more calories than they need on a regular basis.

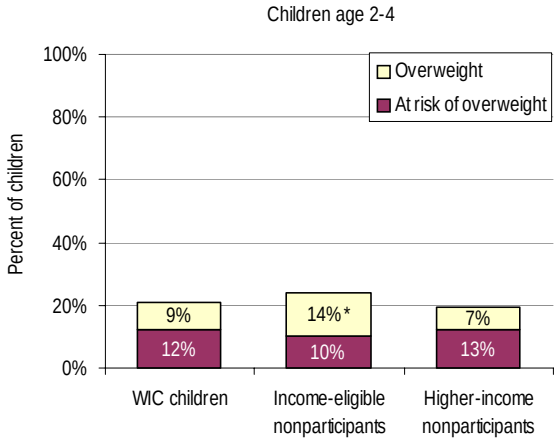
- The percentage of children with BMI above the healthy range was comparable for WIC children and higher-income nonparticipant children. In comparison with income-eligible nonparticipant children, however, WIC children were less likely to be overweight (9 vs. 14 percent). The problem of overweight was most severe (20 percent) among four-year-old income-eligible nonparticipant children.

Figure 2—Percent of Energy from Solid Fats and Added Sugars (SoFAAS)[a]



[a] SoFAAS is the acronym for solid fats, alcoholic beverages, and added sugars. Alcohol consumption was zero for this age group.
* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Figure 3—Percent of Children Who are Overweight or At Risk of Overweight[a]



[a] Weight categories are based on BMI relative to percentiles of the CDC BMI-for-age growth charts (see Chapter 3).
* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

How Does Diet Quality Compare for WIC Children and Nonparticipant Children?

In this report, we used two measures to assess overall diet quality.

- We used the Healthy Eating Index (HEI)-2005, developed by the USDA Center for Nutrition Policy and Promotion (CNPP), to assess compliance with the diet-related recommendations of the 2005 DGA and the MyPyramid food guidance system.

- We used a composite measure of nutrient density to assess the nutrient content of foods relative to their energy content. We assessed nutrient density of overall diets and individual meals and snacks. "Nutrient-dense" foods are defined as "low-fat forms of foods in each food group and forms free of added sugar."

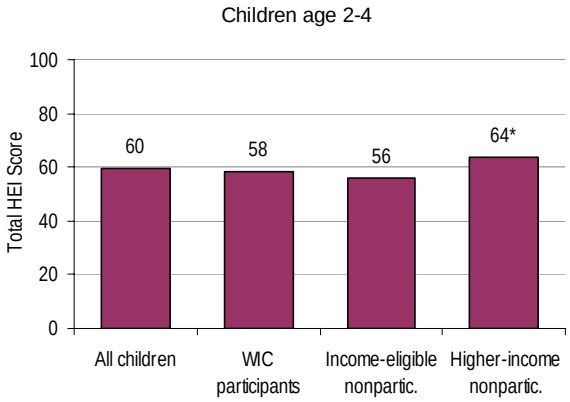
The Healthy Eating Index-2005 (HEI-2005)

The HEI-2005 consists of 12 component scores that measure consumption of food and nutrients relative to *MyPyramid* recommendations and the DGA. Eight components are food-based and assess intakes of *MyPyramid* food groups and subgroups. The four remaining components assess intakes of oils; saturated fat; sodium; and calories from SoFAAS.

HEI-2005 component scores are assigned based on a density approach that compares intakes per 1,000 calories to a reference standard. This approach reflects the overarching recommendation of the DGA and *MyPyramid* that individuals should strive to meet food group and nutrient needs while maintaining energy balance. Scores for the food-based and oils components reward greater consumption, up to a maximum score of 5 or 10 points per component. Scores for saturated fat, sodium, and calories from SoFAAS reward low consumption. Scores on the 12 components are summed for the Total HEI Score, worth a maximum of 100 points.

HEI-2005 scores were examined only for children 2-4-years-old because the DGAs and MyPyramid apply to individuals age 2 and above.

Figure 4—Healthy Eating Index-2005 (HEI-2005): Total HEI Scores



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

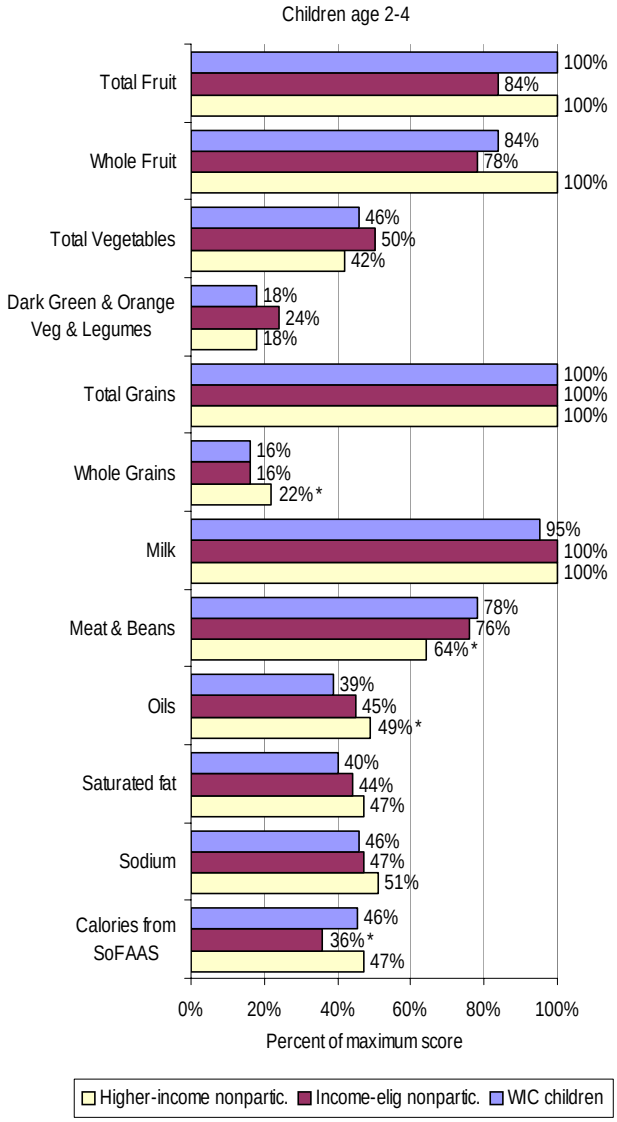
Overall, children ages 2-4 scored 60 out of a possible 100 points on the Total HEI Score. The overall score for WIC children and income-eligible nonparticipant children was not significantly different. WIC children, however, had an overall score that was significantly below that of higher-income nonparticipant children (58 vs. 64 out of a possible 100) (Figure 4).

HEI-2005 component scores are shown in Figure 5, expressed as a percentage of the maximum score per component. WIC participants and both groups of nonparticipants achieved maximum scores on Total Grains. Higher-income nonparticipant children also achieved maximum scores on Total Fruit, Whole Fruit, and Milk. All three groups of children scored at or below 50 percent on 6 components: Total Vegetables, Dark Green and Orange Vegetables and Legumes; Whole Grains; Oils; Saturated Fat; and Calories from SoFAAS.

WIC children had significantly higher mean scores than income-eligible children for the Total Fruit and Calories from SoFAAS components. Compared to higher-income nonparticipant children, WIC children had significantly lower mean scores for the Whole Grains and Oils components; and a significantly higher mean score for the Meats and Beans component.

Total HEI-2005 scores indicate that the diets consumed by all groups of children were not

Figure 5—Healthy Eating Index-2005: Component Scores



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

consistent with DGA and MyPyramid recommendations. HEI scores on Dark Green and Orange Vegetables and Legumes, and Whole Grains were the most in need of improvement for both WIC participants and nonparticipants. Scores for the Total Vegetables component were also a concern. In addition, children's intakes of saturated fat, sodium, and calories from SoFAAS were high.

Nutrient density of overall diets, meals, and snacks

To assess nutrient density, we used a modified version of the Naturally-Nutrient-Rich (NNR) score, developed by Drewnowski (2005). The NNR is a nutrients-to-calories ratio that considers nutrients commonly included in efforts to define healthy diets. The NNR, as initially conceived, excludes fortified foods. For our analysis, we used a modified NNR—the NR (Nutrient-Rich) score—that includes fortified foods because these foods make important contributions to nutrient intakes. The NR score measures the contributions of 16 nutrients (see Chapter 4). The NR score is difficult to interpret on its own, but provides a metric for comparing foods, meal, or overall diets.

For overall diets, WIC children had a significantly higher mean NR score than income-eligible nonparticipants and a mean score that was comparable to that of higher-income nonparticipant children. To understand the source of differences in overall nutrient density, we examined the nutrient density of individual meals and snacks. Compared with income-eligible nonparticipant children, WIC participants had higher NR scores for foods consumed at lunch and dinner (Figure 6). NR scores for foods consumed at breakfast and snacks were not significantly different for the two groups.

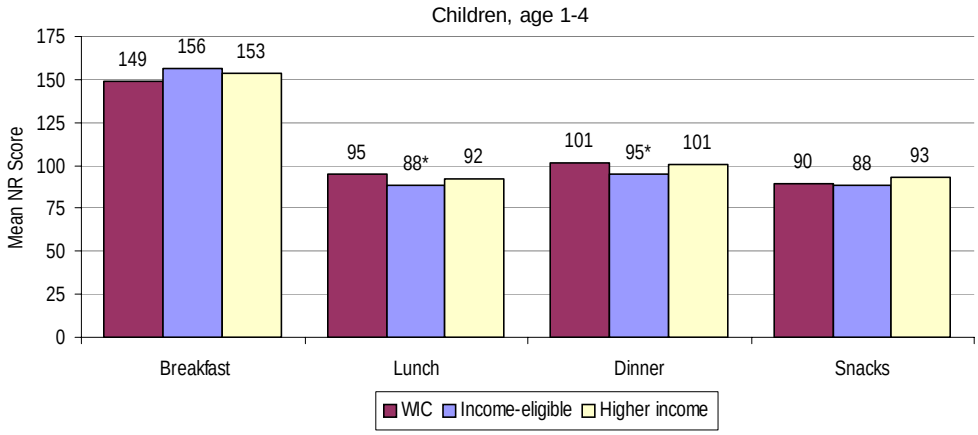
How Do Food Choices Differ for WIC Participant Children and Nonparticipants?

Analyses of food choices helps us to understand the avenues by which WIC children and nonparticipant children obtain different levels of diet quality. It can also reveal dietary behaviors that can be targeted by WIC nutrition education efforts.

Because the WIC program provides direct benefits in the form of specific foods, we began our analyses of food choices by examining consumption of food items included in the WIC food package for children. We then used two different approaches to compare the broad range of food choices of WIC participants and nonparticipants based on a single 24-hour recall:

- Types of foods consumed (supermarket aisle approach)—This approach looks at the percentage of WIC children and nonparticipant children who consumed foods from broad food groups and subgroups.

Figure 6—Nutrient Rich (NR) Scores for Meals and Snacks



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

- Nutritional quality approach—This approach examines the percentage of foods consumed by WIC children and nonparticipant children within three broad groups based on nutritional characteristics—foods suggested for frequent, selective, or occasional consumption.

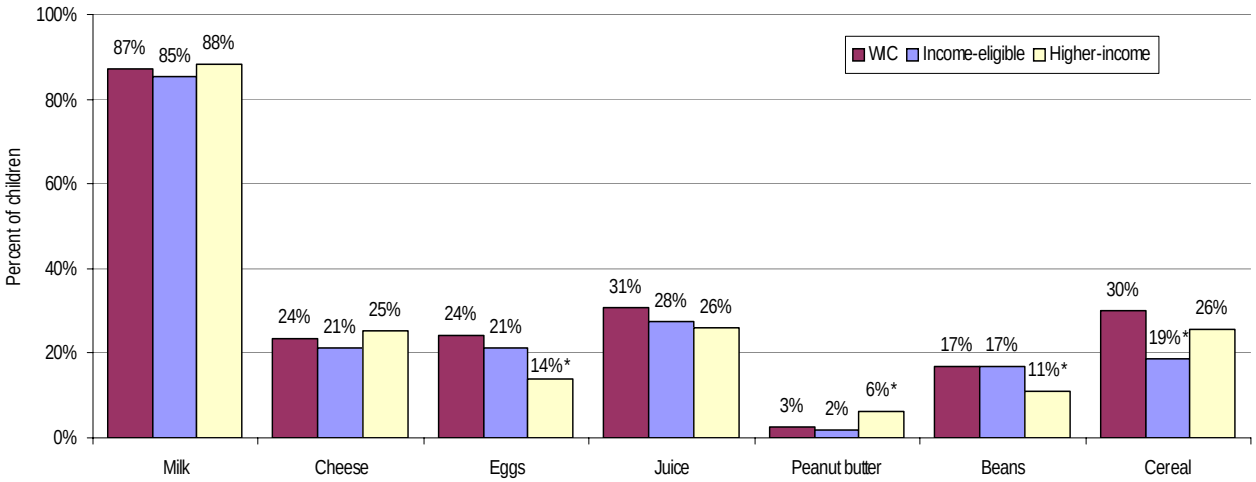
Consumption of WIC foods

WIC benefits include supplemental foods (food packages) provided in the form of checks or vouchers for redemption at authorized retailers. WIC checks/vouchers indicate the type and quantity of food that may be purchased.

As noted earlier, WIC food packages are in the process of revision. WIC children currently receive foods in five categories: juice, cereal, milk and/or cheese, eggs, and legumes (dried beans or peanut butter). Compared to existing food packages, the revised food packages for children will contain reduced quantities of some foods (juice, milk/cheese, and eggs) while adding new foods (fruits and vegetables, and whole grain/bread products).

WIC foods are provided on a monthly basis and are intended to "supplement" participants' food intakes. The NHANES data were examined to determine the proportion of WIC children and nonparticipant children who consumed foods from WIC food groups on the intake day. Results are shown in Figure 7.

Figure 7—Percent of Children Consuming WIC-Approved Foods on the Intake Day, By Food Group



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

- Comparable percentages of WIC children and both groups of nonparticipant children consumed foods from the following WIC food groups: milk, cheese, and juice.

- WIC children were more likely than income-eligible nonparticipant children to consume iron-fortified, low-sugar breakfast cereals approved by the WIC program.

- WIC children were more likely than higher-income nonparticipant children to consume eggs and dry beans, and less likely to consume peanut butter.

Types of Foods Consumed

We examined the proportions of WIC children and nonparticipant children consuming foods from each of 10 major food groups (food groups are shown in Figure 8). Compared with income-eligible nonparticipant children, WIC children were more likely to consume fruit or 100% fruit juice.

Compared with higher-income nonparticipants, WIC children were:

- Less likely to consume fruit or fruit juice (80 vs. 86 percent), milk products (89 vs. 94 percent), sweets and desserts (77 vs. 84 percent), and added fats and oils (28 vs. 37 percent).

- More likely to consume beverages other than milk, 100% juice, and water (66 vs. 55 percent).

Examination of food choices within food group identified some common food choice patterns of concern for WIC children. Compared with higher-income nonparticipants, WIC children made the following less healthful food choices:

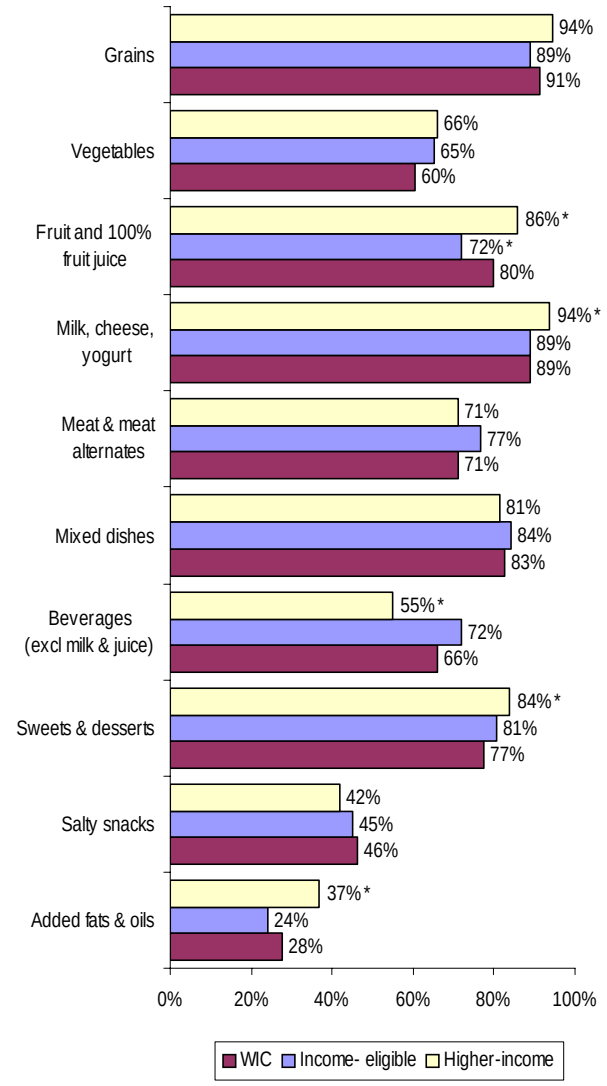
- WIC children were less likely than higher-income nonparticipants to consume whole grains (25 vs. 41 percent), which are included in the revised WIC food packages.

- Among 2-4-year-olds, for whom consumption of reduced-fat milks are recommended, WIC children were less likely than higher-income nonparticipants to consume reduced-fat milks (26 vs. 53 percent) and more likely to consume whole milk (58 vs. 32 percent). Reduced-fat milks are included in the revised WIC food packages.

- WIC children were less likely than higher-income nonparticipants to consume any whole fruit (fresh, canned, or dried) (52 vs. 69 percent) or fresh fruit (45 vs. 61 percent).

- WIC children were more likely than higher-income nonparticipants to consume regular soft drinks (36 vs. 22 percent).

Figure 8—Percent of Children Eating Any Foods from 10 Broad Food Groups



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Nutritional Quality of Foods Consumed

Our second method for examining food choices was based on the radiant pyramid/power calories concept, as described by Zelman and Kennedy (2005) (Figure 9). The idea is that foods within a food group are ranked by nutrient density, with the most nutrient-dense food choices at the bottom of the pyramid to be enjoyed frequently; foods with lower nutrient density in the middle of the pyramid to be enjoyed selectively; and the least nutrient-dense foods at the top of the pyramid to be enjoyed only occasionally. We classified foods into these three categories based on characteristics encouraged in the DGAs and MyPyramid Food Guidance System; for example, forms that are fat-free, low-fat, and/or have no added sugar are at the bottom of the pyramid. For some foods, data on total fat content and calories from SoFAAS was used to categorize foods within food group.

Analyses of the nutritional quality of foods consumed showed that:

- Over half of the foods consumed by WIC children and nonparticipant children were foods suggested for occasional consumption. Differences between groups were significant but small in magnitude (Figure 10).

- WIC children consumed more nutritious foods in the grain group (perhaps due to the influence of WIC cereals), but less nutritious foods in the milk group (due to consumption of whole milk).

Conclusions and Implications for WIC Nutrition Education

A primary conclusion from these analyses is that the diets of children who participate in the WIC program were generally comparable to the diets of children who do not participate in the program, in terms of nutrient intakes and overall diet quality. Where differences were observed, they tended to favor children who participated in WIC, relative to

Figure 9—Radiant Pyramid Concept

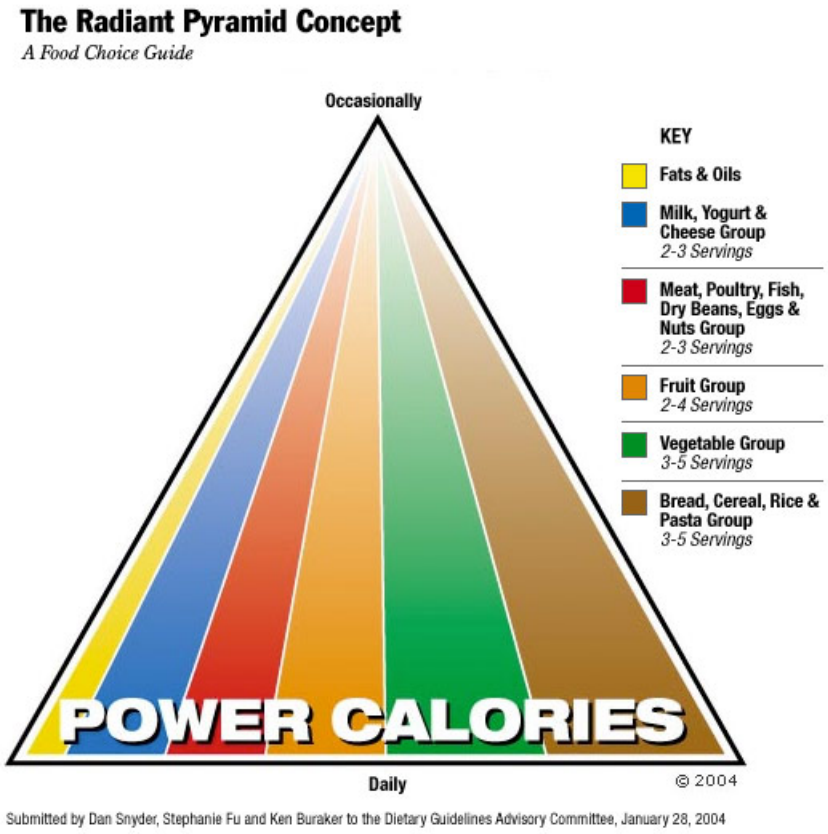
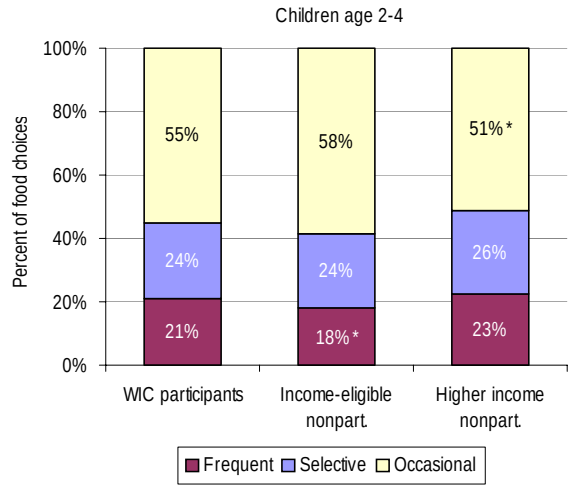


Figure 10—Percent of Food Choices From Foods Suggested for Frequent, Selective, or Occasional Consumption



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted

income-eligible children who did not participate in the program. For example, compared to WIC children, income-eligible nonparticipant children were more likely to be overweight and they obtained a significantly larger percentage of their total energy intake from solid fats and added sugars.

This does not mean that there is no need for improvement in the diets of WIC children. Rather, it means that the improvements needed in the diets of WIC children are largely comparable to those needed in the diets of other children ages 1 to 4. Observations that may be of particular interest to WIC nutrition educators include the following.

First, an important focal point for WIC nutrition education efforts is children's intakes of saturated/solid fats and added sugars. Decreased intakes of foods that are major contributors of these dietary constituents would improve the overall healthfulness of children's diets and reduce consumption of excess calories. The latter is essential for reducing the prevalence of overweight and obesity. The fact that usual fat intakes of 4-year-olds are beginning to resemble those of older children and adults suggests that this age group may be particularly important. However, because children's taste preferences and habits develop over time, it is important to work with caregivers and parents to establish and maintain healthful eating habits from very young ages.

- A useful target for efforts to decrease fat intake is whole milk. Children 2 years and older should receive reduced-fat or fat-free milk, consistent with the revised WIC food packages. More than half of WIC children ages 2-4 consumed unflavored whole milk, compared with only 26 percent consuming unflavored reduced-fat milk. Whole milk contributed 14 percent of the solid fat consumed by WIC children.

- Sweetened beverages are an appropriate target for efforts to decrease intake of added sugars. Dietary recalls for 56 percent of WIC children included one or more sweetened beverages (noncarbonated sweetened beverage or regular soft drink), and almost 40 percent of added sugar intake came from sweetened beverages.

Second, to improve fiber intakes, parents and caregivers of WIC children should be encouraged to offer more whole grain products (only 10 percent of total grain intake was whole grains), whole fruits rather fruit juice (almost 60 percent of total fruit intake was from juices), and offer a wider variety of vegetables (almost 50 percent of total vegetable intake was provided by white potatoes).

Chapter 1
Introduction

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides nutrient-dense foods, nutrition education, and referral to health care services for low-income pregnant women, breastfeeding and non-breastfeeding postpartum women, infants, and children up to age five who are at nutritional risk. When the program was created in 1972, the primary goal was to combat malnutrition and under-nutrition during the critical period of early childhood growth and development. WIC food benefits comprise the largest component of program costs, and are provided to WIC participants through vouchers redeemable at authorized retailers. WIC food packages were designed to provide foods high in one or more of the nutrients found lacking in the diets of low-income Americans: protein, calcium, iron, and vitamins A and C.

WIC food packages have been largely unchanged from the program's inception until recently.[1] In 2005, proposed changes to WIC food packages were introduced as a result of a comprehensive review by the Institute of Medicine (IOM), at the request of the U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) (Institute of Medicine (IOM), 2005a). The final changes were published in an Interim Rule in the Federal Register on December 6, 2007.

In *WIC Food Packages: Time for a Change*, the IOM cites four major trends as the impetus for revising WIC food packages:

- Demographic changes in the WIC population,
- Increased variety in the food supply,
- Changes in food consumption patterns, and
- Changes in the health risks of the WIC-eligible population.

Compared to the 1970s, women and children applying to the WIC program today are far less likely to be undernourished and more likely to be overweight. While there is no evidence that WIC participation contributes to the risk of overweight, the IOM noted that several WIC food packages provided more than the recommended amounts of milk or milk products and fruit juice. In addition, WIC packages did not reflect variety in the food supply by providing whole fruit and vegetables, and encouraging whole grains (IOM, 2005a). Proposed changes in WIC food packages will align WIC foods with the *2005 Dietary Guidelines for Americans* (U.S. Department of Health and Human Services and USDA, 2005) and infant feeding practice guidelines of the American Academy of Pediatrics (AAP, 2005).

This report uses the most recently available data from the National Health and Nutrition Examination Survey (NHANES 1999-2004) to provide a comprehensive picture of the diets of WIC participant children age 1-4 years old—the largest segment of the WIC population—prior to the revision of WIC food packages. Women and infants are not examined. NHANES samples of women are too small to provide statistically reliable estimates for subgroups of WIC participants and nonparticipants.[2] Many of the food choice and diet quality measures used for this report do not apply to infants.

The report examines the nutrient intakes and food choices of WIC participant children and two groups of nonparticipant children—those who were income-eligible for WIC but did not participate in the program, and higher-income children who were not eligible for the program. We analyze usual nutrient intakes, diet quality, and food choices—including consumption of WIC-approved foods. The report provides a reference for comparison with future NHANES data collected after the revised food packages are fully implemented.

This research was not designed to assess the impact of WIC or in any way attribute differences observed between WIC participants and nonpar-

[1] In 1980, the WIC food packages were revised to add beans and peanut butter.

[2] The total numbers of women categorically eligible for WIC and having complete dietary recalls in NHANES 1999-2004 is 856 pregnant, 134 breastfeeding, and 338 postpartum. However, each subgroup of income-eligible and higher-income nonparticipant breastfeeding and postpartum women has 63 or fewer women.

ticipants to an effect of the program. Estimation of program impacts requires a randomized experiment or quasi-experimental design to control for selection bias (Hamilton and Rossi, 2002). A quasi-experimental study design was not feasible due to limitations of the NHANES data. In this report, data on nonparticipant children are presented strictly to provide context for data on WIC participant children. For example, it is useful to understand the extent to which dietary patterns observed in the diets of WIC participants mirror those observed in other population groups.

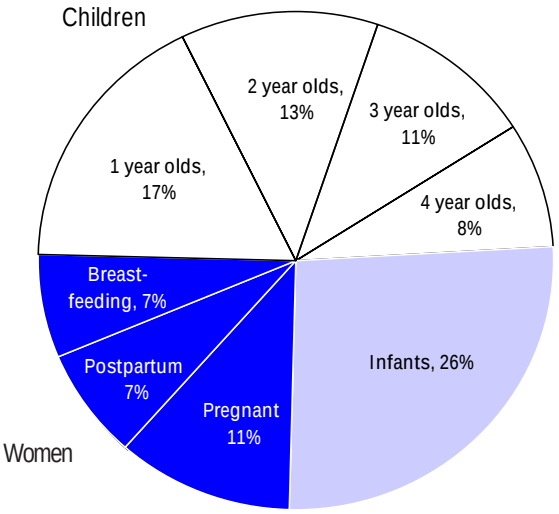
This introductory chapter provides an overview of the WIC Program as well as a brief description of the data and methods used in this study. The five chapters that follow present findings on usual daily intakes of vitamins, minerals, and fiber (Chapter 2), energy intakes (Chapter 3), meal and snack patterns (Chapter 4), food choices (Chapter 5), and scores on the Healthy Eating Index-2005 (Chapter 6).[3]

The WIC Program

WIC is the third largest federally funded food and nutrition assistance program in the United States (behind the Food Stamp Program and National School Lunch Program). In FY2007, the WIC program served a monthly average of nearly 8.3 million persons at an annual cost of 5.45 billion dollars. Food costs accounted for $3.89 billion, or 71 percent of program costs.[4]

About half of the WIC caseload is children, 25 percent infants, and 25 percent women (Figure 1-1). In FY2006, almost half of all infants in the U.S. participated in the WIC program, along with about one-quarter of all children 1-4 years of age.[5]

Figure 1-1—Distribution of WIC Participants by Eligibility Category



Source: Bartlett et al. (2007). *WIC Participant and Program Characteristics, 2006.*

WIC eligibility

Applicants to WIC must reside in the State where they apply to the program and they must meet three eligibility criteria: categorical eligibility, income or adjunct eligibility, and be individually determined to be at "nutrition risk" by a health professional. There are five categories of WIC eligibility corresponding to five categories of WIC participants shown in Figure 1-1 (pregnant women, breastfeeding women, postpartum women, infants, and children).

In 2006, 66 percent of WIC enrollees were adjunct eligible due to enrollment (own or family member) in the Food Stamp Program (FSP), Temporary Assistance to Needy Families (TANF), or Medicaid.[6] WIC enrollees who are not adjunct eligible must be determined to have gross countable family income at or below 185 percent of the federal poverty level.

Nutrition risk includes medical-based and dietary-based conditions. Nutrition risk may be established

[3] Chapter 3 includes an assessment of the appropriateness of long-run usual energy intakes, based on Body Mass Index (BMI) and the prevalence of overweight.

[4] FY2006 data, current as of April 26, 2007: www.fns.usda.gov/pd/wisummary.htm.

[5] Bartlett, et. al (2007) and "Projected Population of the United States, by Age and Sex: 2000 to 2050" http://www.census.gov/ipc/www/usinterimproj/.

[6] In 2006, 63.2 percent of WIC participants reported participation in Medicaid, 21.8 percent reported FSP participation, and 9.3 percent reported TANF participation. Overall, 66.2 percent received benefits from at least one adjunct program; only 6.1 percent reported participation in all three programs (Bartlett, et al., 2007).

by an applicant's physician, or by the WIC clinic where the applicant's height and weight are measured and blood taken to check for anemia. Medical-based conditions include anemia, underweight, maternal age, history of pregnancy complications or poor pregnancy outcomes. Dietary-based conditions include inappropriate dietary patterns and inadequate diet. In 1999, USDA established a single list of nutrition risk criteria to provide standardization across states. These criteria were based on recommendations from a review by the Institute of Medicine (IOM, 1996). The National Research Council (NRC) found, however, that "it appears that very few income-eligible people fail to meet at least one of the nutrition risk criteria" (NRC, 2001).

Food benefits

WIC benefits include supplemental foods, nutrition education, and breastfeeding and immunization promotion and support (if applicable). WIC foods are intended to "supplement" participants' food intakes. In most States, supplemental food benefits are provided in the form of checks or vouchers for redemption at authorized retailers (mainly supermarkets and large grocery stores).[7] Each State WIC agency designates specific brands and package sizes of foods approved for WIC redemption, according to the nutrition content of the specific item and the cost containment goals of the State agency. For example, all States negotiate infant formula rebates with manufacturers and some may also negotiate rebates on other items; package sizes may be limited to larger sizes with lower unit cost.[8]

As noted earlier, WIC food packages are in the process of revision. Changes for women and children will provide more of the nutrients that tend to be under-consumed by the WIC target population, and less of the nutrients that tend to be over-consumed, while providing more variety and more options to adapt food prescriptions to an increasingly diverse population (IOM, 2005a).[9] Changes for infants and breastfeeding women are intended to align infant feeding practices with current recommendations and promote breastfeeding.

WIC children currently receive foods in five categories: juice, cereal, milk and/or cheese, eggs, and legumes (dried beans or peanut butter). Compared to existing food packages, the revised food packages for children will contain reduced quantities of some foods (juice, milk/cheese, and eggs) while adding new foods (fruits and vegetables, and whole grain/bread products).

While WIC benefits are provided to individuals based on individual eligibility, WIC foods may be consumed by other family members. This spillover effect cannot be examined with NHANES data because it is not possible to link family members.[10]

Nutrition education

WIC nutrition education is made available to all program participants. Current regulations require that, during each six-month certification period, at least two nutrition education contacts are offered to each adult WIC participant and to parents or caretakers of infant and child participants. Supplemental food benefits, however, may not be denied to participants who decline to participate in nutrition education.

As specified in the regulations (7CFR246.11), WIC nutrition education has two broad goals:

- Stress the relationship between proper nutrition and good health with special emphasis on the nutritional needs of program participants, and raise awareness about the dangers of using

[7] The WIC Program authorized 49,260 vendors in FY2005, These included retail establishments (90 percent), pharmacies (6.5 percent), WIC-only stores (2.3 percent), and commissaries (0.3 percent) (USDA/FNS, 2006). Retail establishments were not reported by type. Based on 1999 data, Kirlin and Cole (2001) found that 63 percent of retail WIC vendors were supermarkets, 26 were grocery stores, and 12 percent were other retailers.

[8] In 2000, 10 States received manufacturer rebates on infant cereal and/or infant juice. One of the 10 States also received manufacturer rebates on adult juices (Kirlin and Cole, 2001).

[9] The Interim Rule published by USDA/FNS in the Federal Register on December 6, 2007 allows implementation of the revised WIC food packages, and sets a deadline of August 5, 2009 to complete implementation.

[10] Oliveira and Chandra (2005) examined spillover effects in their study of WIC participants' consumption of WIC foods by comparing WIC participants to eligible nonparticipants in WIC households. They found that WIC participants consumed significantly more WIC-approved cereal and juice, compared with eligible nonparticipants in WIC households.

drugs and other harmful substances during pregnancy and while breastfeeding.

- Assist the individual who is at nutritional risk in achieving a positive change in food habits, resulting in improved nutritional status.

Local WIC agencies offer both individual and group nutrition education sessions covering the general topics of food economics, food safety, general nutrition, maternal nutrition, infant feeding, child feeding, and breastfeeding. Within these broad topics, classes deal with specific topics such as navigating the grocery store, smart snacking, portion awareness and childhood obesity. Local WIC agencies employ registered dieticians and certified WIC nutrition assistants (paraprofessionals) to provide nutrition education.

The National Health and Nutrition Examination Survey

This report is based on data from the NHANES 1999-2004, supplemented by data from the MyPyramid Equivalents Database which is compiled by USDA's Agricultural Research Service (ARS).

NHANES is conducted by the National Center for Health Statistics (NCHS) and is designed to provide national estimates of the health and nutrition status of the civilian, non-institutionalized population in the 50 United States. The survey includes interviews, physical examinations, and laboratory tests. Beginning in 1999, NHANES is a continuous annual survey with data released in public data files every two years. Most of the analyses in this report are based on six years of survey data from NHANES 1999-2004.

NHANES dietary interview data

This study relies primarily on data from the NHANES 24-hour dietary recall interview, which collects quantitative data on foods and beverages consumed during the preceding 24 hours. The NHANES dietary interview is conducted in-person using a computer-assisted dietary interview (CADI) system with a "multiple pass" approach to facilitate respondent recall of all foods and beverages consumed in the preceding 24 hours.[11, 12]

In survey years 1999-2002, NHANES conducted a single 24-hour recall for each respondent. Beginning in 2003, NHANES conducts a second follow-up dietary interview, by telephone, 3 to 10 days after the initial dietary interview. These "second day recalls" provide data needed to estimate the distribution of usual daily nutrient intakes, controlling for average day-to-day variance in nutrient intakes of individuals. For this study, data from the "second day recalls" collected in 2003-04 were used to estimate variance components (individuals' day-to-day variance). These variance components were then used to estimate distributions of usual daily nutrient intakes for the complete 1999-2004 NHANES sample.

NHANES dietary recall data for children are based on survey responses of parents or guardians. The dietary intake data are processed using a separate nutrient database program known as Survey Net, which incorporates data on nutrient values from USDA's Food and Nutrient Database for Dietary Studies (FNDDS). The NHANES public data release includes a food level file (containing one record for each food item reported by each respondent) and a total nutrient file (containing one record per respondent with total nutrient intakes for the day).

NHANES interview and examination data

In addition to dietary recall data, this study uses data collected through the NHANES household interview, examination survey, and physical examination. This includes information on person characteristics (WIC program participation, age, and sex), dietary supplement use, and body measurements (height and weight). These data are described in Appendix A.

[11] In 1999 and 2000 a small subsample of respondents completed dietary interviews via telephone as part of a methodological study (the Dietary Interview Mode Evaluation Study (DIMES)) to test the operational feasibility of the telephone interview mode.

[12] The multiple passes include: a) quick list of foods, without interviewer interruption; b) reporting of the time, place, and eating occasion for each food; c) specific probes about food details; and d) a final review of reported foods in chronological order.

MyPyramid Equivalents Database for USDA Survey Food Codes

Data from the MyPyramid Equivalents Database were used to estimate scores on the Healthy Eating Index-2005 (HEI-2005) and to assess sources of MyPyramid food group intakes. The HEI-2005 was developed by the USDA Center for Nutrition Policy and Promotion (Guenther, et al., in press). HEI-2005 is a measure of diet quality with 12 component scores that assess intakes of food groups and selected nutrients relative to dietary patterns recommended in the MyPyramid Food Guidance System (USDA, CNPP, 2005) and the 2005 Dietary Guidelines for Americans (USDHHS/USDA, 2005).

MyPyramid, which replaced the Food Guide Pyramid introduced in 1992, provides recommendations about the types and quantities of foods individuals age 2 and older should eat from different food groups (grains, vegetables, fruits, milk, meat and beans), tailored to individuals' age, gender, and activity level. Guidance is also provided about managing discretionary calories, which may come from oils, solid fats, added sugar, and alcohol.

The MyPyramid database contains files corresponding to the NHANES individual food files (one record per food) and NHANES total nutrient files (one record per person, with total daily intake).[13] MyPyramid data are expressed in cups or 'cup equivalents' for vegetables, fruit, and milk products; in ounces or 'ounce equivalents' for grains, and meat and beans; in grams for discretionary fats, teaspoons for added sugar, and in drinks for alcohol.

MyPyramid data are available for single day intakes for respondents age 2 and above, corresponding to NHANES survey years 1999-2002. As a result, all analyses of HEI-2005 and sources of MyPyramid food group intakes in this report are limited to children age 2-4 for the 4-year period (1999-2002).

[13] MyPyramid Equivalents Database for USDA Survey Food Codes, 1994-2002,Version 1.0 contains data corresponding to NHANES 1999-2000 and 2001-02, and CSFII 1994-96, 1998. MyPyramid data corresponding to NHANES 2003-04 were not available at the time this study was conducted.

NHANES Samples for Tabulation

This report contains tabulations of dietary measures for WIC participant children and nonparticipant children age 1-4 years. As noted above, women are not included because sample sizes for subgroups of WIC participants and nonparticipants are too small to yield statistically reliable estimates.[14] Infants are not included because many of the food choice and diet quality measures do not apply to them.

WIC participants were identified as children receiving WIC benefits at the time of the survey ("Is {Sample Person} now receiving benefits from the WIC program?"). Children reported as not receiving WIC benefits at the time of the survey were considered nonparticipants. Nonparticipants were subdivided into those who were income-eligible for WIC (household income at or below the WIC cutoff of 185 percent of poverty) and those whose income exceeded the eligibility standard (income above 185 percent of poverty).

All analyses in this report are based on NHANES respondents with complete dietary recalls. Sampling weights for this subsample of the NHANES population are discussed in Appendix A. Tabulations of WIC participant and nonparticipant children are provided by year of age and overall. Sample sizes and weighted population counts for the groups of WIC participants and nonparticipants are shown in Table 1-1. NHANES 1999-2004 includes a sample of 2,586 children age 1 to 4 years old. The percentage of children participating in WIC decreases with age, from 36 percent of one-year-olds to 20 percent of 4-year-olds (Figure 1-2).

Characteristics of WIC participant and nonparticipant children

Table 1-2 presents demographic data for WIC participants, income-eligible nonparticipants, and higher-income nonparticipant children. Compared with higher income nonparticipant children, WIC

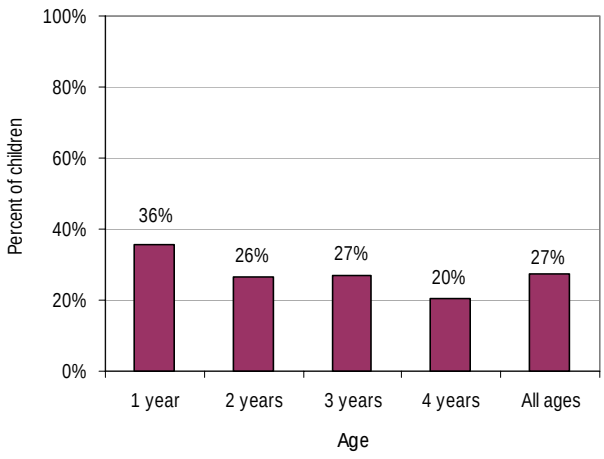
[14] In addition to the small samples noted previously, women's reported WIC participation may not be reliable. The total population count of women reporting WIC participation overestimates administrative counts by a factor of 1.7. It is possible that women reported themselves as WIC participants when their infant or child was enrolled.

Table 1-1—NHANES Respondents with Complete Dietary Recalls, 1999-2004: Sample Sizes and Weighted Population Counts for Children Age 1-4 Years

	All Children		WIC Children		Income-eligible Nonparticipating Children		Higher-income Nonparticipating Children	
	Sample size	Population	Sample size	Population	Sample size	Population	Sample size	Population
Children								
1 year old	785	3,820,582	375	1,367,613	193	889,441	191	1,437,091
2 years old	784	3,790,446	307	999,783	219	986,252	220	1,591,508
3 years old	518	3,832,799	192	1,033,161	171	1,128,375	131	1,435,652
4 years old	499	3,926,323	132	795,451	179	1,196,856	167	1,793,881
Total	2,586	15,370,150	1,006	4,196,008	762	4,200,925	709	6,258,132

Source: NHANES 1999-2004 sample of children with complete dietary recalls. 'All Children' includes those with missing WIC participation or income.
Note: Population counts under "All children" are Census 2000 population counts by year of age. Population counts for all other columns are equal to the population total multiplied by the the weighted percent of sample in each column based on NHANES dietary recall weights. Dietary recall weights proportionately weight weekday and weekend recalls (See Moshfegh et al., 2005), but do not sum to population totals by year of age because poststratification was based on broad age groups. All estimates for "Total childen" (all ages) in this report are age adjusted estimates to weight each year of age by population counts.

Figure 1-2—Percent of Children Participating in the WIC Program, By Age



children are younger (as noted above regarding participation rates by age), and WIC children are more likely to come from every racial/ethnic minority group. Compared with income-eligible nonparticipant children, WIC children are younger, poorer, more likely to be Hispanic, and less likely to be white.

Demographic characteristics may influence dietary behaviors. The analyses presented in this report include age-adjusted estimates for comparing WIC children with nonparticipant children. Age-adjustment (discussed under analytic approach) eliminates between-group differences that are due solely to differences in the age distributions of the groups. We do not, however, control for the differences in racial/ethnic distributions of the groups, and these differences may influence dietary behaviors (Perez-Escamilla and Putnik, 2007).

Table 1-2 shows the distribution of family income relative to the poverty guidelines for WIC children and nonparticipant children, where family income is annual income reported by parents or guardians. Children are income eligible for WIC if family income is at or below 185 percent of the poverty guidelines. Over half of WIC children are in households with income below the poverty level (55 percent vs. 47 percent of income-eligible nonparticipating children); 69 percent of WIC children are in households with income potentially qualifying for food stamp benefits (income at or below 130 percent of poverty); and 12 percent are in households with income between 131 and 185 percent of poverty. Almost 12 percent of WIC children have reported household income above the WIC income cutoff of 185 percent of poverty. This may be due to adjunct eligibility through Medicaid in States with Medicaid eligibility limits

Table 1-2—Demographic Characteristics of WIC Participant and Nonparticipant Children

	All Children		WIC Children		Income-eligible Nonparticipating Children		Higher-income Nonparticipating Children	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Age								
1 year old	25.2	*(1.05)*	32.9	*(2.25)*	† 21.5	*(1.83)*	† 23.3	*(1.85)*
2 years old	26.3	*(1.22)*	25.3	*(1.85)*	25.1	*(1.65)*	27.1	*(2.09)*
3 years old	24.2	*(1.12)*	23.9	*(1.78)*	26.2	*(2.26)*	22.3	*(1.87)*
4 years old	24.3	*(1.36)*	18.0	*(2.13)*	27.2	*(2.28)*	27.3	*(2.57)*
Race/Ethnicity								
White, Non-Hispanic	59.0	*(2.19)*	40.2	*(4.82)*	52.1	*(3.57)*	77.0	*(2.36)*
Black, Non-Hispanic	13.3	*(1.33)*	17.9	*(2.24)*	† 19.2	*(2.32)*	† 5.8	*(1.12)*
Hispanic	21.2	*(1.98)*	35.6	*(4.25)*	22.6	*(2.66)*	10.6	*(1.56)*
Other race	6.5	*(0.93)*	6.3	*(1.63)*	6.1	*(1.81)*	6.5	*(1.38)*
Country of Birth								
U.S.	97.8	*(0.40)*	97.2	*(0.77)*	98.0	*(0.58)*	† 98.1	*(0.68)*
Mexico	0.7	*(0.16)*	1.2	*(0.32)*	0.9 u	*(0.33)*	0.1 u	*(0.05)*
Elsewhere	1.3	*(0.34)*	1.5 u	*(0.66)*	0.8 u	*(0.43)*	1.8 u	*(0.67)*
Family income (% of poverty)								
< 50%	12.4	*(0.92)*	23.0	*(1.60)*	† 22.1	*(2.55)*	† 0.0	
51-100%	15.7	*(0.91)*	32.1	*(2.68)*	25.1	*(2.34)*	-	
101-130%	10.0	*(0.99)*	14.2	*(1.59)*	22.8	*(2.45)*	-	
131-185%	11.8	*(0.91)*	12.4	*(1.15)*	30.1	*(2.17)*	-	
186-250%	9.3	*(1.03)*	8.1	*(1.47)*	-		17.6	*(2.54)*
> 250%	34.6	*(1.96)*	3.5	*(0.74)*	-		82.4	*(2.54)*
Not reported	6.2	*(0.77)*	6.8	*(1.53)*	-		-	
Sample size, unweighted	2,586		1,006		762		709	
Sample size, weighted	15,607,199		4,276,390		4,252,106		6,350,242	

- Value is exactly 0.
u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.
Note: Significant differences in distributions are noted by †. Differences are tested in comparison to WIC participants using chi-square tests. Percents by race, country of birth, and poverty status are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Source: NHANES 1999-2004 children with complete dietary recalls. Survey information was reported by parent or guardian. "All Children" includes those with missing WIC participation or income.

above 185 percent of poverty, or it may reflect changes in household income between the time of WIC certification and the time the NHANES data were collected.

General Analytic Approach[15]

This report provides a description of the nutrient intakes and food choices of WIC participants and nonparticipants. Descriptive statistics are provided with tests of statistical significance to indicate differences between WIC participants and each group of nonparticipants. *This research was not designed to assess program impacts or in any way attribute differences observed between WIC participants and either group of nonparticipants to an effect of the program.*

In this report, we present age-adjusted estimates to eliminate between-group differences that are due

[15] A detailed description of data and methods appears in Appendix A.

solely to differences in the age distributions of the groups. Data presented in tables with all ages combined (e.g., Table 2-1) or in rows labeled "Total, age adjusted" (e.g., Tables 2-3) are "built-up" from estimates for each year of age, standardized according to the age distribution of the U.S. population in the year 2000.

It is important to understand that age-adjusted estimates do not represent the true or raw estimates for a given population or subgroup. Rather, the age-adjusted estimates should be viewed as constructs or indices that provide information on the relative comparability of two or more populations (in this case, WIC participants and two different groups of nonparticipants) on a particular measure (U.S. DHHS, 2000). The age-adjusted estimate tells us the percentage of WIC children that would have a particular characteristic if WIC children had the same age distribution as the general population. Thus the age-adjusted estimate provides a comparison of WIC participants and nonparticipants that is *independent* of age.

Statistical tests

The statistical significance of differences between WIC participants and each group of nonparticipants was tested using t-tests or chi-square tests. Nonetheless, because of the large number of t-tests conducted, caution must be exercised in interpreting results. In general, findings discussed in the text are limited to those with strong statistical significance (1 percent level or better) or those that are part of an obvious trend or pattern in the data.

Additional information about the analytic approach, including use of NHANES sampling weights, calculation of standard errors, age standardization, and guidelines used to flag point estimates deemed to be statistically unreliable, is provided in Appendix A. Individual point estimates may be deemed statistically unreliable because of small sample size or a large coefficient of variation. In keeping with NHANES reporting guidelines, such estimates are reported in detailed tables and are clearly flagged.

The chapters that follow summarize key findings. Graphics are used to illustrate observed differences between WIC participants and nonparticipants. Differences that are statistically significant at the 5 percent level or better are indicated on the graphs. Detailed tables provided in Appendices B and C differentiate three levels of statistical significance ($p < .001$, .01, and .05).

As noted previously, this research was not designed to measure program impacts. Thus, significant differences that do appear between WIC participants and nonparticipants cannot be attributed to participation in WIC. At the same time, the absence of a significant difference cannot be interpreted as evidence that participation in the WIC has no effect. Accurate assessment of WIC impacts requires specially designed studies or, at a minimum, complex analytical models that require a variety of measures that are not available in the NHANES data.

Chapter 2
Usual Daily Intakes of Vitamins, Minerals, and Fiber

To assess the nutritional adequacy of diets consumed by WIC children and nonparticipating children, we compared usual daily intakes of vitamins, minerals, and fiber consumed in foods to the Dietary Reference Intakes (DRIs) (IOM 1997-2005).[1] The DRIs, developed by the Food and Nutrition Board of the Institute of Medicine (IOM), are the most up-to-date scientific standards for assessing diets of individuals and population groups. The DRIs define different standards for different types of nutrients and the methods used to assess usual intakes vary accordingly (see box).

ESTIMATION OF USUAL NUTRIENT INTAKES

Data

- NHANES 1999-2002: Single 24-hour recalls per person
- NHANES 2003-2004: Two separate 24-hour recalls per person

Methods*

- Estimate variance components (average day-to-day variation per person) for each nutrient and subgroup using NHANES 2003-04
- Adjust NHANES 1999-2004 single 24-hour recalls using esimated variance components

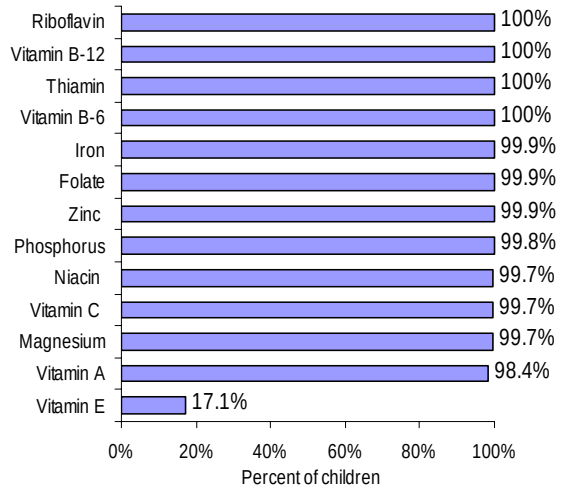
* See Appendix A.

Vitamins and Minerals with Defined Estimated Average Requirements

Estimated Average Requirements (EARs) are specified for all of the nine vitamins examined in this analysis and for four of the minerals (iron, magnesium, phosphorus, and zinc). Virtually all children 1-4 years old had adequate intakes (usual daily intakes equal to or greater than the EAR) of the vitamins and minerals with defined EARs (Figure 2-1). The one notable exception was vitamin E—only 17 percent of children age 1 to 4 had usual daily intakes of vitamin E that met the EAR. This is consistent with most recent studies of vitamin E intake. Devaney and colleagues (2007)

[1] Nutrient intake data presented do not include contributions from dietary supplements.

Figure 2-1—Percent of Children Age 1-4 with Adequate Usual Intakes



DIETARY REFERENCE INTAKES

Estimated Average Requirement (EAR): The usual daily intake level that is estimated to meet the requirement of half the healthy individuals in a life stage and gender group. The proportion of a group with usual daily intakes greater than or equal to the EAR is an estimate of the prevalence of adequate daily intakes in that population group. *[Used to assess usual daily intakes of most vitamins and minerals.]*

Adequate Intake (AI): The usual daily intake level of apparently healthy people who are maintaining a defined nutritional state or criterion of adequacy. AIs are used when scientific data are insufficient to establish an EAR. When a population group's mean usual daily intake exceeds the AI, the prevalence of inadequate usual daily intakes is likely to be low. However, mean usual daily intakes that fall below the AI do not indicate that the prevalence of inadequacy is high. [*Used to assess usual daily intakes of calcium, potassium, sodium and* fiber].

Tolerable Upper Intake Level (UL): The highest usual daily intake level that is likely to pose no risk of adverse health effects to individuals in the specified life stage group. As usual daily intake increases above the UL, the risk of adverse effects increases. [*Used to assess usual daily intakes of sodium*. ULs for other nutrients are based on intakes from supplements, and are not examined in this report.]

See Appendix A for DRI values.

Table 2-1—Prevalence of Adequate Usual Daily Intakes of Vitamins, Minerals, and Fiber

	Children age 1-4 years			
	All Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Vitamins			
Percent > EAR				
Vitamin A	98.4	97.6	97.0	99.0
Vitamin C	99.7	99.6	99.7	99.6
Vitamin B_6	100.0	99.9	99.9	100.0
Vitamin B_{12}	100.0	100.0	100.0	100.0
Vitamin E	17.1	23.5	16.0	12.9
Folate	99.9	99.9	99.8	99.8
Niacin	99.7	99.7	99.6	99.7
Riboflavin	100.0	100.0	100.0	100.0
Thiamin	100.0	99.9	99.9	100.0
	Minerals and Fiber			
Percent > EAR				
Iron	99.9	99.9	99.9	99.9
Magnesium	99.7	99.3	99.4	99.8
Phosphorus	99.8	99.7	99.8	99.9
Zinc	99.9	99.8	99.8	99.9
Mean % AI				
Calcium	172.8	167.8	172.8	176.7
Potassium	67.9	69.9	67.2	66.6
Sodium	216.5	226.4	228.2	** 199.2
Dietary Fiber	49.2	51.0	48.3	48.5
Percent > UL				
Sodium	85.7	87.0	89.6	81.0

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC at the time of the interview.
See Appendix B for standard errors of estimates and percentile distributions.
Individual estimates of 99.0% and greater are statistically unreliable due to inadequate sample size for estimating very common events.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.* Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

have pointed out that vitamin E deficiency is rare in the U.S., despite low measured intakes, and have suggested that the EAR for vitamin E may need to be reassessed.

There were no significant differences between WIC children and either income-eligible or higher-income nonparticipating children in the prevalence of adequate usual daily intakes of vitamins and minerals with defined EARs (Table 2-1).[2]

Nutrients Assessed Using Adequate Intake Levels

EARs are not defined for calcium, potassium, sodium, or fiber so it is not possible to assess the adequacy of usual daily intakes of these nutrients. Populations with mean usual daily intakes that meet or exceed the Adequate Intake (AI) levels defined for these nutrients can be assumed to have high levels of adequacy. However, no firm conclusions can be drawn about levels of adequacy when mean usual daily intakes fall below the AI.

[2] Tables providing detailed data (means, standard errors, and distributions) by year of age are provided in Appendix B.

Because excessive sodium intakes may increase risk of hypertension, sodium intakes are also assessed relative to the Tolerable Upper Intake Level (UL). Individuals with usual daily intakes that exceed the UL may be at increased risk of developing hypertension.

Calcium

Overall, mean usual daily calcium intakes of children ages 1 to 4 exceeded the AI by more than 70 percent, suggesting a high prevalence of adequate calcium intakes (Table 2-1). On average, there were no significant differences in usual daily calcium intakes of WIC children and either group of nonparticipating children (Figure 2-2).

Potassium

Mean usual daily potassium intakes of children ages 1 to 4 were equivalent to 68 percent of the AI (Table 2-1). There were no statistically significant differences between WIC children and either group of nonparticipating children in mean usual daily intakes of potassium (Figure 2-2). Given the limitations of the AI, we can draw no firm conclusions about children's risk of inadequate potassium intakes.

Sodium

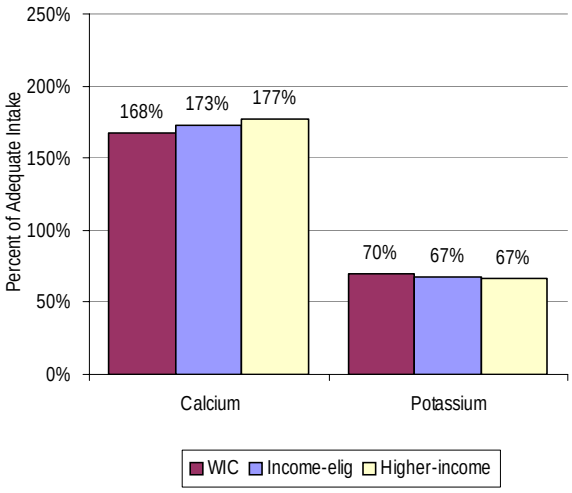
Overall, children's mean usual daily sodium intakes were more than two times the AI (Table 2-1). This indicates that there is little danger of children having inadequate intakes of sodium. In fact, 86 percent of all children ages 1 to 4 had usual daily sodium intakes that were excessive (greater than the UL).

There were no significant differences between WIC children and income-eligible nonparticipants in mean usual daily intakes of sodium or in the proportion of children with usual intakes that exceeded the UL. However, WIC children had significantly higher usual daily sodium intakes than higher-income nonparticipating children, on average (Table 2-1). There are no significant differences between WIC children and nonparticipant children in the proportions of children with usual daily sodium intakes that exceeded the UL (Table 2-1 and Figure 2-3).

Fiber

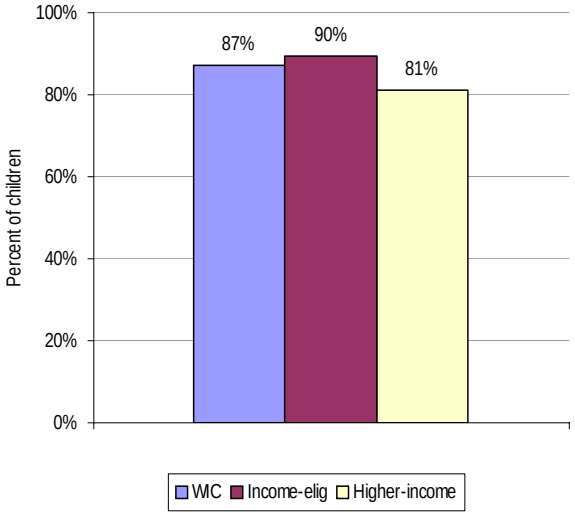
Usual daily fiber intakes were examined in two ways—(1) mean intakes, expressed as a percentage of the AI, and (2) mean intakes, expressed on a gram-per-calorie basis. The standard used to establish AIs for fiber was 14 grams per 1,000 calories, based on the median energy intake of

Figure 2-2—Mean Usual Daily Intakes as Percent of Adequate Intake (AI)—Calcium and Potassium



Differences between WIC participants and each group of nonparticipants are not statistically significant. Estimates are age adjusted.

Figure 2-3—Percent of Children with Usual Daily Sodium Intakes Greater Than UL



Differences between WIC participants and each group of nonparticipants are not statistically significant. Estimates are age adjusted.

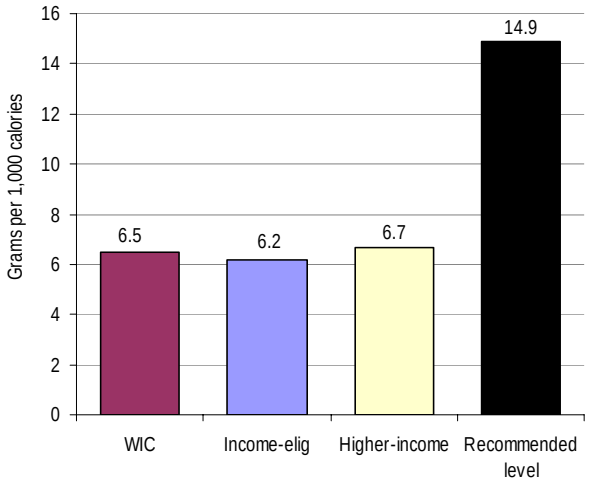
specific age-and-gender subgroups, as reported in the 1994-96, 98 Continuing Survey of Food Intakes by Individuals (CSFII) (IOM, 2005b).

Among WIC children and both groups of nonparticipant children, usual daily intakes of fiber were equivalent to about 50 percent of the AI (Table 2-1). On a gram-per-1,000 calorie basis, mean usual daily intakes were about 6, on average, for all three groups of children (Figure 2-4). There were no significant differences between WIC children and either group of nonparticipant children in either measure of usual daily fiber intakes.

Usual daily fiber intakes of all groups of children were low, relative to the AIs; even the 95th percentile of the distribution of usual fiber intake was less than the AI (Table B-36). This pattern has been reported by others (Cole and Fox, 2004; Devaney et al., 2007; and Devaney et al., 2005). Part of the discrepancy is due to the fact that the AIs are defined for *total* fiber, but food composition databases are limited to information on *dietary* fiber. However, the magnitude of this discrepancy is relatively small compared to the gap between usual intakes and the AIs.[3] For this reason, some have suggested that the methods used to establish the AIs for fiber may need to be reexamined, especially for children and adolescents (Devaney et al., 2007).[4]

[3] It is estimated that adults consume about 5.1 more grams per day of fiber than estimated from current food composition databases (IOM, 2005b). For children, the differential between estimated and true fiber consumption would be substantially less.

Figure 2-4—Mean Usual Intake of Fiber (grams per 1,000 calories)



Differences between WIC participants and each group of nonparticipants are not statistically significant. Estimates are age adjusted.

Use of Dietary Supplements

NHANES 1999-2004 collected detailed data about the use of dietary supplements from each sampled child's parent or guardian. Respondents were first asked whether the child used any dietary supplements during the past 30 days. Respondents were handed a card defining 13 types of supplements to use as a reference in answering this question. The list included single and multiple vitamin and mineral products; antacids taken as a calcium supplement; fiber taken as a dietary supplement; botanicals, herbs, and herbal medicine products; amino acids; and fish oils.[5] Respondents who reported supplement use were asked to show the actual bottles or jars to interviewers so the type of supplement(s) and associated dosage information could be recorded.

Because data on dietary intake and supplement use were collected for different reference periods (preceding 24 hours and preceding month, respectively), combining the two data sets is not straightforward. For this reason, NHANES 1999-2004 dietary intake data do not include contributions from dietary supplements.[6] Consequently, estimates of the proportions of individuals with adequate usual daily intakes may be understated. In addition, observed differences in usual daily intakes of WIC children and higher-income nonparticipating children are probably understated because the

[4] The data used to establish AIs are drawn from studies of coronary heart disease risk among adults. Moreover, the AIs for children are 2 to 3 times higher than the standard previously used to assess fiber intake in this age group (Devaney et al., 2007).

[5] NHANES Documentation: Dietary Supplement Data, 1999-2000, 2001-02, and 2003-04.

[6] Carriquiry (2003) recommends frequency questions about supplement use in the past 30 days (as currently administered by NHANES) combined with replicate 24-hour recalls to capture daily nutrient intake from supplements and allow estimation of within-person variance in supplement intakes. This approach is currently being used in collecting data for NHANES 2007-08.

prevalence of dietary supplement use is different in the two groups.

Dietary supplement information can be important in interpreting data on usual nutrient intakes presented in companion reports in this series, which focus on participants and nonparticipants in the Food Stamp Program and the school meal programs. However, information on dietary supplement use has little consequence for the data presented in this report because the prevalence of adequate usual intakes—from foods and beverages alone—was so high for WIC children and both groups of nonparticipating children. Nonetheless, it is informative to examine the use of dietary supplements in this young, well-nourished age group. The 2002 Feeding Infants and Toddlers Study (FITS), which included dietary supplements in estimates of usual nutrient intakes, found evidence of excessive intakes (usual intakes that exceeded the UL) among children 12 to 24 months of age who received dietary supplements. This was true for vitamin A (97 percent of supplement users), folate (18 percent), and zinc (68 percent) (Briefel et al., 2006).[7] Usual vitamin and mineral intakes that exceed the UL increase children's risks of adverse health effects.

Prevalence of supplement use

Data from NHANES 1999-2004 show that 39 percent of children between the ages of 1 and 4 used one or more dietary supplements during the preceding month (Table 2-2). Vitamin and mineral combinations were the most common type of supplement used. Most children (91 percent) used only one supplement. Supplement use was more

[7] The 24-hour recall protocol used in FITS collected data on dietary supplement use as well as intake of foods and beverages.

Table 2-2—Prevalence of Dietary Supplement Use in Past Month

	Children age 1-4 years			
	All Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
Sample size	2,581	1,004	761	709
Used supplements last month	39.1	29.6	35.2	***47.9
Type of supplements[1]				
None	60.7	70.2	64.8	52.1
Single vitamin	2.3	2.9	2.5	2.4
Multiple vitamin	6.7	6.0	5.6	7.8
Single mineral	3.9	3.8	3.2 u	4.1
Vitamin/ mineral combo	28.8	19.0	25.0	37.4
Other	1.5	0.9 u	1.9	1.6 u
Among those using supplements				
Number of supplements				
One	91.4	92.4 u	94.8 u	† 89.4
Two	7.1	2.9	4.6 u	9.3
Three+	1.6 u	4.6 u	0.5 u	1.3 u

Notes: For "Used supplements last month", significant differences between proportions of WIC participants and each group of nonparticipants were identified with t-tests and are noted by * (.05 level), ** (.01 level), or *** (.001 level). For "Number of supplements", significant differences in the distribution of WIC participants and each group of nonparticipants were identified with chi-square tests and are noted by †.
1 Significance test not done because categories are not mutually exclusive for persons who take multiple supplements.
u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

Source: NHANES 1999-2004 sample of children with complete dietary recalls. Survey information was reported by parent or guardian. "All Children" includes those with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

common after the first year of life, increasing from 25 percent among 1-year-olds to 42-46 percent among 2- to 4-year-olds (Table 2-3).

There were no significant differences in the proportions of WIC children and income-eligible nonparticipating children who used dietary supplements. Higher income children, however, were more likely than low-income children to use supplements (Table 2-3 and Figure 2-5). The difference in supplement use between higher income nonparticipant children and WIC children was largest for 2-year-olds, with higher-income children nearly twice as likely to use supplements (58 percent vs. 31 percent). Among 4-year-olds, the difference between groups was narrowed (48 percent vs. 39 percent), and was not statistically significant.

There was also a significant difference between WIC children and higher-income nonparticipants in the number of supplements used, with higher-income children being more likely to use more than one supplement.

Summary

Data from NHANES 1999-2004 indicate that the usual diets of U.S. children ages 1 to 4 provide adequate amounts of essential vitamins and minerals.[8] This is true for WIC children and for both income-eligible and higher-income children who did not participate in WIC.

[8] Firm conclusions cannot be drawn about the adequacy of usual potassium intakes because an EAR has not been established.

Table 2-3—Prevalence of Dietary Supplement Use in Past Month, By Year of Age

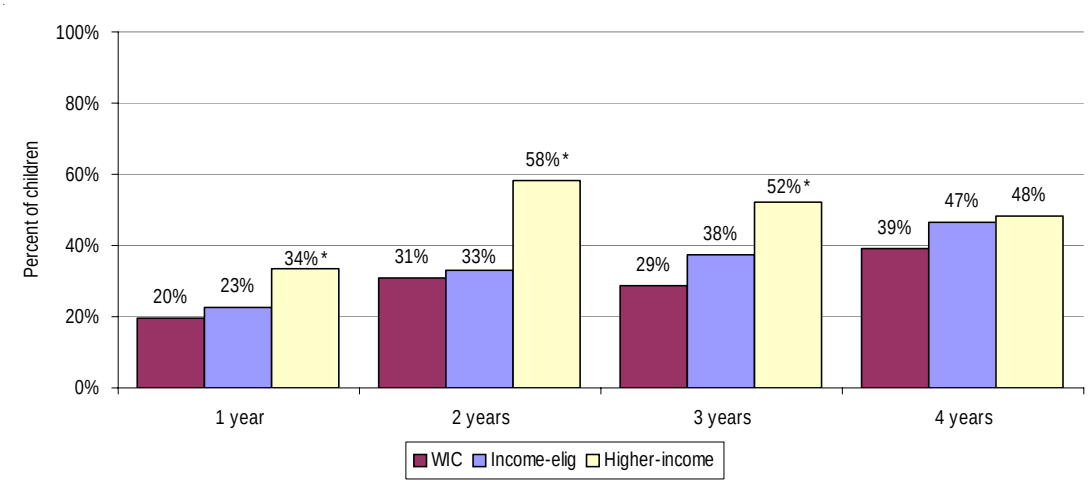
	All Children			WIC Children		
	Sample size	Percent	Standard error	Sample size	Percent	Standard error
Children						
1 years old	782	25.2	*(2.47)*	373	19.5	*(2.86)*
2 years old	783	43.2	*(3.02)*	307	30.7	*(4.27)*
3 years old	518	41.6	*(2.45)*	192	28.7	*(4.69)*
4 years old	498	46.4	*(4.03)*	132	39.1	*(5.90)*
Total, age adjusted	2,581	39.1	*(1.84)*	1,004	29.6	*(2.64)*

	Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Percent	Standard error	Sample size	Percent	Standard error
Children						
1 years old	193	22.7	*(4.88)*	191	* 33.5	*(5.40)*
2 years old	218	33.2	*(3.97)*	220	*** 58.1	*(4.59)*
3 years old	171	37.6	*(5.20)*	131	** 52.0	*(5.08)*
4 years old	179	46.7	*(5.39)*	167	48.1	*(6.68)*
Total, age adjusted	761	35.2	*(2.95)*	709	*** 47.9	*(2.67)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC at the time of the interview.

Source: NHANES 1999-2004 children with complete dietary recalls. "All Children" includes those with missing WIC participation or income.

Figure 2-5—Prevalence of Dietary Supplement Use in Past Month



* Denotes statistically significant difference from WIC participants at the .05 level or better.

One quarter of 1-year-olds and roughly 45 percent of 2- to 4-year-olds received one or more dietary supplements during the month preceding their NHANES interview. With the exception of 4-year-olds, the use of supplements was less common among low-income children (WIC participants and nonparticipants), compared with higher-income nonparticipating children.

It is not possible to estimate the contribution of dietary supplements to usual daily intakes using the NHANES data. However, data from the 2002 FITS study suggest that there may be reason to be concerned about the use of dietary supplements in a population whose usual intake of foods and beverages provides adequate amounts of vitamins and minerals. Use of dietary supplements may increase children's risk of adverse health outcomes associated with excessive nutrient intakes.

Sodium intakes are of concern for all children in the 1-4-year-old age group. Eighty-seven percent of WIC children had usual daily sodium intakes that exceeded the UL. Comparable findings were noted for both income-eligible and higher-income nonparticipating children.

Fiber intakes of all children ages 1 to 4 were low, relative to the AIs. However, the methods used to establish AIs for fiber, especially for children and adolescents, may need to be reexamined.

Chapter 3
Energy Intakes

In this chapter, we examine mean usual daily energy (calorie) intakes of WIC children and nonparticipant children. In addition, we use several different measures to gain insights into the sources of energy in children's diets. These include usual daily intakes of macronutrients (total fat, saturated fat, carbohydrate, and protein) expressed as percentages of usual energy intakes, and 24-hour intakes of discretionary calories from solid fats and added sugars.[1] We also examine the energy density (calories per gram of food) of children's diets.

We conclude the chapter by using measures of Body Mass Index (BMI)-for-age to assess the appropriateness of children's usual energy intakes. Because energy consumed in excess of requirements is stored as body fat, BMI provides a reliable indicator of the extent to which long-run (usual) energy intakes are consistent with or exceeded energy requirements.

Some of the analyses presented in this chapter exclude children 1 year of age. This is true for analyses that assess (1) usual daily intakes of energy from saturated fat, (2) 24-hour intakes of discretionary calories from solid fats and added sugars, and (3) BMI-for-age. The reason for the age limitation is that the standards used in these analyses apply only to children 2 years of age and older.

MEASURES OF ENERGY INTAKES

Measure	Data	Age
Estimates based on 24-hr intakes:		
1. Mean daily energy intakes	NHANES 1999-2004	1-4
2. Percent of energy from SoFAAS (solid fats and added sugars)	MyPyramid 1999-2002	2-4[a]
3. Energy density of daily intakes	NHANES 1999-2004	1-4
4. Percent of children by weight status (Body Mass Index),as indicator of adequacy of energy intakes	NHANES 1999-2004	2-4[b]
Estimates based on usual intakes:		
5. Percent of children with adequate intakes of energy from:		
• Total fat, protein, carbohydrates (relative to AMDRs)	NHANES 1999-2004	1-4
• Saturated fat (relative to DGA)	(same)	2-4[a]

[a] Dietary Guidelines for saturated fat and MyPyramid recommendations for SoFAAS apply to persons age 2 and above.

[b] National growth charts for BMI include children age 2 and above.

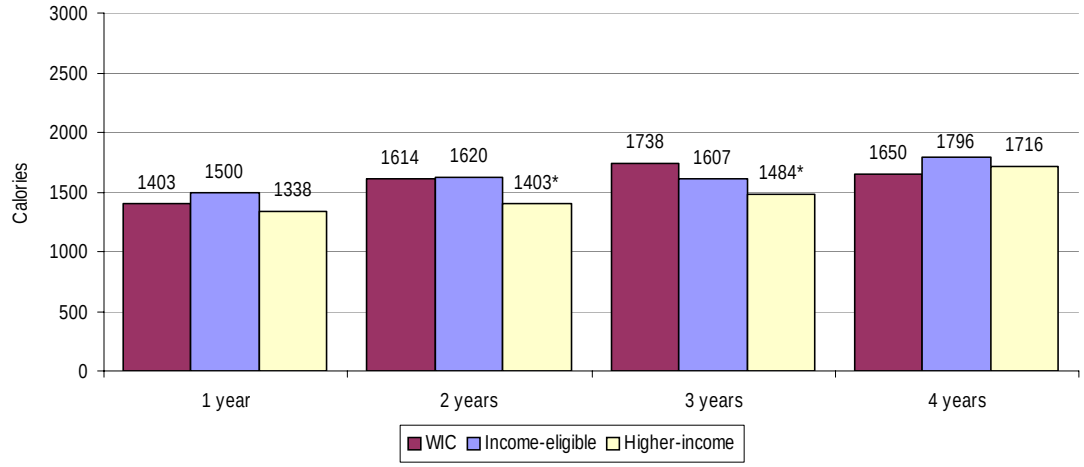
Mean Daily Energy Intakes

On average, there were no significant differences between WIC children and income-eligible nonparticipant children, by year of age, in reported daily energy intakes (Figure 3-1 and Table B-1). However, among children 2 and 3 years of age, reported energy intakes were significantly higher (about 16 percent higher) for WIC children than for higher-income nonparticipant children (1,614 calories vs. 1,403 for 2-year-olds and 1,738 calories vs. 1,484 for 3-year-olds).

Estimated daily energy requirements for children in this age group are 1,000 calories for sedentary children and 1,000 to 1,400 calories for moderately active and active children (IOM, 2005b). The reported means shown in Figure 3-1 generally exceed this range. While some children may be taking in too many calories, energy intakes of some children are likely to be overestimated due to overreporting of food intake by parents and caregivers (Devaney et al., 2004). Mean energy intakes are not presented by activity level, because activity levels are not adequately measured by most surveys, including NHANES (prior to 2003). Because of the difficulties associated with estimating energy requirements, the IOM recommends that measures of BMI be used to assess the adequacy of energy intakes (IOM, 2005b). Data on BMI-for-age are presented later in this chapter.

[1] It was not possible to estimate usual intake distributions for discretionary calories because the MyPyramid Database includes data for single 24-hour recalls for each NHANES respondent. Thus we present estimates of mean intake and do not present distributional estimates (e.g., the percent of children above or below some cutoff).

Figure 3-1—Mean Daily Energy Intakes



* Denotes statistically significant difference from WIC participants at the .05 level or better.

Usual Daily Intakes of Energy from Macronutrients

To gain insights into the sources of energy in children's diets, we measured macronutrient intakes as percentages of total energy intake and compared them to accepted standards. Usual daily intakes of total fat, protein, and carbohydrate were compared to Acceptable Macronutrient Distribution Ranges (AMDRs) defined in the DRIs (IOM, 2006). Usual daily intakes of saturated fat were compared to the 2005 *Dietary Guidelines for Americans* (DGA) recommendation (USDHHS/ USDA, 2005).[2]

AMDRs define a range of usual daily intakes that is associated with reduced risk of chronic disease while providing adequate intakes of essential nutrients (IOM, 2006). If an individual's usual daily intake is above or below the AMDR, risks of chronic disease and/or insufficient intake of essential nutrients are increased. The AMDR ranges are shown in Appendix A, Table A-1. In the case of saturated fat, usual daily intakes that exceed the DGA recommendation (less than 10 percent of total energy) increase the risk of cardiovascular disease.

Overall, usual daily fat intakes of the majority (68-72 percent) of children were consistent with the AMDR (Table 3-1). In addition, there were no significant differences in the proportions of WIC children and nonparticipant children with usual daily intakes of fat that exceeded or fell below the AMDR. In all three groups, the proportion of children with usual intakes of fat below the AMDR (17 to 27 percent) was higher than the proportion with usual intakes exceeding the AMDR (6 to 11 percent).

When data were examined by year of age, the above patterns were observed for children 1 to 3 years of age. However, 4-year-old children had reverse patterns with usual intakes of total fat more often falling above the AMDR than below it (Figure 3-2). This pattern for 4-year-olds was observed for WIC children and for both groups of nonparticipant children (Table B-40) and reflects the change in AMDR from 30-40 percent of energy for 1-3-year-olds, to 25-35 percent of energy for 4-year-olds. Mean intake of total fat as a percent of energy is fairly consistent across ages (31-33 percent) (Table B-40).

Mean usual daily intakes of energy from protein and carbohydrates, relative to AMDRs, were comparable for WIC children and both groups of nonparticipant children (Table 3-1). In all cases, more than 90 percent of children had usual intakes of energy from protein and carbohydrates that were consistent with the AMDRs.

Overall, only 14 percent of children ages 2 to 4 had usual daily intakes of saturated fat that met the DGA standard (less than 10 percent of total energy)

[2] The DRIs do not include quantitative standards for saturated fat.

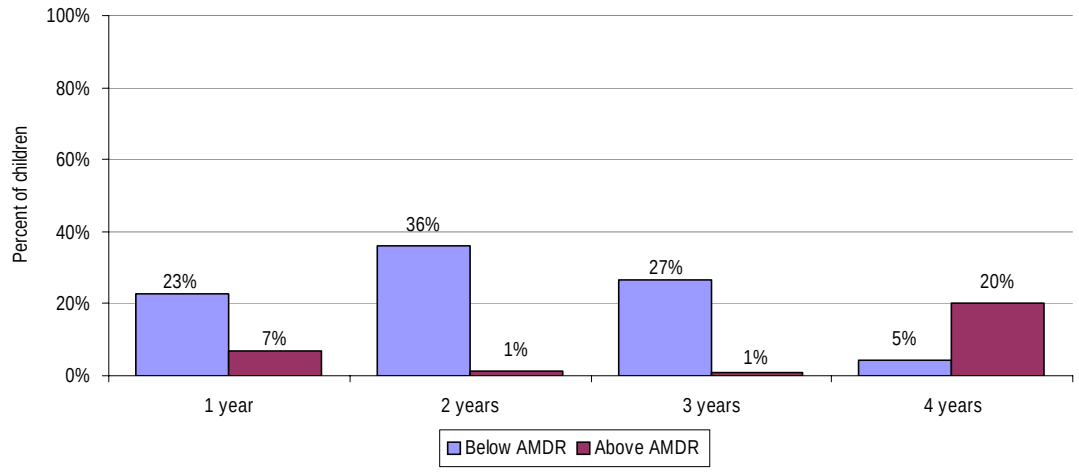
Table 3-1—Usual Daily Intakes of Macronutrients Compared to Standards

	Children age 1-4 years			
	All Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of Persons			
Total fat				
% < AMDR	22.3	21.2	17.0	26.7
% within AMDR	70.3	69.9	72.2	67.6
% > AMDR	7.4	8.9 u	10.8	5.8
Protein				
% < AMDR	0.6 u	0.2 u	0.5 u	1.2 u
% within AMDR	98.7	99.2 u	98.4 u	98.2 u
% > AMDR	0.6 u	0.6 u	1.1 u	0.5 u
Carbohydrate				
% < AMDR	2.8	2.2 u	4.4 u	3.0 u
% within AMDR	94.7	96.1	94.0	93.4
% > AMDR	2.4	1.6 u	1.6 u	3.6 u
Saturated fat, % < DGA	14.3	11.1 u	12.6	18.3

Notes: Differences between WIC participants and each group of nonparticipants are not statistically significant.
See Appendix B for standard errors of estimates and percentile distributions.
u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

Source: NHANES 1999-2004 dietary recalls. "All Children" includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.* Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Figure 3-2—Percent of All Children with Usual Daily Intakes of Total Fat Below and Above the AMDR



(Table B-42).3 Estimates for WIC children, overall or by year of age, were comparable to income-eligible nonparticipant children and lower than higher-income children (Figure 3-3). However, differences between WIC children and higher-income children were not statistically significant.

24-Hour Intakes of Energy from Solid Fats and Added Sugars

The DGAs and the MyPyramid food guidance system provide dietary intake recommendations for individuals 2 years and older. These recommendations include specific allowances for discretionary calories—defined as calories that can be used flexibly after nutrient requirements are met (Britten, 2006).[4] Discretionary calorie allowances are defined based on estimated energy needs and calories in the most nutrient dense form (fat-free or lowest fat form, with no added sugars) of the various foods needed to meet recommended nutrient intakes (Basiotis et al., 2006). For children 2 to 3 years of age, the discretionary calorie allowance is 165 calories per day (17 percent of daily calorie needs); for children age 4, the discretionary calorie allowance is 170 calories per day (13 percent of daily calorie needs).[5]

A method for assessing discretionary energy intake was introduced by USDA's Center for Nutrition Policy and Promotion (CNPP) (Basiotis et al., 2006). CNPP measured discretionary calories from solid fats, alcoholic beverages, and added sugars (SoFAAS) using data from the NHANES Individual Food Files (IFF) and *MyPyramid Equivalents Database* (Friday and Bowman, 2006). The NHANES IFF contains one record for each food reported in the single 24-hour recall completed by all respondents, with measures of food components including grams of alcohol. The MyPyramid database contains records corresponding to each NHANES IFF record, with measures of the grams of discretionary solid fats and teaspoons of added sugars.

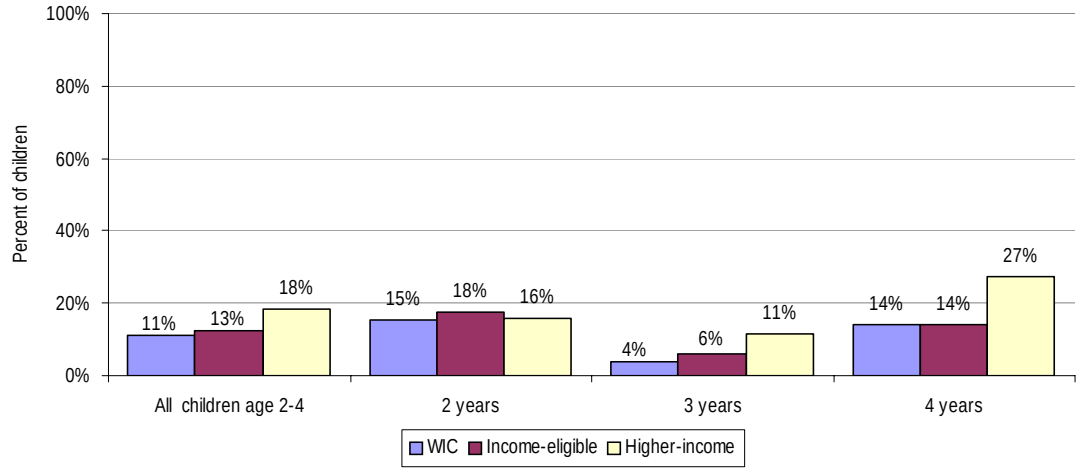
Following CNPP's approach, we used NHANES and MyPyramid data to calculate the calories from SoFAAS for each food reported for children age 2

[3] Table B-42 shows that the mean usual intake of saturated fat is approximately the same (12 percent of energy) for all age and participant groups, while the percent of children meeting dietary guidelines varies across age groups due to differences in the underlying distributions of intake (Table B-43).

[4] Individuals may satisfy nutrient requirements with the fewest calories by eating nutrient dense foods. Calories remaining in their estimated energy requirement are discretionary.

[5] www.MyPyramid.gov/pyramid/discretionary_calories_amount.html.

Figure 3-3—Percent of Children Age 2-4 with Usual Daily Intakes of Saturated Fat Meeting Dietary Guidelines Recommendation



Notes: Differences between WIC participants and each group of nonparticipants are not statistically significant. Estimates for "All children age 2-4" are age adjusted. The Dietary Guidelines recommend that persons age 2 and above consume less than 10 percent of total daily calories from saturated fat.

to 4-years-old (alcohol consumption was zero for all children in this age group). This analysis differs from the analyses in the two previous sections in three important ways (see box on page 17): (1) the analysis is limited to 1999-2002 because MyPyramid data for 2003-04 were not available when the study was conducted; (2) the analysis is based on a single 24-hour recall rather than usual daily intakes because the data needed to estimate usual daily intakes of discretionary fat and added sugars are not available—MyPyramid data are not available for 2003-04, when NHANES began collecting two 24-hour recalls; and (3) the sample is limited to children age 2-4 because MyPyramid dietary guidance does not apply to children under 2 years of age.

Appendix A provides details on how estimates of calories from SoFAAS were derived. This measure should be viewed as lower-bound estimate of discretionary energy intake because discretionary calories may also come from additional amounts of the nutrient-dense foods recommended in the *MyPyramid* food intake patterns (Basiotis et al., 2006).

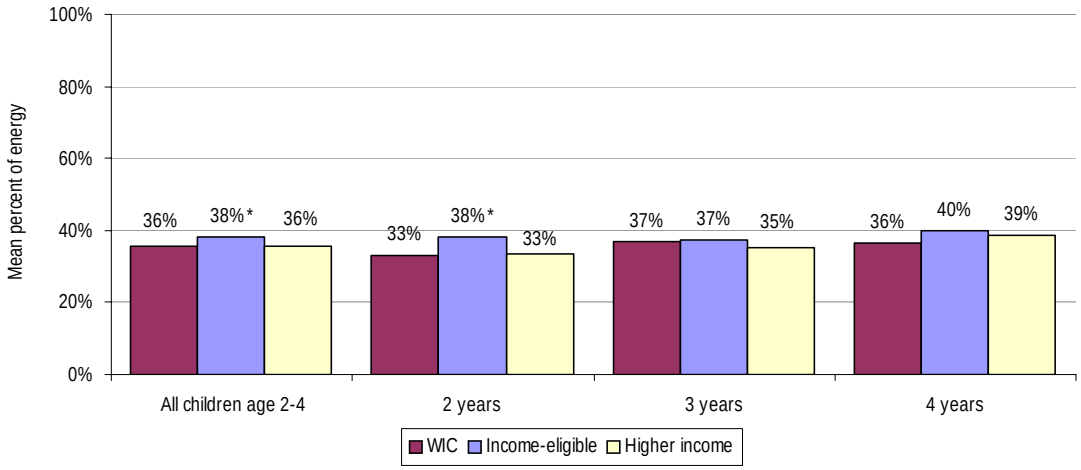
On average, children ages 2 to 4 obtained 36 percent of their 24-hour energy intakes from SoFAAS (Table C-1). This is more than twice the amount of discretionary calories recommended in the MyPyramid food guidance system. The number of calories consumed from SoFAAS was at or below discretionary calorie allowances for fewer than 3 percent of children age 2-4 years old (data not shown).

WIC children and higher-income nonparticipant children obtained comparable proportions of their 24-hour energy intakes from SoFAAS (Figure 3-4). However, WIC children obtained a significantly smaller proportion of energy from SoFAAS than income-eligible nonparticipant children (36 percent vs. 38 percent). This difference was attributable to a difference in the percentage of energy from SoFAAS in the snacks consumed by the two groups of children (discussed in Chapter 4). The difference between WIC children and income-eligible children was largely due to a difference among 2-year-olds (33 vs. 38 percent, or a difference of 90 SoFAAS calories) (Table C-1 and Figure 3-4).

Energy Density

The DGA stresses the importance of consuming foods so that individuals stay within their energy needs. In developing the 2005 edition of the DGA, the Dietary Guidelines Advisory Committee concluded that, while the available scientific data were insufficient to determine the contribution of energy dense foods to unhealthy weight gain and obesity, there was suggestive evidence that consuming energy dense meals may contribute to excessive caloric intake and that, conversely, eating foods of low energy density may be a helpful

Figure 3-4—Percent of Energy from Solid Fats and Added Sugars (SoFAAS)[a]



[a] SoFAAS is the acronym for solid fats, alcoholic beverages, and added sugars. Alcohol consumption was zero for this age group.
* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates for "All children age 2-4" are age adjusted.

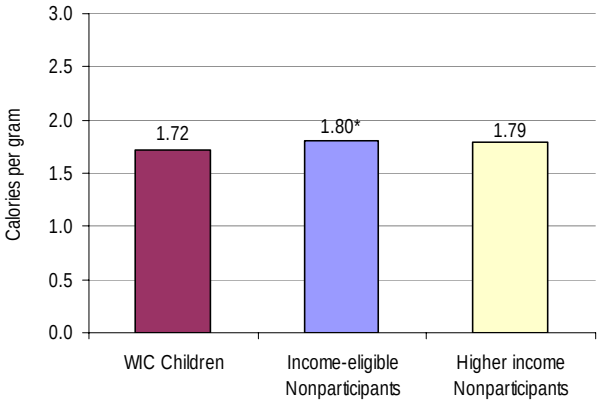
strategy to reduce energy intake when trying to maintain or lose weight (USDHHS/USDA, 2005).

The energy density of a food is equivalent to the available food energy per unit weight (e.g., calories per gram). The energy density of individual foods depends on the composition of the food: the relative concentration of energy-providing nutrients (fat, carbohydrate, protein), alcohol (which provides almost as many calories per gram as fat), and water. Water content may be the single most influential characteristic in determining energy density (Drewnowski, 2005). Whole grains and cereal, which have low water content, are energy dense, while fruits, vegetables, and milk, which have high water content, are energy dilute. Beverages, which are mostly water, may have comparable energy densities despite important differences in nutrient content. For example, orange juice, 1% milk, and regular cola all provide roughly 0.43 calories per gram (Drewnowski and Specter, 2004).

Assessing the energy density of combinations of foods (the total diet) is not straightforward. There is no scientific consensus about which of several potential approaches should be used. We estimated energy density using a method that considers only foods—solid items and liquid items that are typically consumed as foods, such as soups and ice cream—and excludes all beverages.[6]

Overall, there were no significant differences in the mean energy density of foods consumed by WIC children and higher-income nonparticipant children. WIC children, however, consumed foods that were lower in energy density compared with income-eligible nonparticipant children (1.72 calories per gram vs. 1.80 calories per gram) (Figure 3-5). Data broken down by year of age revealed that the difference between WIC children and income-eligible nonparticipant children was concentrated among 1-year-olds (1.58 calories per gram vs. 1.71) (Table C-2).

Figure 3-5—Mean Energy Density of Foods



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Body Mass Index as an Indicator of the Appropriateness of Usual Daily Energy Intakes

The overarching question in any analysis of energy intakes is whether energy intakes exceed requirements. The IOM recommends that Body Mass Index (BMI) be used to assess the appropriateness of usual energy intakes. BMI is a measure of the relationship between weight and height and is the commonly accepted index for classifying adiposity (fatness) (Kuczmarski and Flegal, 2000).[7] Because energy consumed in excess of requirements is stored as body fat, BMI provides a reliable indicator of the extent to which long-run (usual) energy intakes are consistent with or exceeded energy requirements (IOM, 2005b).[8]

Children age 2 and older can be assigned to one of four BMI-for-age categories based on guidelines from the Centers for Disease Control and Prevention (CDC) (Kuczmarski et al., 2000) (Table 3-2).

[6] Ledikwe et al. (2005) compared eight approaches to estimating the energy density of the total diet: one approach included only foods, and seven included foods and various combinations of beverages. They concluded that inclusion of all beverages may result in meaningless measures of energy density if drinking water is not included because persons vary with respect to their source of liquids and energy density will be overstated for persons consuming (unmeasured) drinking water. Dietary surveys (including NHANES 1999-2002) generally do not collect information on water intake.

[7] BMI = Weight (kg) ÷ Height $(m)^2$.

[8] BMI is recommended for assessing usual energy intakes because (1) energy intakes are often misreported, (2) an individual's estimated energy requirement (EER) is strongly influenced by physical activity, which is not measured precisely in most surveys (including NHANES), and (3) the EER is an estimate of energy requirement but actual energy requirements vary among individuals (IOM, 2005b).

Table 3-2—Children's Weight Categories Based on BMI-for-Age

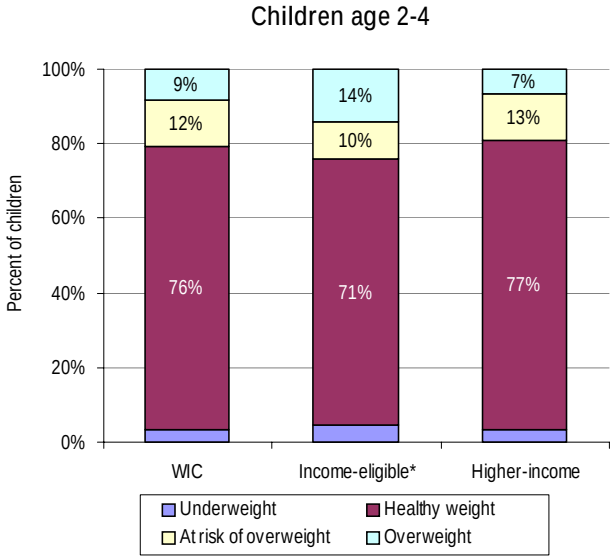
Weight category	Relative to percentiles of the CDC BMI-for-age growth chart
Underweight	Less than 5th percentile
Healthy weight	At or above 5th and less than 85th
At risk of overweight	At or above 85th and less than 95th
Overweight	At or above 95th percentile

A BMI-for-age in the healthy range indicates that usual daily energy intake is consistent with requirements; a BMI-for-age below the healthy range indicates inadequate usual daily energy intake; and a BMI-for-age above the healthy range indicates that usual daily energy intake exceeds requirements.

Only four percent of children were considered underweight based on BMI-for-age (Table C-3). The majority of children (75 percent overall) were at a healthy weight. About two in ten children (21 percent) had a BMI-for-age above the healthy range, with one in ten children classified as overweight (Table C-3).[9]

There was no statistically significant difference between WIC children and higher-income nonparticipant children in the distributions of BMI-for-age (Figure 3-6). However, distributions differed for WIC children and income-eligible nonparticipant children, due to a statistically significant difference in the percent overweight—9 percent of WIC children vs. 14 percent of income-eligible nonparticipant children. Analysis of data by age group showed that this difference was concentrated among 4-year-olds, where income-eligible nonparticipants were twice as likely as WIC children to be overweight (20 percent vs. 10 percent) (Table C-3).[10]

Figure 3-6—Percent of Children By Weight Category



* Denotes statistically significant difference from WIC participants at the .05 level or better based on chi-square tests of the distributions of weight status. Percents are age adjusted.

Earlier in this chapter, we reported that WIC children in two age groups (2- and 3-year-olds) had significantly higher mean energy intakes than higher-income nonparticipant children (Figure 3-1). Analyses of BMI-for-age, however, indicates that WIC children's higher energy intakes do not result in higher prevalence of overweight. Two possible explanations are: (a) WIC participant children are more active than nonparticipant children, or (b) parents and caregivers of WIC participants may be more likely than parents and caregivers of higher-income children to overreport their children's intakes.

The fact that there were no significant differences in reported mean energy intakes of WIC participants and income-eligible nonparticipants suggests that a tendency toward overreporting intakes may apply to low-income parents and caregivers in general. This is consistent with findings of the 2002 Feeding Infants and Toddlers Study, which found that parents and caregivers of infants and toddlers may overreport their children's intakes (Devaney et al., 2004). Potential explanations include difficulties associated with reporting small amounts of food, differentiating between what was served and what

[9] Current CDC guidelines use the terms "at risk of overweight" and "overweight" to categorize children with BMIs-for-age that are outside the healthy range. The Expert Committee on the Assessment, Prevention and Treatment of Child and Adolescent Overweight and Obesity (2007) has recommended that the CDC terms be abandoned in favor of the terms used for adults—overweight and obese, respectively, and some expert groups have been using these terms for some time (IOM, 2005b).

[10] T-statistics were examined for the difference in percent overweight.

was actually consumed, and using visual aids to report portion sizes. There may also be a desire, on the part of parents and caregivers, to portray their children as hearty eaters or being well fed.

If energy intakes of children were overreported, then nutrient intakes were also overreported. This means that the prevalence of adequate nutrient intakes, as reported in the preceding chapter, may be overestimated, particularly for low-income children. While this possibility must be acknowledged, detailed distributions of usual nutrient intakes (available in Appendix B) suggest that overreporting had relatively little impact on overall findings about nutrient adequacy. For most nutrients, usual intakes of WIC children and both groups of nonparticipant children exceeded the relevant EAR at the 5th percentile of the distribution.

Summary

Data from NHANES 1999-2004 show that distributions of BMI-for-age for children ages 2 to 4 were comparable for WIC children and higher-income nonparticipant children, while WIC children were less likely than income-eligible nonparticipant children to be overweight (9 percent vs. 14 percent). However, roughly 20 percent of children in all three groups were overweight or at risk for overweight, indicating that some children in all groups are consuming more calories than they need on a regular basis. The data indicate that this problem is most severe among 4-year-old income-eligible nonparticipant children, where the prevalence of overweight was 20 percent, and 31 percent were overweight or at risk for overweight.

Children's intakes of energy from fat, carbohydrate, and protein were generally within acceptable ranges. However, the DRIs recommend a decrease in intake of total fat as children age, with the AMDRs changing from 30-40 percent of energy for 1-3-year-olds, to 25-35 percent of calories for 4-year-olds. Mean intake of total fat as a percent of energy was fairly consistent across ages. The proportion of children age 1-3 with intakes of fat below the AMDR was higher than the proportion with intakes above the AMDR; that trend reverses at age 4.

Although usual intakes of macronutrients were largely within acceptable ranges, WIC children and both groups of nonparticipant children obtained too many calories from saturated fat and consumed too many calories from solid fats and added sugars. Overall, only 14 percent of children ages 2 to 4 had usual daily intakes of saturated fat that met the DGA standard. Moreover, children obtained an average of 36 percent of their 24-hour energy intakes from SoFAAS—more than twice the amount of discretionary calories recommended in the MyPyramid food guidance system. WIC children obtained a significantly smaller proportion of energy from SoFAAS than income-eligible nonparticipant children (36 percent vs. 38 percent).

These results suggest that an important focal point for WIC nutrition education efforts is children's intakes of saturated/solid fats and added sugars. Decreased intakes of foods that are major contributors of these dietary constituents would improve the overall healthfulness of children's diets. Because children's taste preferences and habits develop over time, it is important to work with caregivers and parents to establish and maintain healthful eating habits from very young ages. Chapters 4, 5, and 6 provide information about sources of saturated/solid fats and added sugars that may be useful in targeting WIC nutrition education efforts.

Chapter 4
Meal and Snack Patterns

In this chapter, we examine meal and snack patterns of WIC children and nonparticipant children. We look first at the proportion of children who consumed specific meals, and the average number of snacks consumed per day. We then assess the quality of the meals and snacks consumed by WIC children and nonparticipant children using three measures listed in the box to the right. Energy density and the percentage of energy contributed by SoFAAS were described in Chapter 3. Nutrient density assesses nutrient content relative to energy content, or the amount of nutrients received per calorie consumed. All of the analyses presented in this chapter are based on the single 24-hour recall completed by NHANES respondents and represent average dietary behaviors for each group of children.[1]

MEAL AND SNACK PATTERNS

Data

- NHANES 1999-2004: Single 24-hour recall per person

Measures

- Number of meals and snacks eaten
- Nutritional quality of each meal and all snacks
  a) Energy density
  b) Percentage of energy from SoFAAS (solid fats and added sugars)
  c) Nutrient density

Meals Eaten

Parents and caregivers who provided dietary recall data for young children were asked to report, for every food and beverage a child consumed, the eating occasion (breakfast, lunch, dinner, or snack) and the time of day at which the food or beverage was consumed. We used these data to determine the proportions of children who ate each type of meal, the proportion who ate three meals, and the total number of snacks eaten. Classifications of eating occasions are self-reported and thus reflect parent and caregivers perceptions about what constituted a meal vs. a snack. The NHANES documentation reports that information about meals was "cleaned" for consistency with respect to meals reported at unusual times. The data contain 16 meal codes corresponding to English and Spanish meal names, and we recoded these as breakfast, lunch, dinner, and snacks, as described in Appendix A.[2]

Eighty-four percent of children ages 1 to 4 consumed three meals on the day that 24-hour recall data were collected (Table C-4). Overall, there was no difference between WIC children and income-eligible nonparticipant children in the percentage who consumed three meals. However, WIC children were significantly less likely than higher-income nonparticipant children to consume three meals (80 percent vs. 88 percent). This difference was concentrated among the youngest children (1- and 2-year-old) (Figure 4-1 and Table C-4). Among 2-year-olds, WIC children were less likely than either group of nonparticipant children to consume three meals (75 percent vs. 89 percent and 92 percent).

Data on individual meals indicate that 1- and 2-year old WIC children were less likely to consume lunch and dinner meals, compared with nonparticipants (Table C-5). Only one significant difference was noted for the consumption of breakfasts and it was in the opposite direction of the other findings (3-year-old WIC children were more likely than comparably aged income-eligible nonparticipants to consume breakfast).

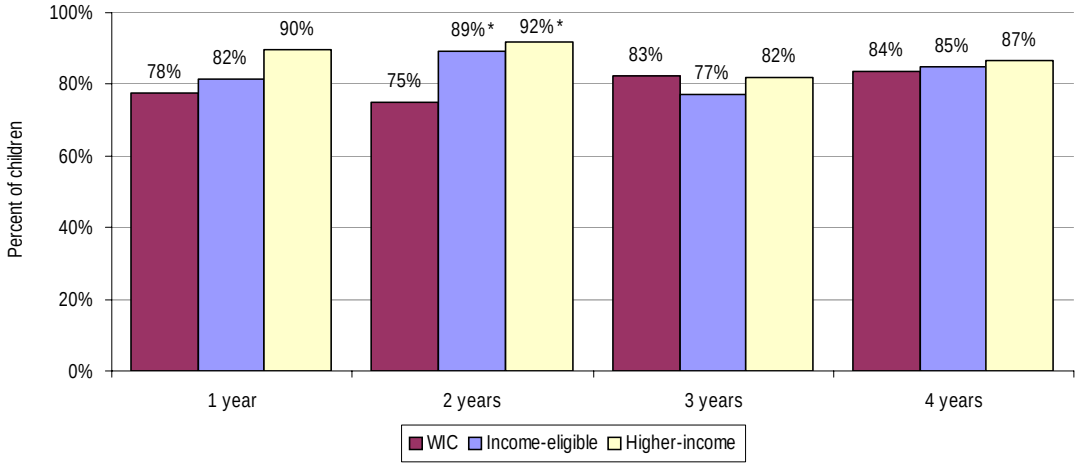
Snacks Eaten

WIC children and nonparticipant children had comparable snacking patterns. All three groups consumed about three snacks per day (Table C-6).

[1] This chapter does not present estimates of "usual intake," as was done in Chapter 2 because the focus is on mean intakes, not the percentage of the population above or below a cutoff. Usual intakes are needed to obtain correct estimates of the population distribution, but are not needed to obtain valid estimates of mean intakes.

[2] We recoded NHANES meal codes to breakfast, lunch, and dinner to capture the prevalence of the three main meals. For snacks, we counted the number of distinct snack times, rather than the number of foods reported as snacks.

Figure 4-1—Percent of Children Reported to Eat All Three Main Meals (Breakfast, Lunch, and Dinner)



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates for 'All ages' are age adjusted.

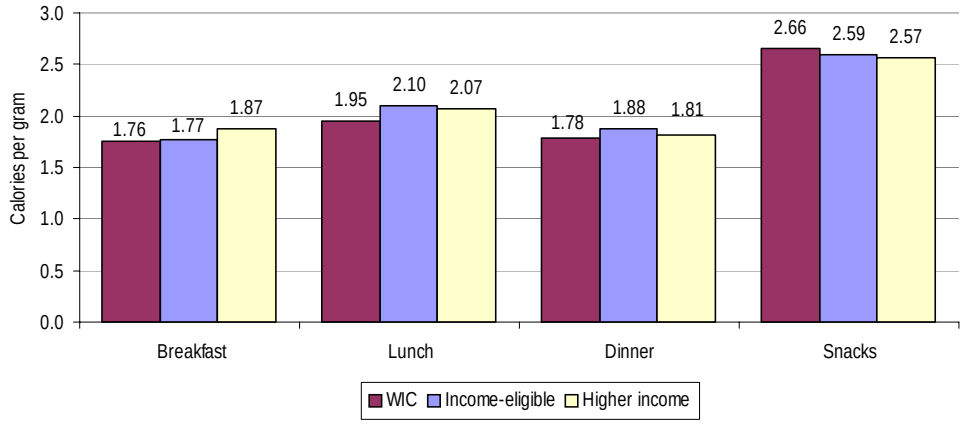
Energy Density of Meals and Snacks

Mean energy density was consistently highest for snacks than for meals (Figure 4-2), indicating that the mix of foods consumed as snacks provided a higher concentration of energy per gram than foods consumed for meals.[3]

Overall, there were no significant differences between WIC children and either group of nonparticipants in the energy density of meals and snacks (Table C-7). However, several differences were noted for individual age groups. Among 2- and 4-year-olds, the dinners consumed by WIC children were less energy dense than the dinners consumed by income-eligible nonparticipant children (1.70 to 1.75 calories per gram vs. 1.92 to 2.00). Among 3-year-olds, the breakfasts consumed by WIC participants were less energy dense than the breakfasts consumed by higher-income nonparticipants (1.61 calories per gram vs. 1.93).

[3] See Chapter 3 for a description of the energy density measure used in this analysis.

Figure 4-2—Energy Density of Meals and Snacks



Differences between WIC participants and each group of nonparticipants are not statistically significant. Estimates are age adjusted.

Energy from Solid Fats and Added Sugars in Meals and Snacks

In Chapter 3 we found that, among children age 2 to 4 years, WIC participants obtained a significantly smaller share of their 24-hour energy intakes from solid fats and added sugars (SoFAAS) than income-eligible nonparticipants. Analysis of data for individual meals and snacks indicates that this difference is due to a difference in the snacks consumed by the two groups of children. On average, 40 percent of the energy in snacks consumed by WIC children came from SoFAAS, compared with 47 percent in the snacks consumed by income-eligible nonparticipant children (Figure 4-3). This difference was concentrated among 2- and 3-year-olds (Table C-8).

Two significant differences were observed for individual age groups. Three-year-old WIC participants obtained a significantly larger share of breakfast calories from SoFAAS than 3-year-old higher-income nonparticipants (38 vs. 32 percent) (Table C-9), even though breakfasts consumed by 3-year-old WIC participants had lower energy density (1.61 calories per gram vs. 1.93). Two-year-old WIC participants obtained a smaller share of dinner calories from SoFAAS than 2-year-old income-eligible nonparticipants (27 vs. 32 percent), consistent with the energy density findings for dinners consumed by these groups.

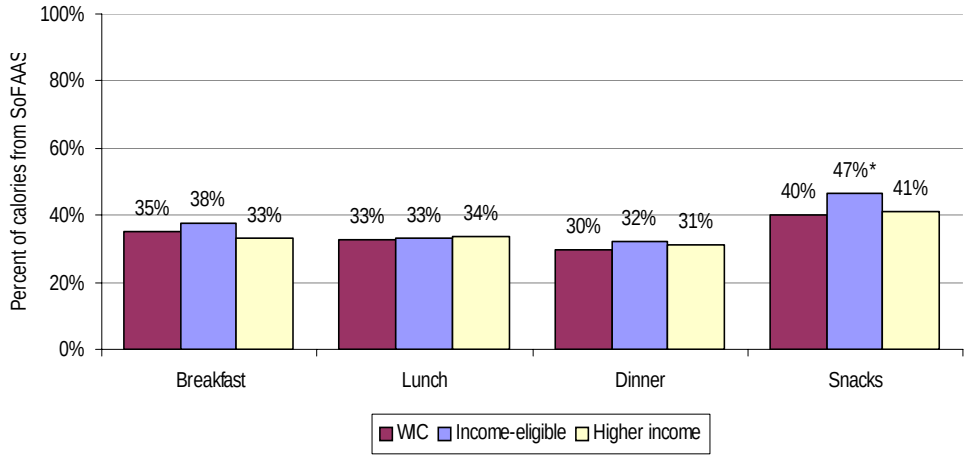
Nutrient Density of Meals and Snacks

We assessed the nutritional quality of individual meals and snacks and of all meals and snacks combined, using a measure of nutrient density. Nutrient density is a ratio that measures the nutrient contribution of a food relative to its energy contribution. This concept has been around for more than 30 years, and has recently received renewed attention because the *Dietary Guidelines for Americans* and *MyPyramid* recommendations emphasize the need for individuals to choose "nutrient-dense" foods to meet nutrient requirements without exceeding energy requirements.

There is a pressing need to develop a standard definition of nutrient density that can be understood by individuals and used by researchers. Among the several existing approaches, the Naturally-Nutrient-Rich score is viewed by some to hold the most promise (Drewnowski, 2005; Zelman and Kennedy, 2005). The NNR is a nutrients-to-calories ratio that considers nutrients commonly included in efforts to define healthy diets (Drewnowski, 2005). The NNR, as initially conceived, excludes fortified foods.

For our analysis, we used a modified NNR—the NR (Nutrient-Rich) score—that is not limited to naturally occurring nutrients. We include fortified foods in the analysis because these foods make important contributions to nutrient intakes (Subar et

Figure 4-3—Percent of Energy from Solid Fats and Added Sugars (SoFAAS)[a]



[a] SoFAAS is the acronym for solid fats, alcoholic beverages, and added sugara. Alcohol consumption was zero for this age group.
* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

al., 1998a and 1998b). The NR scores presented in this report consider the 16 nutrients shown in Table 4-1.[4]

The NR score for a food is constructed as the weighted average of the contributions of 16 nutrients, with nutrient contributions measured as a percent of daily value (DV) contributed per 2000 kcal of the food (DVs are shown in Table 4-1; derivation of the NR score is described in Appendix A). The NR score for a meal or the full complement of meals and snacks is similarly constructed, after aggregating the nutrient contributions of all foods consumed.

The NR score provides a method of assessing multiple key nutrients simultaneously. However, mean NR scores must be interpreted with caution. Higher NR scores indicate a higher concentration of nutrients per calorie but, because the score is normalized to 2,000 kcal, it does not provide an absolute measure of nutrient intake relative to DVs. Furthermore, NR scores do not account negatively for excessive concentrations of nutrients such as saturated fat, cholesterol, and sodium, which should be consumed in moderation. Finally, NR scores weight all nutrients equally. Thus, a person consuming 2000% DV of one nutrient will have a higher NR score, based on that single nutrient, than a person consuming exactly 100% DV of all nutrients.

Table 4-1—Nutrients and Recommended Daily Values (DVs) Used to Calculate Nutrient Rich Scores[a]

Nutrient	Value	Nutrient	Value
Calcium	1300 mg	Vitamin B_{12}	2.4 μg
Folate	400 μg	Vitamin C	90 mg
Iron	18 mg	Vitamin E	15 mg
Magnesium	420 mg	Zinc	11 mg
Potassium	4.7 g	Dietary Fiber	38 g
Riboflavin	1.3 mg	Linoleic acid	17 g
Thiamin	1.2 mg	α-Linolenic acid	1. 6 g
Vitamin A (RAE)	900 mg	Protein	56 g

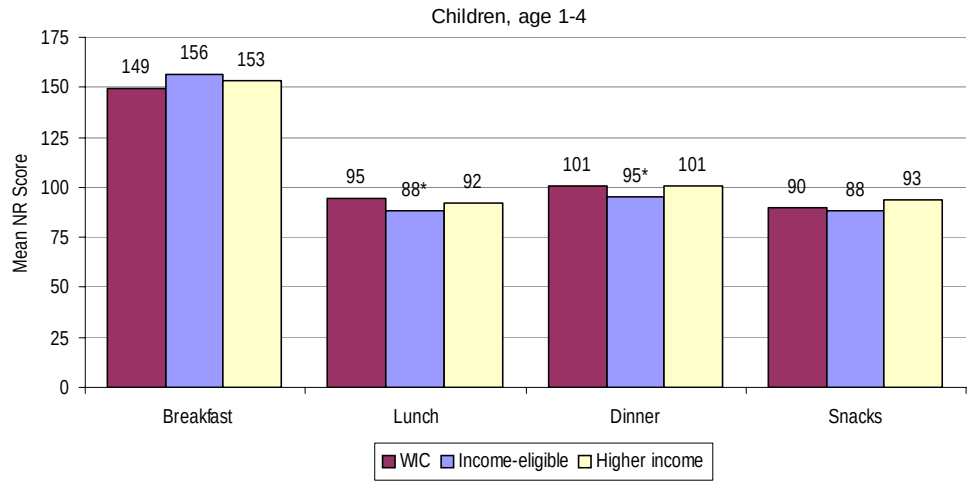
[a] Daily values are the maximum RDA or AI specified for an age group, excluding pregnant and lactating women.

Nutrient-Rich scores for individual meals and for snacks

Mean NR scores were consistently higher for breakfasts (149 to 156; Figure 4-4 and Table C-9) and lower for lunches, dinners, or snacks (88 to 101). This indicates that the mix of foods children consumed for breakfast provided a higher concen-

[4] The nutrients are the same as those used by Drewnowski, with the following exceptions. Vitamin D was not included because it was not available in the NHANES data. Additional nutrients available in NHANES (magnesium, dietary fiber, and the essential fatty acids linoleic acid and alpha-linolenic acid) were added.

Figure 4-4—Nutrient Rich (NR) Scores for Meals and Snacks



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

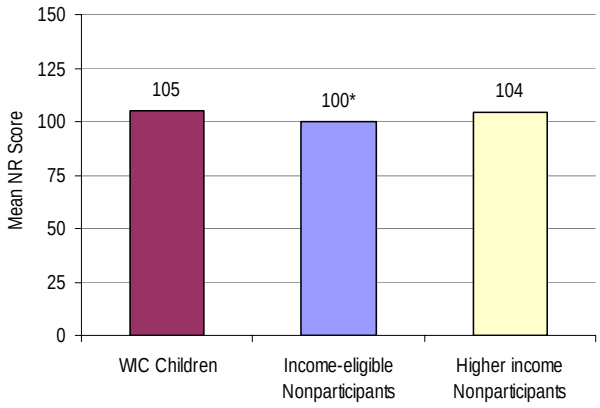
tration of nutrients per calorie than the mix of foods consumed for other meals or for snacks.

There were no significant differences between WIC children and higher-income nonparticipant children in mean NR scores for individual meals or for snacks. In comparison with income-eligible nonparticipant children, however, WIC children had significantly higher mean NR scores for lunch (95 vs. 88) and dinner (101 vs. 95). This indicates that, on a calorie-per-calorie basis, the lunches and dinners consumed by WIC children provided more nutrients than the lunches and dinners consumed by income-eligible nonparticipant children. Analysis of data by year of age indicated that the difference in lunch NR scores was concentrated among 2- and 4-year-olds (Table C-9).

Nutrient-rich scores for all meals and snacks combined

Mean NR scores for total 24-hour intakes were comparable for WIC children and higher-income nonparticipant children, overall and for each year of age (Figure 4-5 and Table C-10). Mean NR scores for WIC children were significantly higher than mean scores for income-eligible nonparticipants (105 vs. 100). This difference was most pronounced among 1-year-olds (112 vs. 105) (Table C-10).

Figure 4-5—Mean Nutrient Rich (NR) Scores for Daily Intakes



* Denotes statistically significant difference from WIC children at the .05 level or better. Estimates are age adjusted.

Summary

The majority (84 percent) of children ages 1-4 reportedly consumed three meals on the day of the 24-hour recall. On average, children in this age group consumed three snacks. Overall, there were no significant differences between WIC children and income-eligible nonparticipant children in the number of meals and snacks consumed. However, among 2-year-old children, WIC participants were significantly less likely than income-eligible nonparticipants to consume three meals (75 percent vs. 89 percent).

In comparison with higher-income nonparticipant children, WIC children were less likely to consume three meals (80 percent vs. 88 percent). This difference was concentrated among 1- and 2-year-old children and was attributable to differences in the percentage of children who consumed lunch and dinner meals.

Among 2- and 3-year-old children, snacks consumed by WIC participants provided fewer calories from SoFAAS than the snacks consumed by income-eligible nonparticipant children. This positive difference in the nutritional quality of snacks was not observed among 4-year-old children. Overall, WIC participants' diets were higher in nutrient density (as demonstrated by a significantly higher mean NR score) than the diets of income-eligible nonparticipants (105 vs. 100). This difference was largely attributable to differences in the nutrient density of foods consumed at lunch and dinner.

Chapter 5
Food Choices

In this chapter, we examine the food choices of WIC participant children and nonparticipating children. This information provides context for the findings of previous chapters, and for efforts to influence WIC participants' food choices and improve their overall diets.

We used three different approaches to examine food choices. First, we examined consumption of WIC-approved foods by WIC participants and nonparticipants. Current WIC food packages provide supplemental foods in five categories: milk (or cheese), eggs, cereal, juice, and peanut butter or beans. Within these categories, we identified WIC-approved foods according to regulatory requirements, and compared the proportions of WIC children and nonparticipant children consuming WIC-approved foods.

Second, we used a "supermarket aisle" approach to examine all food choices at the level of major food groups (fruits, vegetables, milk products, meat, etc.), and subgroups within the major groups (whole milk, 2% milk, cheese, and yogurt in the milk group). This analysis provides a comprehensive picture of the food choices of WIC children and nonparticipant children—including foods not provided by the WIC program—and differences across groups. Some differences in food choice may have important implications for diet quality, while others have less importance or no implications.

The third approach examines food choices across food categories defined by relative nutritional quality. We categorized foods into three groups—foods suggested for frequent, occasional, and selective consumption—based on food descriptions, nutrient content, and the dietary advice provided in the Dietary Guidelines for Americans (DGA) or MyPyramid food guidance system. These data provide a picture of the relative quality of the foods eaten by WIC children and nonparticipant children.

All of these analyses provide information about the types of food WIC children and nonparticipant children are eating. The results provide some insights about food choices that may influence the quality of children's diets. However, a full assessment of diet quality must consider not only the types of food present in the diet, but the total amounts and combinations of food eaten. The analyses presented in Chapter Six take this comprehensive approach.

FOOD CHOICE ANALYSES

Data

- NHANES 1999-2004: Single 24-hour recall per person

Measures

1. Proportion of children consuming WIC-approved foods: milk, cheese, eggs, juice, peanut butter, beans, cereal.
2. Proportion of children consuming foods from food groups defined by a "supermarket aisle approach": 10 broad food groups and 165 subgroups are defined to correspond to supermarket groupings.
3. Percent of food choices from foods categorized by nutritional quality as:
   - *Food to consume frequently* — high relative nutrient density and low SoFAAS.
   - *Food to consume selectively* — high relative nutrient density and moderate amounts of SoFAAS.
   - *Food to consume occasionally* — low nutrient density and/or high amounts of SoFAAS.

WIC-Approved Foods

Foods provided in the current WIC food package for children are listed in Table 5-1. WIC participants obtain WIC foods by redeeming WIC vouchers at approved retailers. Vouchers are preprinted with allowable types and quantities of foods. The flexibility of food offerings varies by food group. Substitutions for fluid milk and eggs are made by the local WIC agency (and printed on vouchers) to meet individual dietary needs. Legumes may be provided as dry beans, as peanut butter, or as a choice of beans or peanut butter. For the cereal and juice categories, participants are given a list of "WIC-Approved Foods" enumerating all brands, types, and package sizes of allowable items that they may choose from. State WIC-approved lists are based on the nutrient require-

Table 5-1—WIC-Approved Foods for Children (WIC Food Package IV)

Food group	Allowed forms and quantity per month	Nutrient requirement
Milk	24 qts fluid whole milk or fluid skim or lowfat milk; Substitutions for fluid milk: • Cultured buttermilk (1 qt for 1qt) • Evaporated whole milk or evaporated skim milk (13 oz for 1qt fluid milk) • Dry whole milk (1 lb for 3qt fluid milk) • Nonfat or lowfat dry milk (1 lb for 5 qt fluid milk) • Cheese (1 lb for 3 qt fluid milk; to maximum of 4 lb of cheese)	Flavored or unflavored whole milk with 100 International Units of vitamin D per qt; *Or* Flavored or unflavored pasteurized fluid skim or lowfat milk with 100 International Units (IU) of vitamin D per qt and 2000 IU of vitamin A per qt. Domestic cheese (pasteurized process American, Monterey Jack, Colby, natural Cheddar, Swiss, Brick, Muenster, Provolone, Mozzarella Part-skim or Whole)
Eggs	2 or 2 ½ doz. fresh eggs 1.5 lb dried egg mix may be substituted for 2 doz; 2 lb dried egg mix may be substituted for 2½ doz.	
Juice	288 fl oz. (9.6 oz/day)	100% fruit or vegetable juice; ≥ 30 mg vitamin C per 100 milliliters
Cereal	36 oz. (3.6 oz/day)	≥ 28 mg iron per 100g ≤ 21.2 g total sugar per 100g
Legumes	1lb Dry beans or peas *Or* 18oz peanut butter	

ments for WIC foods and the cost containment goals of the State.[1]

We identified WIC-approved foods in the NHANES data based on food descriptions. For juices and cereals, we also compared the nutrient content of the food to WIC regulatory requirements.[2] In NHANES 1999-2004, children age 1 to 4 were reported to consume 129 unique brands/types of breakfast cereals. Of those, 38 (30 percent) met the nutrient requirements for WIC-approved cereals under current regulations. Among all 100% fruit or vegetable juices consumed by children age 1 to 4, 42 percent met the vitamin C requirements for WIC approval.

[1] WIC-Approved Food Lists are compiled by State WIC agencies. See Kirlin, et al. (2003) for information on WIC food lists and cost containment practices.

[2] We examined nutrients in individual food records because the nutrient content of food items may change over time.

Consumption of WIC-approved foods

Nearly all children consumed at least one WIC-approved food item on the intake day (Table 5-2). The proportion of WIC children consuming at least one WIC-approved food was not significantly different from the proportions of nonparticipant children (97 percent vs. 95 and 97 percent).

The WIC food package is intended to supplement participants' food intakes. Thus, WIC participants may not consume foods from every WIC food category on any given day. WIC participant children consumed milk, cheese, and WIC-approved juices at about the same rate as nonparticipant children; 87 percent of all children consumed milk, 24 percent consumed cheese, and 28 percent consumed WIC-approved juice (Table 5-2 and Figure 5-1).

Compared with income-eligible nonparticipant children, WIC children were more likely to con-

Table 5-2—Consumption of WIC-Approved Foods

	All Children	WIC Children	Income-eligible Nonparticipating Children	Higher-income Nonparticipating Children
	Percent of children consuming at least once per day			
Sample size[1]	2,531	975	750	698
WIC approved foods				
Any WIC food	96.3	96.8	94.5	97.2
Milk	87.4	87.3	85.4	88.3
Cheese	23.7	23.5	21.4	25.2
Eggs	19.1	24.3	21.3	***13.9
Juice	27.5	30.8	27.6	26.0
Peanut butter	3.9	2.5	2.0	*6.2
Beans	14.2	16.7	16.7	*11.0
Cereal	24.8	30.2	***18.8	25.6

Notes: Significant differences in proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. Standard errors are shown in Appendix D.

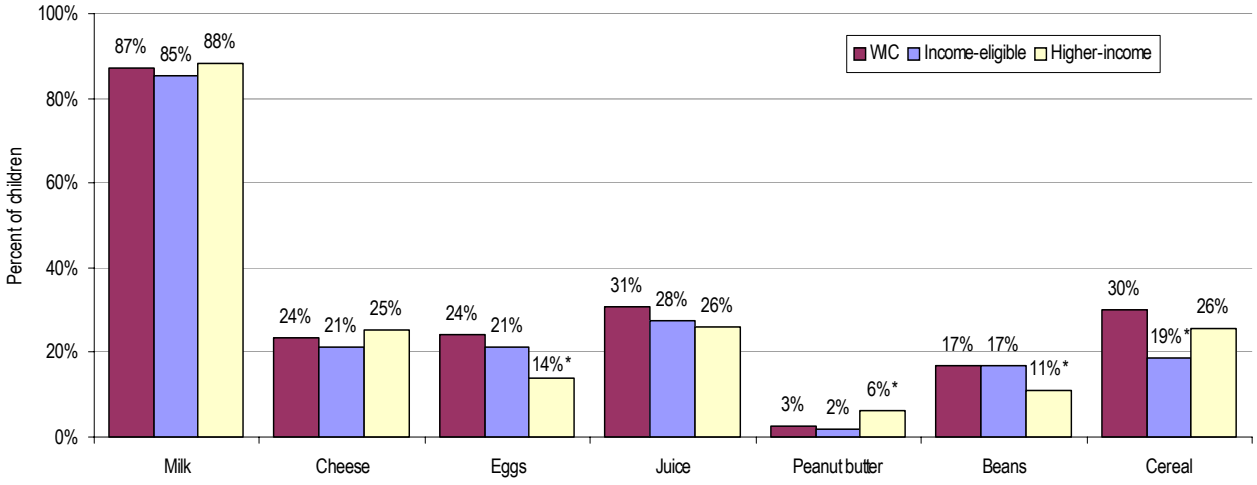
1 Excludes children who consumed infant formula on the intake day.

Source: NHANES 1999-2004 dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

sume WIC-approved cereals (30 percent vs. 19 percent).[3] Compared with higher-income nonparticipant children, WIC children were more likely to consume eggs (24 percent vs. 14 percent) and beans (17 percent vs. 11 percent), and less likely to consume peanut butter (3 percent vs. 6 percent).

[3] Estimates of children's consumption of WIC-approved foods over a two-day period using 24-hour dietary recalls from the Continuing Survey of Food Intakes of Individuals (CSFII, 1994-96, 98) were twice as large as NHANES one-day estimates for juice; about 150 percent larger for cheese, eggs, and cereal; 7 percent larger for milk; and 8 times larger for peanut butter (Oliveira and Chandran, 2005).

Figure 5-1—Percent of Children Consuming WIC-Approved Foods on the Intake Day: By Food Group



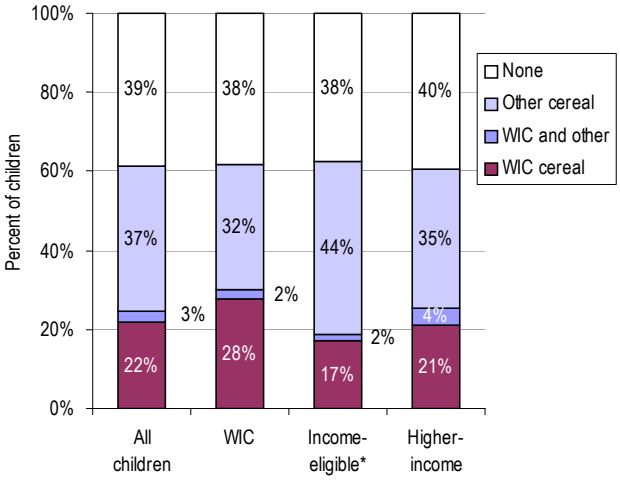
* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

WIC-approved milk, cheese, eggs, beans, and peanut butter have little competition from non-WIC foods in these categories. Therefore, the estimates in Figure 5-1 indicate that 13 percent of WIC children did not consume milk on the intake day, about 75 percent did not consume cheese or eggs, 83 percent did not consume beans, and 97 percent did not consume peanut butter.

As noted in previous studies, WIC-approved cereals compete with non-WIC cereals, and consumption of WIC-approved juices may be influenced by other available non-milk beverages. On the intake day, 62 percent of WIC children consumed cereal: 28 percent consumed WIC-approved cereal, 2 percent consumed both WIC-approved and non-WIC cereal, and 32 percent consumed only non-WIC cereal (Figure 5-2). The distribution of WIC children by types of cereal is comparable to the distribution of higher-income nonparticipant children. Compared with income-eligible nonparticipant children, however, WIC children were equally likely to consume any cereal but more likely to consume WIC-approved cereal.

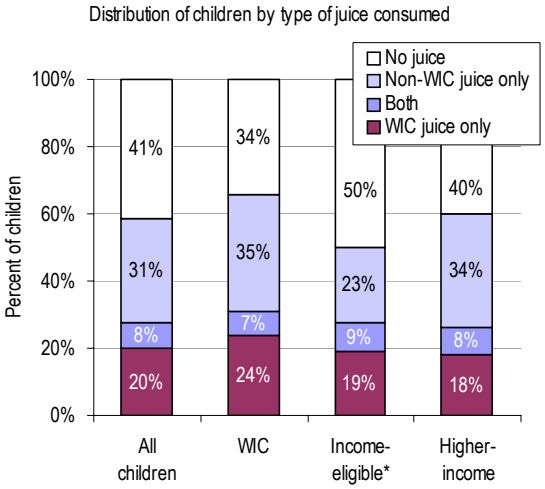
Overall, 59 percent of children age 1 to 4 consumed 100% fruit or vegetable juice on the intake day and 28 percent consumed 100% juices that met WIC standards for vitamin C. Figure 3 shows the distribution of WIC participants and nonparticipants consuming "WIC juice only," "non-WIC

Figure 5-2—Percent of Children Consuming WIC-Approved Cereals and Other Cereals



* Denotes statistically significant difference in distribution compared with WIC participants. Estimates are age adjusted.

Figure 5-3—Percent of Children Consuming WIC-Approved Juices and Other Juices



* Denotes statistically significant difference in distribution compared with WIC participants. Estimates are age adjusted.

juice only," and both. Less than 10% of children consumed both, while non-WIC juice was more common than WIC juice for both participants and nonparticipants. The distribution of WIC children by types of juice is not significantly different from higher-income nonparticipant children, but WIC children were more likely than income-eligible children to consume WIC juice and less likely to consume non-WIC juice.

Other sweetened beverages (soda and noncarbonated sweetened beverages) were consumed by 69 percent of children on the intake day (Table C-11). WIC children were less likely than income-eligible children to consume any sweetened beverages (57 vs. 67 percent) and less likely than income-eligible children to consume only sweetened beverages and no 100% juice (25 vs. 39 percent).

Food Choices—Supermarket Aisle Approach

To describe the full range of food choices for WIC children and nonparticipant children, we used a supermarket aisle approach to assign all foods in the NHANES data to one of 10 major food groups (Table 5-3). Within the major food groups, we identified 165 subgroups to capture the different types of food available within each group. The analysis examined the proportions of WIC children

Table 5-3—Food SubGroups Used to Classify Types of Food Eaten by Children Age 1-4

1. Grains
Bread
Rolls
English muffin
Bagels
Biscuits, scones, croissants
Muffins
Cornbread
Corn tortillas
Flour tortillas
Taco shells
Crackers
Breakfast/granola bar
Pancakes, waffles, French toast
Cold cereal
Hot cereal
Rice
Pasta

2. Vegetables
Raw vegetables
Raw lettuce/greens
Raw carrots
Raw tomatoes
Raw cabbage/coleslaw
Other raw (high nutrients)[a]
Other raw (low nutrients)[a]
Salads (w/greens)
Cooked vegetables, excluding potatoes
Cooked green beans
Cooked corn
Cooked peas
Cooked carrots
Cooked broccoli
Cooked tomatoes
Cooked mixed
Cooked starchy
Other cooked deep yellow
Other cooked dark green
Other cooked (high nutrients)[a]
Other cooked (low nutrients)[a]
Other fried
Cooked potatoes
Cooked potatoes-not fried
Cooked potatoes-fried
Vegetable juice

3. Fruit & 100% fruit juice
Fresh orange
Fresh other citrus
Fresh apple
Fresh banana
Fresh melon
Fresh watermelon
Fresh grapes
Fresh peach/nectarine
Fresh pear
Fresh berries
Other fresh fruit
Avocado/guacamole
Lemon/lime - any form
Canned or frozen fruit, total
Canned or frozen in syrup
Canned or frozen, no syrup
Applesauce,canned/frozen apples
Canned/frozen peaches
Canned/frozen pineapple
Other canned/frozen
Fruit juice
Non-citrus juice
Citrus juice
Dried fruit

4. Milk, cheese, yogurt
Unflavored whole milk
Unflavored 2% milk
Unflavored 1% milk
Unflavored skim milk
Unflavored milk-% fat nfs
Flavored whole milk
Flavored 2% milk
Flavored 1% milk
Flavored skim milk
Flavored milk-% fat nfs
Soymilk
Dry or evaporated milk
Yogurt
Cheese

5. Meat and meat alternates
Beef
Ground beef
Pork
Ham
Lamb and misc. meats
Chicken
Turkey
Organ meats
Hot dogs
Cold cuts
Fish
Shellfish
Bacon/sausage
Eggs
Beans (dry, cooked)
Baked/refried beans
Soy products
Protein/meal enhancement
Nuts
Peanut/almond butter
Seeds

6. Mixed dishes
Tomato sauce & meat (no pasta)
Chili con carne
Meat mixtures w/ red meat
Meat mixtures w/ chicken/turkey
Meat mixtures w/ fish
Hamburgers/cheeseburgers
Sandwiches (excl hamburger)
Hot dogs
Luncheon meat
Beef,pork,ham
Chicken,turkey
Cheese (no meat)
Fish
Peanut butter
Breakfast sandwiches
Pizza (no meat)
Pizza w/ meat
Mexican entrees
Macaroni & cheese
Pasta dishes, Italian style
Rice dishes
Other grain mixtures
Meat soup
Bean soup
Grain soups
Vegetables mixtures (inc soup)

7. Beverages (excl. milk and 100% fruit juice)
Coffee
Tea
Beer
Wine
Liquor
Water
Regular soda
Sugar-free soda
Noncarbonated sweetened beverage
Noncarbonated low-calorie/ sugar free beverage

8. Sweets and desserts
Sugar and sugar substitutes
Syrups/sweet toppings
Jelly
Jello
Candy
Ice cream
Pudding
Ice/popsicles
Sweet rolls
Cake/cupcakes
Cookies
Pies/cobblers
Pastries
Doughnuts

9. Salty snacks
Corn-based salty snacks
Pretzels/party mix
Popcorn
Potato chips

10. Added fats and oils
Butter
Margarine
Other added fats
Other added oils
Salad dressing
Mayonnaise
Gravy
Cream cheese
Cream /sour cream

[a] "Other raw" and "Other cooked" vegetables include all vegetables not categorized separately. Within these two groups, vegetables in the top quartile of the distribution of Vitamins A or C per 100 grams were categorized as "high in nutrients"; all others are "low in nutrients."
Raw vegetables, high in nutrients include peppers (sweet and hot), broccoli, cauliflower, green peas, seaweed, and snowpeas.
Raw vegetables, low in nutrients include onions, cucumbers, celery, radishes, and mushrooms.
Cooked vegetables, high in nutrients include cabbage, peppers, asparagus, cauliflower, brussel sprouts, snowpeas, and squash.
Cooked vegetables, low in nutrients include artichokes, onions, mushrooms, eggplant, beets, and yellow string beans.

and nonparticipant children who consumed one or more foods in each food group/subgroup on the intake day.

The discussion of results is organized by major food group. Each section begins with a description of the percentage of all children who consumed foods from that major food group (Figure 5-4) and the differences, if any, in the proportions of WIC children and nonparticipant children (Figure 5-5). We then compare the subgroup choices of children who consumed any foods in the major groups.

The percentages reported throughout this section are of children consuming one or more foods in a given food group, in any amount, during the preceding 24-hours. Results are based on foods reported as discrete food items. That is, mixed dishes and soups, salads, and sandwiches reported as combination foods were not broken down into their various components (for example, a soup may contain vegetables, chicken, and pasta; a sandwich might contain bread, meat, cheese, and vegetables).[4]

[4] Appendix A discusses the reporting of combination foods in the NHANES food files.

Figure 5-4—Percent of Children Age 1-4 Eating Any Foods from 10 Broad Food Groups

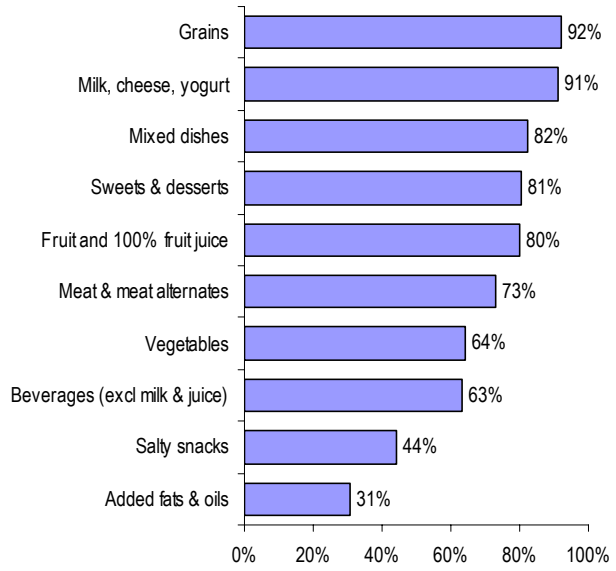
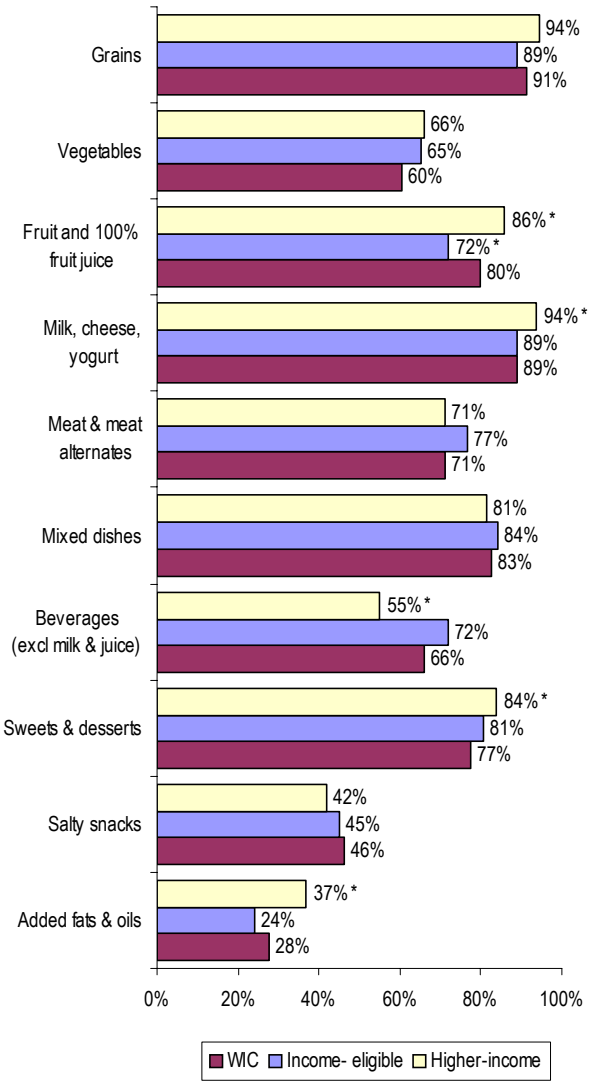


Figure 5-5—Percent of WIC Children and Nonparticipant Children Eating Any Foods from 10 Broad Food Groups



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Grains

Overall, 92 percent of all children consumed a grain or a grain-based food that was not part of a mixed dish or combination item such as sandwiches, macaroni and cheese, or pizza (Figure 5-4). There were no significant differences between WIC children and either group of nonparticipant children in the proportions who consumed one or more grain-based foods (Figure 5-5).

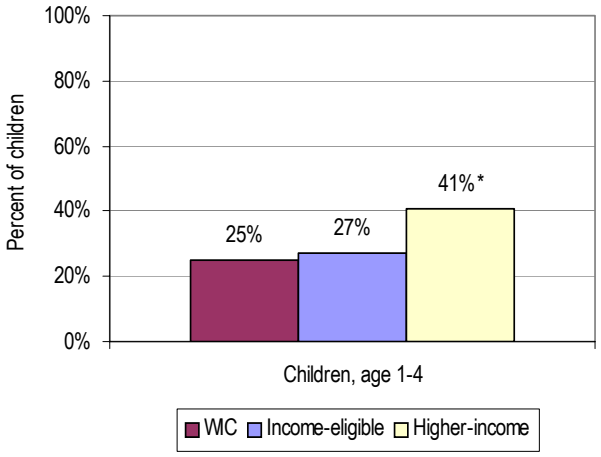
Consumption of whole grains was low for all groups—overall, only 32 percent of children ate one or more foods that were whole grain (Table C-11).[5] The proportion of WIC children who consumed whole grains was significantly lower than higher-income nonparticipant children (25 percent vs. 41 percent), but comparable to low-income nonparticipant children (27 percent) (Figure 5-6).

Cold cereal was the most common grain-based food, consumed by 53 percent of all children. Crackers and bread were the next most common foods in this group (28 percent and 26 percent, respectively) (Table C-11). The types of grain-based foods consumed by WIC children and income-eligible nonparticipant children were comparable, except that corn tortillas were more common among WIC children (9 percent vs. 3 percent).

There were several differences between WIC children and higher-income nonparticipant children in the types of grain-based foods eaten (Table 5-4 and Table C-11). WIC children were less likely than higher-income nonparticipant children to eat some breakfast foods that are alternatives to cereal, specifically, breakfast/granola bars and pancakes, waffles, or French toast. In addition, WIC children were more likely than higher-income nonparticipant children to eat corn and flour tortillas and taco shells.

[5] The MyPyramid Equivalents database indicates the number of whole grain ounce equivalents and non-whole grain ounce equivalents for each food in the NHANES individual food file. We coded foods as either whole grain or non-whole grain according to the category with the greater number of ounce equivalents.

Figure 5-6—Percent of Children Age 1-4 Eating Whole Grain Foods



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Table 5-4—Grain Choices of WIC Participants Compared with Higher Income Nonparticipants

WIC participants were less likely to eat ...	WIC participants were more likely ...
Breakfast/ granola bar; Pancakes/ waffles/French toast	Corn and flour tortillas; Taco shells

Note: Food groups with significant between-group differences are included if reported by at least 2 percent of children. See Table C-11.

Vegetables

Overall, 64 percent of children consumed at least one vegetable as a discrete food item (Figure 5-4). There were no statistically significant differences in rates of vegetable consumption for WIC children and nonparticipant children (Figure 5-5).

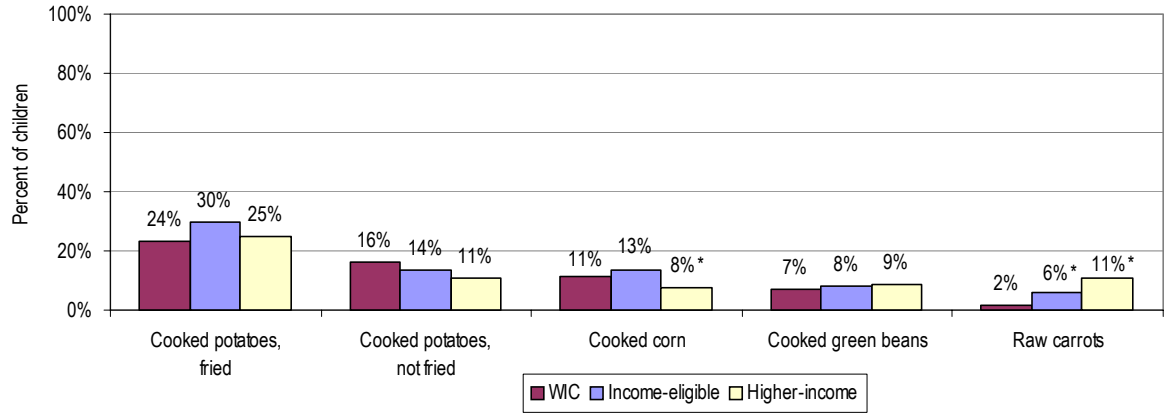
Among all children, cooked potatoes were the most common type of vegetable consumed (37 percent), followed by other types of cooked vegetables (34 percent) and raw vegetables (16 percent) (Table C-11). These general patterns were observed for all three groups of children.

The specific vegetables that were most commonly consumed included fried potatoes, other types of cooked potatoes, cooked corn, cooked green beans, and raw carrots (Figure 5-7 and Table C-11). WIC children were significantly less likely than either group of nonparticipant children to eat raw carrots (2 percent vs. 6 and 11 percent). Compared with higher-income nonparticipant children, WIC children were more likely to eat cooked potatoes (not fried) and cooked corn.

Fruit

Eighty percent of children consumed fruit or 100% fruit juice on the day covered in the 24-hour recall (Figure 5-4). Compared with income-eligible nonparticipant children, WIC children were more likely to consume fruit or 100% juice than income-eligible nonparticipant children but were less likely

Figure 5-7—Percent of Children Age 1-4 Eating the Five Most Common Vegetables

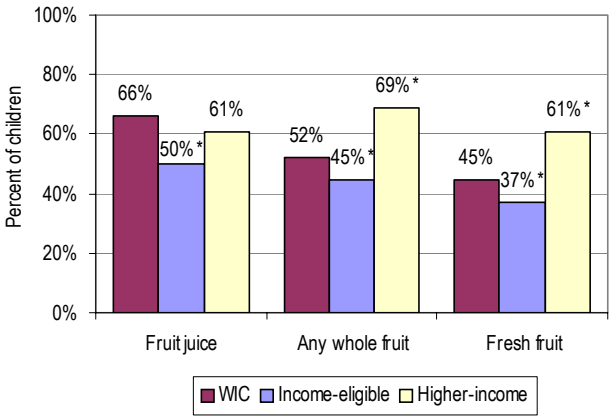


* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.
The five vegetables in the figure were the only vegetables consumed by at least 10 percent of children age 1-4 years old.

to do so than higher-income nonparticipant children (80 percent vs. 72 and 86 percent) (Figure 5-5).

WIC children were more likely to consume fruit juice than income-eligible of nonparticipant children (Figure 5-8). WIC children were more likely to consume any whole fruit (fresh, canned, or dried) compared with income-eligible nonparticipant children (52 percent vs. 45 percent), and more likely to consume fresh fruit (45 vs. 37 percent) (Figure 5-8). WIC children were less likely than higher-income nonparticipant children to consume any whole fruit (52 percent vs. 69 percent) and also less likely to consume fresh fruit (45 percent vs. 61 percent).

Figure 5-8—Percent of Children Age 1-4 Consuming Fresh Fruit and Fruit Juice



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Milk and milk products

Overall, 91 percent of children consumed milk or milk products (cheese or yogurt) on the intake day (Figure 5-4). The proportion of WIC children who consumed milk or milk products was the same as the proportion of income-eligible nonparticipant children, but significantly lower than higher-income nonparticipant children (89 percent vs. 94 percent) (Figure 5-5 and Table C-11).

The American Academy of Pediatrics recommends whole milk for one-year-olds and reduced-fat milk (2 percent milk fat or less) for older children (AMA, 2007), and the revised WIC food packages incorporate these recommendations. Among the children surveyed in NHANES 1999-2004, one-year-olds were about 3 times as likely to consume unflavored whole milk compared with unflavored reduced fat milk; 2-4-year-olds were about equally likely to consume unflavored whole milk and unflavored reduced-fat milk (Figure 5-9 and Table C-12). Among one-year-olds, there were no statistically significant differences in the proportions of WIC children and nonparticipant children consuming whole or reduced-fat milk.

Among 2-4-year-olds, WIC children were significantly more likely than either group of nonpartici-

Figure 5-9—Percent of Children Consuming Whole and Reduced-Fat Milk, By Age Group

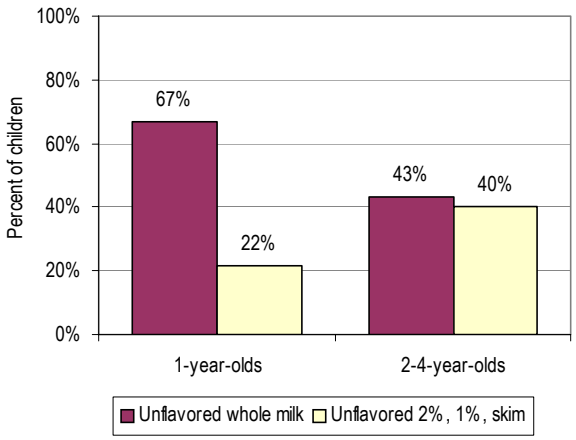


Figure shows percents of all children, including WIC participants and nonparticipants. Differences in percents shown were not tested for statistical significance.

pant children to consume unflavored whole milk (58 percent vs. 45 and 32 percent) (Figure 5-10). In comparison with higher-income children, WIC children were also significantly less likely to consume reduced fat milks (2%, 1%, or skim), whether flavored or unflavored, and more likely to consume flavored whole milk (Figure 5-10).

About 30 percent of WIC children and both groups of nonparticipant children consumed cheese (Table C-11). WIC children, however, were less likely than higher-income nonparticipant children to consume yogurt (6 percent vs. 16 percent) (Table C-11).

Meats and meat alternates

Roughly three-quarters of all children reported eating a meat or meat alternate that was not part of a mixed dish (Figure 5-4). There were no significant differences between WIC participants and either group of nonparticipants in this regard (Figure 5-5).

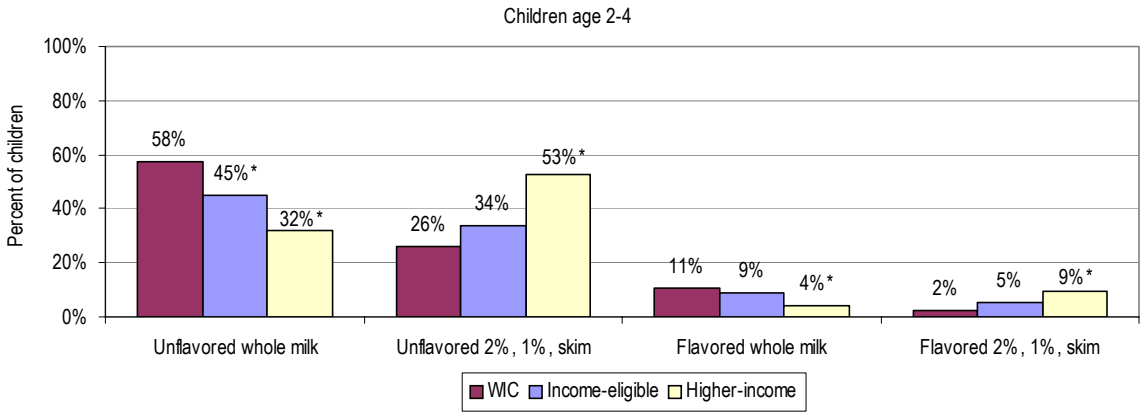
There were no statistically significant differences in the types of meat consumed by WIC children and income-eligible nonparticipant children. In contrast, there were several significant differences between WIC children and higher-income nonparticipant children. Specifically, WIC children were more likely than higher-income nonparticipant children to eat beef, eggs, and dried beans (Table 5-5 and C-11).

Mixed dishes

Overall, about 80 percent of all children consumed one or more mixed dishes on the intake day (Figure 5-4). The proportions of WIC children and nonparticipant children who consumed mixed dishes were about equal (Figure 5-5).

Sandwiches were the most commonly reported type of mixed dish, consumed by 36 percent of all children (Table C-11). There were no differences between WIC children and income-eligible children

Figure 5-10—Percent of Children Age 2-4 Consuming Whole Milk and Reduced-Fat Milk



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted. Children may report multiple types of milk during the preceding 24 hours.

in the types of mixed dishes consumed. Differences between WIC children and higher-income nonparticipant children are shown in Table 5-5.

Beverages, excluding milk and 100% fruit juice

About two-thirds of all children consumed a beverage other than milk or 100% fruit juice on the intake day (Figure 5-4).[6] WIC children were more likely to consume these beverages than higher-income nonparticipant children (66 percent vs. 55 percent) (Figure 5-5).

Among all children, the most commonly consumed beverages were noncarbonated, sweetened drinks like fruit punch, Hi-C, lemonade, and breakfast drinks (39 percent) and regular (not sugar-free) sodas (30 percent) (Table C-11). WIC children were less likely than income-eligible nonparticipant children to consume noncarbonated, sweetened drinks (33 percent vs. 45 percent) (Figure 5-11). Compared with higher-income nonparticipant children, WIC children were more likely to consume regular (not sugar-free) sodas (36 percent vs. 22 percent). Similar proportions of WIC participants and nonparticipants consumed tea and sugar-free sodas.

Sweets and desserts

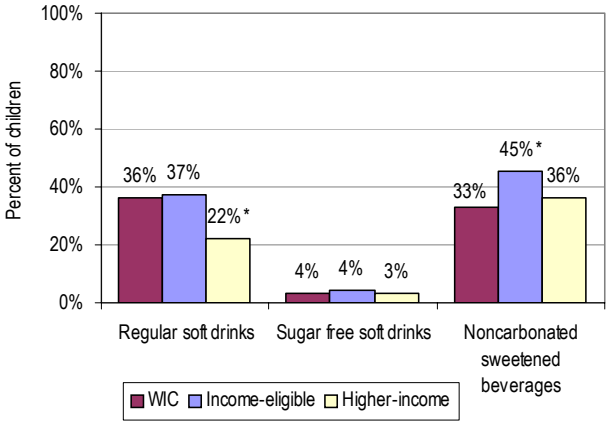
Overall, about eight in ten children reported eating at least one type of sweet or dessert on the intake day (Figure 5-4). Cookies, candy, ice cream, and syrups/sweet toppings were the most commonly reported foods in this group (Table C-11). The proportions of WIC children and income-eligible nonparticipant children who ate sweets or desserts were not significantly different. However, WIC children were significantly less likely than higher-income children to eat these foods (77 percent vs. 84 percent) (Figure 5-5).

There were no statistically significant differences in the proportions of WIC children and nonparticipant children who consumed cookies (about 40 percent), candy (about 30 percent), and ice cream (about 17 percent) (Table C-11). WIC children were less likely than higher-income nonparticipant children to eat syrup and other sweet toppings (this is consistent with the previously reported differences in the proportion of children who consumed pancakes, waffles, and French toast), and more likely to eat sugar and sugar substitutes and sweet rolls (Table C-11).

Salty snacks

Overall, 44 percent of children consumed salty snack foods on the intake day (Figure 5-4). There were no significant differences between WIC children and either group of nonparticipant children in the frequency of salty snacks (Figure 5-5). WIC children were significantly less likely to eat popcorn and more likely to eat corn-based salty snacks, relative to higher-income nonparticipant children. Between-group differences for other types of salty snacks (potato chips and pretzels/party mix) were not statistically significant (Table C-11).

Figure 5-11—Percent of Children Age 1-4 Consuming Beverages Other than Milk and 100% Fruit Juice



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

[6] NHANES dietary recalls did not collect data on water intake.

Table 5-5—Meat and Mixed Dish Choices of WIC Participants Compared with Higher Income Nonparticipants

Food group	WIC participants were less likely to eat ...	more likely ...
Meat	n.a.	Beef; Eggs; Beans (dry, cooked)
Mixed dishes	Pizza w/no meat); Macaroni & cheese	Meat soups; Grain soups

n.a. Not applicable

Note: Food groups with significant between-group differences are included if reported by at least 2 percent of children. See Table C-11.

Added fats and oils

Overall, 31 percent of children were reported to have butter, margarine, salad dressings, or other added fats with the foods they consumed (Figure 5-4). (This does not include fat that may have been added in cooking). A lower proportion of WIC children consumed added fats, compared with higher-income nonparticipants (28 percent vs. 37 percent) (Figure 5-5).

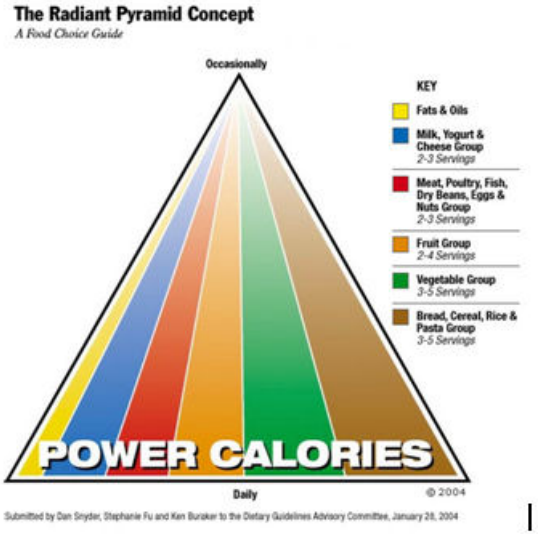
Among WIC children and income-eligible nonparticipant children, frequencies of consumption were comparable for different types of fats (Table C-11). Compared with higher-income nonparticipant children, however, WIC children were less likely to consume salad dressings and butter.

Food Choices—Nutritional Quality Approach

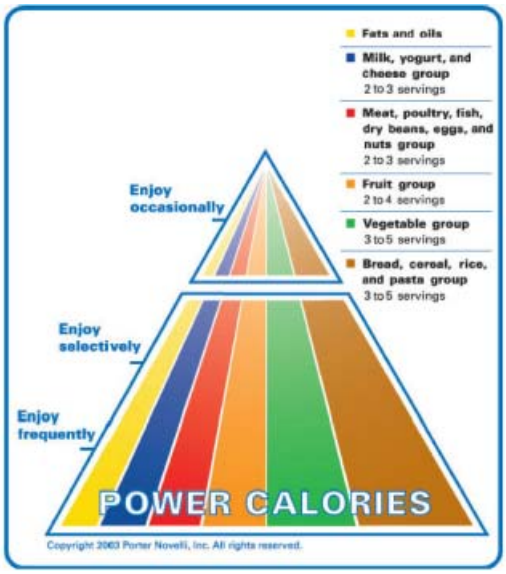
Our third method for examining the food choices of WIC children and nonparticipant children considers the nutritional quality of foods. The approach is based on the radiant pyramid/power calories concept, as described by Zelman and Kennedy (2005). As shown in Figure 5-12 the radiant pyramid concept was presented as an idea to the committee developing the 2005 edition of the DGAs, and the basic concept was incorporated into the MyPyramid food guidance system. The expanded radiant pyramid, described by Zelman and Kennedy and illustrated on the right side of Figure 5-12, uses data on nutrient density to identify "power calorie" foods. The idea is that, within each food group, the most nutrient-dense food choices provide "power calories" and should be enjoyed frequently; foods with lower nutrient

Figure 5-12—Radiant Food Pyramid: Basic and Expanded Concepts

1) Radiant Pyramid Concept recommended to the DGA Committee.



2) MyPyramid adoption of the radiant pyramid concept.



3) Expanded radiant pyramid to emphasize food choices within food groups (Zelman and Kennedy, 2005)

density should be enjoyed selectively; and the least nutrient-dense foods in a food group should be enjoyed only occasionally. Choosing foods according to these guidelines makes it easier to obtain recommended levels of nutrients while maintaining energy balance.

Implementation of the radiant pyramid concept

Categorizing foods into groups corresponding to the radiant pyramid is not straightforward. We explored the idea of using NR scores (described in Chapter 4) to sort foods into the three categories. However, we found this approach less than satisfactory for several reasons.

First, highly fortified foods have higher NR scores than their less-fortified counterparts, leading to some classifications that are not consistent with the basic nutrient density message. For example, highly fortified breakfast cereals, even those containing substantial amounts of sugar and/or fat, ranked much higher than whole wheat bread and unprocessed oatmeal, foods that should certainly be included in the "enjoy frequently" section of a radiant grain group.

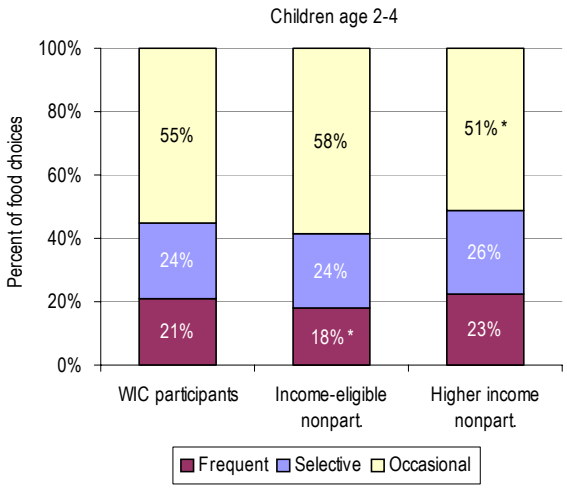
Second, foods that provide relatively few nutrients but are very low in calories may be ranked higher than foods that provide substantially more nutrients but are also higher in calories. For example, in the vegetable group, raw iceberg lettuce has an NR score of 466.9, compared with 255.8 for cooked carrots (no fat added).

Finally, because the NR score does not include a "penalty" for fat or sugar, foods that are concentrated sources of one or more nutrients may be ranked substantially higher than foods that are lower in calories and generally recommended as more optimal choices. For example, in the meat group, the items that received the highest NR scores (506.7 to 636.2) were livers, most of which were fried. Moreover, many beef items that included fat or were prepared with added fat scored higher than chicken items (NR of 130.4 for broiled steak, lean and fat eaten vs. NR of 91.1 for broiled, skinless chicken breast).

Because of the inherent limitations of NR scores for individual foods, we used an iterative process that used food descriptions and information about SoFAAS and total fat content to categorize foods into the three categories corresponding to the radiant pyramid concept of foods to consume frequently, selectively, and occasionally. We categorized foods within each of the 165 food subgroups listed in Table 5-3. Decision rules were informed by general dietary guidance provided in the *Dietary Guidelines for Americans* and *MyPyramid* which encourage consumption of nutrient-dense foods—foods in their their lowest-fat form with no added sugar. For example, whole grains, fruits and vegetables without added fat or sugar, fat-free and low-fat (1%) milk, and lean meat, fish, and poultry were all classified as foods to consume frequently. For other foods, data on calories from SoFAAS and/or total fat were used to divide foods within a food subgroup so that foods with the lowest proportion of calories from SoFAAS/total fat content were included in the "consume frequently" category and foods with the highest proportion of calories from SoFAAS/total fat content were included in the "consume occasionally" category.

The rules used in assigning foods to the three consumption categories are summarized in Table 5-6. Table A-4 shows the number and percent of foods in the NHANES individual food files that

Figure 5-13—Percent of Food Choices From Foods Suggested for Frequent, Selective, or Occasional Consumption



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted

Table 5-6—Categorization of Foods Suggested for Frequent, Selective, and Occasional Consumption

Food Group	Consume frequently	Consume selectively	Consume occasionally
Grains	All breads, rolls, bagels, etc. with 100% wheat, other "wheat," oatmeal, oat bran, or multi-grain description (USDA food code series 512, 513, 515, and 516); other 100% whole wheat/high-fiber breads; whole wheat, high-fiber pancakes and waffles; whole wheat pasta and noodles cooked without added fat; brown rice cooked without added fat; cold cereals with SoFAAS < 20; wheat bran, raw oats, wheat bran; oatmeal, whole wheat, and bran hot cereals cooked w/o added fat	Other breads, rolls, bagels, tortillas, crackers, etc. unless fat per 100 gm > 8.0; whole wheat pasta or noodles cooked with added fat; brown rice cooked with added fat; other pasta, noodles, and rice cooked without added fat; cold cereals with SoFAAS ≥ 20 but < 35; oatmeal, whole wheat, and bran hot cereals cooked with added fat; other hot cereals cooked w/o added fat	Stuffing, bread sticks, croutons, croissants, biscuits (unless low-fat); other breads, rolls, etc. with fat per 100 gm > 8.0; other pasta, noodles, and rice cooked with added fat; chow mein noodles; cold cereals with SoFAAS ≥ 35; other hot cereals cooked with added fat
Vegetables	All raw and cooked vegetables without added fat, except potatoes and other starchy vegs; spaghetti sauce w/o meat	Cooked vegetables with added fat, except fried; mashed potatoes; other cooked starchy vegs without added fat; spaghetti sauce w/ meat	All fried vegetables; cooked starchy vegs with added fat (other than mashed potatoes); veg salads with creamy dressing; vegs w/ cheese or cheese sauce; creamed vegs; glazed vegs
Fruit and 100% fruit juice	All fresh fruits w/o added sugar; other types of fruits and juice: fruits canned in water or juice w/ no added sugar; frozen fruits w/o added sugar; dried papaya; unsweetened citrus juices (incl. blends); other unsweetened juices with added vitamin C; fruits and juices with NS as to sweetener and SoFAAS = 0	Fresh fruits with added sugar; other types of fruits and juice: fruits canned in light or medium syrup; unsweetened dried fruit other than papaya; fruits with NS as to sweetener/syrup and SoFAAS > 0; unsweetened (SoFAAS = 0) non-citrus juices w/o added vitamin C	Fruits canned in heavy syrup; fruits with dressing, cream, marshmallows, chocolate, or caramel; guacamole; all pickled or fried fruits; maraschino cherries; pie filling; fruit soups; frozen juice bars; fruit smoothies; sweetened (SoFAAS > 0) juices; fruit nectars
Milk and milk products	Unflavored nonfat, skim, 1%, or lowfat fluid/dry milks; NFS unflavored fluid/dry milks with SoFAAS ≤ unflavored 1% milk (21.1) All plain yogurt, except from whole milk; fruited or flavored nonfat or lowfat yogurt with low-cal sweetener Non-fat and low-fat cheeses that meet gm fat criteria; cottage cheese except with added fruit/gelatin	Flavored/malted nonfat, skim, 1%, or lowfat fluid milks; unflavored 2% or reduced fat fluid milks; NFS fluid/dry milks and other milk-based beverages/mixtures with SoFAAS > unflavored 1% milk but ≤ unflavored 2% milk. Fruited or flavored nonfat and lowfat yogurts with added sugars, with SoFAAS ≤ 48.9. Low-fat cheeses that meet gm fat criteria; cottage cheese with added fruit/gelatin	Flavored/malted 2% or reduced fat fluid/dry milks; all types of whole fluid/dry milks; NFS fluid/dry milks and other milk-based beverages/mixtures with SoFASS > unflavored whole milk (33.3) All whole milk yogurts; other yogurt with SoFAAS > 48.9. All regular cheeses; cheese sauces, dips, fondues
Meat and meat alternates	Meat and poultry with fat per 100 gm ≤ 9.28 unless fried and (for chicken) skin eaten. Fish with fat per 100 gm > 9.28 and SoFAAS = 0 unless fried. Egg whites	Meat and poultry with fat per 100 gm > 9.28 but ≤ 18.56 unless fried and (for chicken) skin eaten; fish that meet gm fat criteria and SoFAAS > 0 unless fried. Cooked whole eggs or egg substitutes with no added fat, cheese, or bacon/sausage; other egg/egg substitute mixtures with total fat < 11.21 (max for whole egg cooked w/o fat)	All fried meat, fish, and poultry with skin; meat and poultry with fat per 100 gm > 18.56; fish that meet gm fat criteria and SoFAAS > 0. Cooked whole eggs with added fat, cheese, or bacon/sausage; egg yolks only; other egg/egg substitute mixtures with total fat ≥ 11.21 (max. for whole egg cooked w/o fat)

-Continued

Table 5-6—Categorization of Foods Suggested for Frequent, Selective, and Occasional Consumption —Continued

Food Group	Consume frequently	Consume selectively	Consume occasionally
Meat and meat alternates (continued)	Legumes cooked without added fat[a]	Legumes cooked with added fat; peanut butter; nuts and seeds; soy-based meat subs[a]	Soy-based meal replacements, supplements; legumes with cheese or meat; peanut butter with jelly; nuts with dried fruits; soy-based desserts[a]
Mixed dishes	Mixed dishes with gm fat/100 gm ≤ 4.64 or gm fat ≤ 9.28 and SoFAAS = 0	Unless SoFAAS = 0, mixed dishes with fat per 100 gm > 4.64 but ≤ 9.28	All mixed dishes with fat per 100 gm > 9.28
Beverages, excl. milk and 100% fruit juice	Sugar free and low-calorie beverages		Sweetened beverages, alcoholic beverages
Sweets and desserts		Pudding, frozen yogurt, light/non-fat ice cream (excl. novelties), sugar-free candy, sugar-free gelatin	All else
Salty snacks		Lowfat/nonfat/baked chips, unflavored pretzels, air-popped popcorn w/o butter	All else
Added fats, oils, and condiments	Fat-free. Sugar-free versions, with SoFAAS < 20 and fat per 100 gm < 10	Low-fat, low-sugar versions, SoFAAS > 20 but < 90 and fat per 100 gm > 10	Regular versions, SoFAAS > 90

[a]Legumes are counted as meat until a person's meat intake reaches 2.5 ounce equivalents per 1000 kcal, then legumes count as vegetables (HEI-2005).

were assigned to each category, by major food group and subgroups.

Children under age 2 were excluded from this analysis because the DGAs and MyPyramid recommendations apply to individuals 2 years and older.

Overall quality of food selections

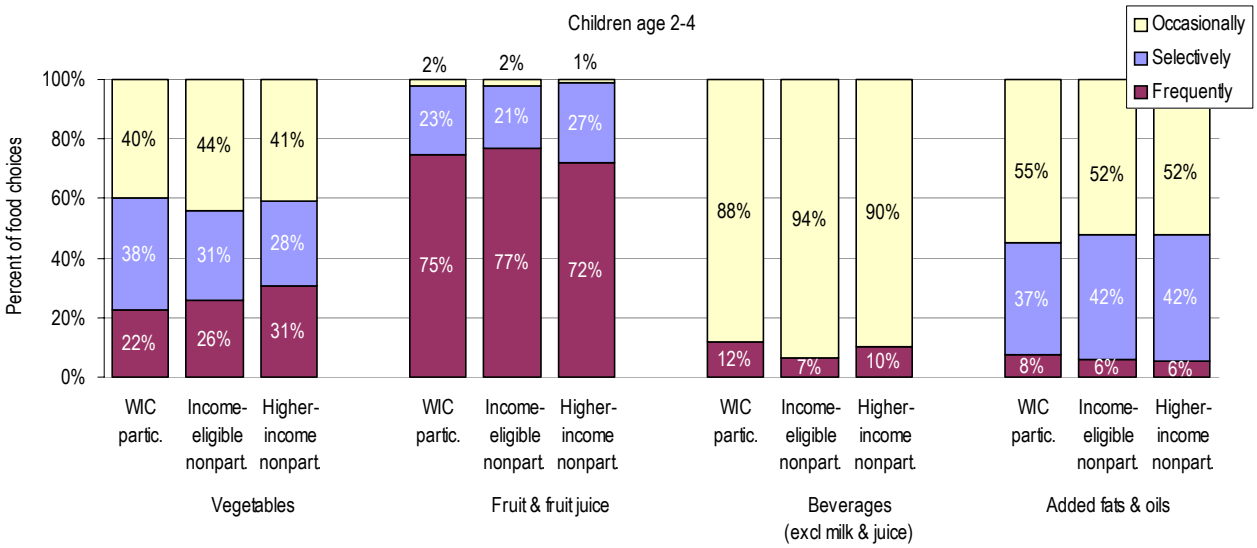
There were small differences in the overall quality of the foods consumed by WIC children and nonparticipant children, in terms of the distribution of foods suggested for frequent, selective, and occasional consumption (Figure 5-13 and Table C-13). Compared with income-eligible nonparticipant children, a larger percentage of the foods consumed by WIC children were foods to consume frequently (21 percent vs. 18 percent). On the other hand, in comparison with higher-income nonparticipant children, a larger percentage of the foods consumed by WIC children were foods to consume occasionally (55 percent vs. 51 percent).

Ideally, the percent of foods suggested for frequent consumption (bottom of the bar charts) should comprise the majority of food choices, and foods suggested for occasional consumption (top of the bar chart) should comprise fewer choices. Food choices were "top heavy" for all three groups of children.

Food choices within food groups

In four of ten major food groups— vegetables, fruit, beverages other than milk and 100% juice, and added fats and oils—the relative nutritional quality of the foods consumed by WIC children and nonparticipant children was comparable (Figure 5-14). Fruit is the only food group for which a majority of foods came from the "consume frequently" category. In our classification, all fruits without added sugar, and all 100% juices were included in the "consume frequently" category. In contrast, most food choices in the beverages category came from the "consume occasionally" category (sweetened drinks and regular sodas).

Figure 5-14—Percent of Food Choices From Foods Suggested for Frequent, Selective, or Occasional Consumption: Vegetables, Fruit, Beverages, and Added Fats

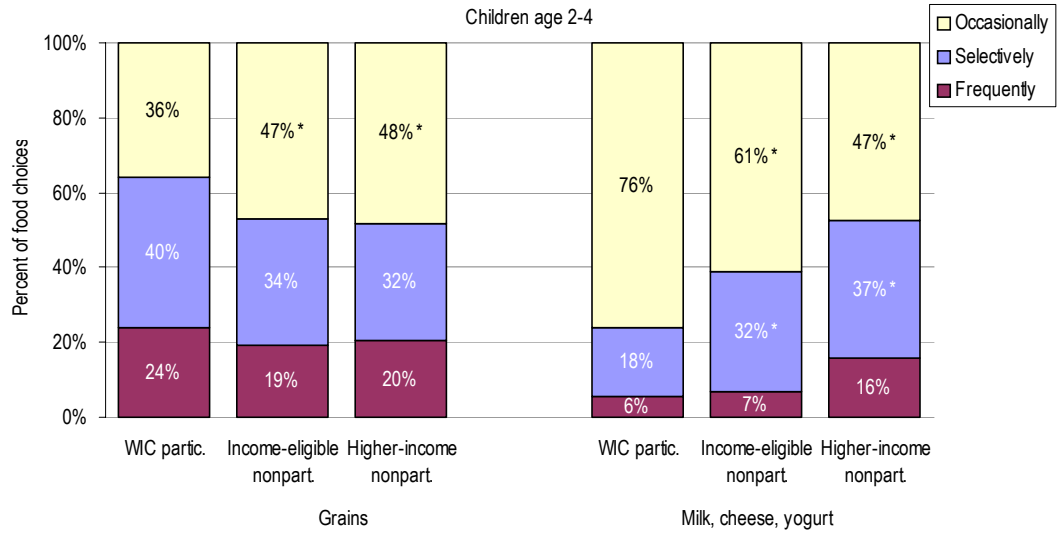


Notes: Differences between WIC participants and each group of nonparticipants are not statistically significant. Estimates are age adjusted.

For grains and milk/milk products, WIC children consumed foods that were different in nutritional quality than the foods consumed by either income-eligible or higher-income nonparticipant children (Figure 5-15). WIC children were less likely than nonparticipant children to have "top heavy" consumption in the grain group— that is, they were less likely to consume grains from the "consume occasionally" category (36 percent vs. 47 and 48 percent). WIC participants were less likely than nonparticipants to consume the following foods from the "occasional" category: waffles, French toast sticks, high sugar cereals, and biscuits.

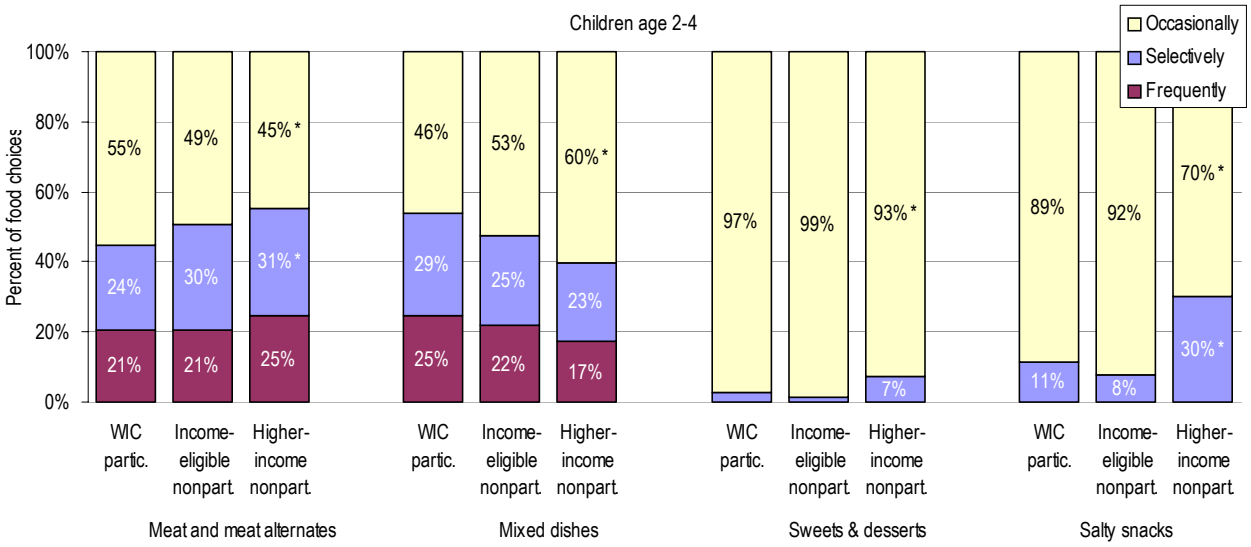
For milk and milk products, the pattern was reversed with WIC children being more likely than

Figure 5-15—Percent of Food Choices From Foods Suggested for Frequent, Selective, or Occasional Consumption: Grains and Milk, Cheese, Yogurt



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Figure 5-16—Percent of Food Choices From Foods Suggested for Frequent, Selective, or Occasional Consumption: Meat, Mixed Dishes, Sweets, and Salty Snacks



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

nonparticipant children to have 'top heavy' consumption (76 percent of all milk/milk products from the "consume occasionally" category vs. 61 and 47 percent). This is consistent with the previously reported finding that WIC children were more likely than either group of nonparticipant children to consume whole milk (Figure 5-10).

Finally, for meats/meat alternates, sweets and desserts, mixed dishes, and salty snacks, the relative nutritional quality of foods consumed by WIC children was comparable to income-eligible nonparticipant children; but there were statistically significant differences between WIC children and higher-income nonparticipant children (Figure 5-16). For meats/meat alternates, sweets and desserts, and salty snacks, WIC children were more likely than higher-income nonparticipant children to consume foods categorized for occasional consumption, and less likely to consume foods categorized for selective consumption. The pattern was reversed for mixed dishes, with the foods consumed by WIC children being less "top heavy" than the foods consumed by higher-income nonparticipant children.

Summary

This chapter used three methods to compare the food choices of WIC participants and nonparticipants: a) consumption of "WIC foods," b) food choices at the level of major food group and subgroup (supermarket aisle approach), and c) the nutritional quality of food choices.

WIC foods

Children participating in WIC receive a food package with foods in five categories: milk and cheese; eggs; 100% fruit juice; iron-fortified cereal; and dry beans/peas or peanut butter. Data from NHANES 1999-2004 showed that comparable percentages of WIC participants and nonparticipants consumed foods from each of the WIC food groups, with the following exceptions:

- WIC participants and income-eligible nonparticipants were equally likely to consume any breakfast cereals, but WIC participants were more likely to consume iron-fortified, low-sugar cereals approved by the WIC program.

- Compared with higher-income nonparticipants, WIC children were more likely to consume eggs and dry beans, and less likely to consume peanut butter.

This study was not designed to estimate the impact of WIC participation on consumption of specific foods. However, if WIC participants and income-eligible nonparticipants have similar food preferences, then the results suggest that WIC participation increases the probability of consuming specific types of cereals.

Major food groups and subgroups

We examined the proportion of WIC participant and nonparticipant children consuming foods from each of the major food groups. These proportions were comparable for five of ten food groups: grains, vegetables, meat and meat alternates, mixed dishes, and salty snacks. The following differences in food choices were observed:

- Compared with income-eligible nonparticipants, WIC participants were more likely to consume fruit, including fruit juice.

- Compared with higher-income nonparticipants, WIC participants were less likely to consume fruit; milk, cheese, and yogurt; sweets; and added fats and oils. WIC participants were more likely to consume sweetened beverages.

At the subgroup level, WIC participants were significantly less likely than one or both groups of nonparticipants to consume whole grains and fresh fruits, which are included in the revised WIC food package. Among 2-4-year-olds, WIC participants were significantly less likely than higher-income nonparticipants to consume reduced fat milk. The revised WIC food package prescribes reduced-fat milk for children over one-year of age, as recommended by the American Academy of Pediatrics.

Nutritional quality of food choices

To summarize the nutritional quality of food choices, we classified foods within food group into three categories: foods to consume frequently, selectively, or occasionally. Foods were grouped into categories based on the Dietary Guidelines and MyPyramid recommendations. Over half of the foods consumed by WIC participants and both groups of nonparticipants were categorized for occasional consumption (top of the radiant pyramid). Differences between groups were statistically significant but small in magnitude.

The relative nutritional quality of WIC participants' food choices differed from both groups of nonparticipants in two food groups: grain and milk/milk products. WIC participants choose more nutritious foods in the grain group (perhaps due to the influence of WIC cereals), but less nutritious choices in the milk group (due to consumption of whole milk products). In three food groups (meats, sweets, and salty snacks), the relative nutritional quality of WIC participants' food choices did not differ significantly from income-eligible nonparticipants, but were less nutritious than those of higher-income nonparticipants.

Chapter 6
The Healthy Eating Index-2005 and Sources of MyPyramid Intakes

In this chapter, we examine the overall quality of the diets consumed by WIC children and nonparticipant children using the Healthy Eating Index (HEI)-2005. The HEI-2005 was developed by the USDA Center for Nutrition Policy and Promotion (CNPP) to measure compliance with the diet-related recommendations of the 2005 *Dietary Guidelines for Americans* (DGA) and the *MyPyramid* food guidance system (Guenther et al., in press).

The *MyPyramid* food guidance system translates the DGA into simple messages about the types and amounts of food to consume in five major food groups (grains, vegetables, fruits, milk, meat and beans), based on energy needs. Subgroup recommendations are provided for grains (consumption of whole grains) and vegetables (by type) to help people understand how they should distribute consumption within these groups. Recommendations are provided for 12 food intake patterns—specific to gender, age, and activity level—based on calorie needs, nutrient goals, nutrient content of foods in each group, and food consumption patterns.

MyPyramid also provides guidance about intakes of oils and discretionary calories (see box). The DGA encourages consumption of oils, within recommended calorie allowances, because they provide essential polyunsaturated fatty acids and other nutrients, such as vitamin E. Moderation of saturated fat and sodium intakes is recommended because excess consumption may contribute to cardiovascular disease and high blood pressure. Consumption of solid fat, alcohol, and added sugar (SoFAAS) should be within discretionary calorie allowances, which reflect the balance of calories remaining in a person's energy allowance after accounting for the calories in the most nutrient-dense (fat-free or lowest fat form, with no added sugars) form of the various foods needed to meet recommended nutrient intakes (Basiotis et al., 2006).

MyPyramid Intakes and the Healthy Eating Index (HEI-2005)

Data

- NHANES 1999-2002: Single 24-hour recall per person
- MyPyramid Equivalents Database for USDA Survey Food Codes, 1994-2002, version 1.0

Measures

- Average HEI-2005 component scores
- Average number of MyPyramid Equivalents per child
- Food sources of MyPyramid intakes

The HEI-2005 contains 12 component scores to measure consumption of food and nutrients relative to MyPyramid recommendations and the DGA (Table 6-1). Eight components are food-based and assess intakes of MyPyramid food groups and subgroups. The four remaining components assess intakes of oils, saturated fat, sodium, and calories from SoFAAS.

This chapter begins with a description of the HEI-2005 component scoring system and comparison of HEI-2005 scores for WIC children and nonpar-

MyPyramid Food Groups

Consume oils for essential fatty acids.
Use discretionary calorie allowance to:

- Eat more foods from any food group,
- Eat foods in non-lean forms,
- Add fat or sweeteners to foods, or
- Consume foods that are mostly fats, caloric sweeteners, or alcohol (such as candy, soda, or alcoholic beverages).

Source: MyPyramid.gov

Table 6-1—Healthy Eating Index-2005 (HEI-2005) Scoring System

Component	Max Score	Criteria for:	
		Zero Score	Maximum Score
1. Total Fruit	5	No intake	≥ 0.8 cup equiv. per 1,000 kcal
2. Whole Fruit	5		≥ 0.4 cup equiv. per 1,000 kcal
3. Total Vegetables	5		≥ 1.1 cup equiv. per 1,000 kcal
4. Dark Green & Orange Vegetables and Legumes	5		≥ 0.4 cup equiv. per 1,000 kcal
5. Total Grains	5		≥ 3.0 oz equiv. per 1,000 kcal
6. Whole Grains	5		≥ 1.5 oz equiv. per 1,000 kcal
7. Milk	10		≥ 1.3 cup equiv. per 1,000 kcal
8. Meat and Beans	10		≥ 2.5 oz equiv. per 1,000 kcal
9. Oils	10		≥ 12 grams per 1,000 kcal
10. Saturated fat[a]	10	≥ 15%	≤ 7% of energy
11. Sodium[a]	10	≥ 2.0 gms	≤ 0.7 grams per 1,000 kcal
12. Calories from SoFAAS	20	≥ 50%	≤ 20% of energy

[a] Saturated Fat and Sodium get a score of 8 for the intake levels that reflect the 2005 Dietary Guidelines, <10% of calories from saturated fat and 1.1 grams of sodium/1,000 kcal, respectively.

Source: Guenther, et al., in press.

ticipant children. Next, we examine HEI components separately to gain insight into the scores. For food-based components, we examine the total amounts of food eaten within each food group relative to recommendations. For both food and nutrient-based components, we present data on the specific foods that contribute to intakes.

Analyses in this chapter are limited to children 2-4-years-old because the DGAs and MyPyramid apply to individuals age 2 and above. The analysis is limited to NHANES 1999-2002 because data on MyPyramid intakes for NHANES 2003-2004 was not available at the time the analyses were completed.

The Healthy Eating Index-2005

The HEI-2005 scoring system measures intakes of food and nutrient groups based on a density approach that compares intakes per 1,000 calories to a reference standard. This reflects the overarching recommendation of the DGA and MyPyramid to meet food group and nutrient needs while maintaining energy balance. Reference standards are based on the assumptions that underlie the recommended MyPyramid eating patterns, properly reflecting goals for intakes over time and the recommended mix of food groups.

Table 6-1 shows the intake criteria corresponding to minimum and maximum HEI scores for each component. The scoring is linear for all components except saturated fat and sodium. Thus, an intake that is halfway between the criteria for the max and min scores, yields a score that is half the maximum score. Saturated fat and sodium are scored on a nonlinear scale, with criteria specified for scores of 0, 8, and 10. A total HEI score, with a range from 0 to 100, is obtained by summing the component scores.

We followed CNPP guidance to apply the HEI scoring system to population groups.[1] As noted by CNPP, it is preferable to calculate HEI scores based on *usual* intakes. When only 1 day of intake is available, an HEI based on usual intakes could be approximated by applying the HEI scoring system to the ratio of a group's mean food (or nutrient) intake to the group's mean energy intake. Additional information about methods used in computing HEI-2005 scores is provided in Appendix A.

[1] Guidance is found at: http://www.cnpp.usda.gov/HealthyEatingIndexSupportFiles.htm.

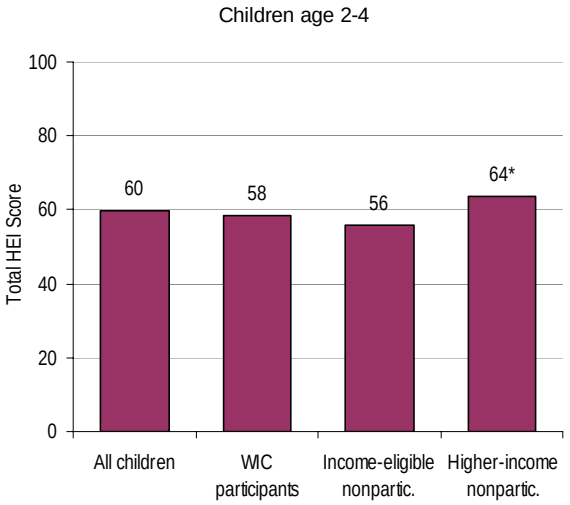
The source data for calculation of HEI-2005 scores is NHANES 1999-2002 Individual Food Files (IFF) and MyPyramid Equivalents Database for USDA Survey Food Codes, developed by USDA's Agricultural Research Service (ARS) (see Appendix A). Both files contain one record for each food item reported by respondents. The NHANES IFF files contain measures of energy and alcohol intake (grams), though the latter was zero for all children in this age group. The MyPyramid database corresponds to the NHANES IFF and contains measures of intakes for MyPyramid groups. Intakes of vegetables, fruits, and milk are measured in cups or cup equivalents; intakes of grains and meat and beans are measured in ounces (oz.) or ounce equivalents; intakes of oils and solid fats are measured in grams (gm); and intakes of added sugars are measured in teaspoons.

HEI-2005 Scores for WIC Children and Nonparticipant Children

Overall, children age 2-4 scored 60 out of a possible 100 points (Figure 6-1). This indicates that the diets of children in all groups fell considerably short of the diet recommended in the DGA and MyPyramid. The overall score for WIC children and income-eligible nonparticipant children was not significantly different. WIC children, however, had an overall score that was significantly below that of higher income nonparticipant children (58 vs. 64 out of a possible 100).

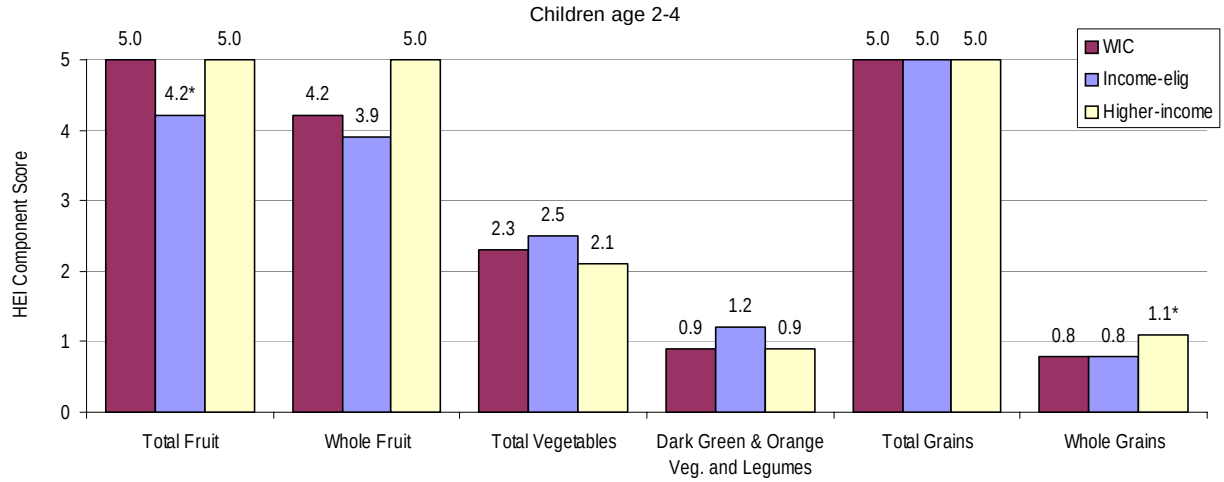
Scores for the HEI-2005 components are shown in Figures 6-2 to 6-4 (and Table C-14). Figure 6-2 shows the 6 food-based components that are worth a maximum score of 5 points each. WIC children had scores that were significantly different from nonparticipant children on only two components (Total Fruit and Whole Grains).

Figure 6-1—Healthy Eating Index-2005: Total Scores



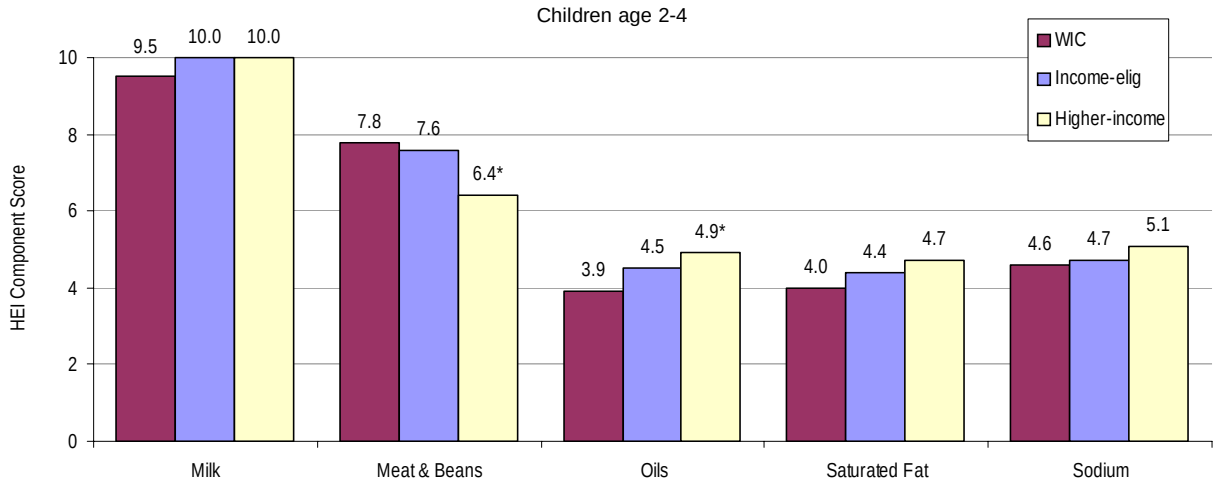
* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Figure 6-2—Food-Based HEI-2005 Components (Maximum Score is 5 Points Each)



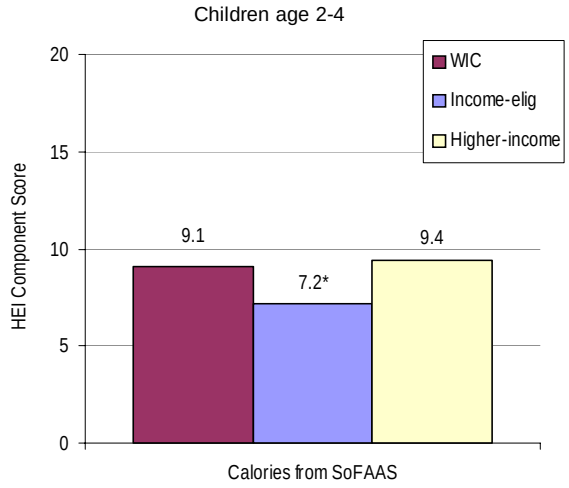
* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Figure 6-3—Food and Nutrient-Based HEI-2005 Components (Maximum Score is 10 Points Each)



* Denotes statistically significant difference from WIC participants at the .05 level or better. Estimates are age adjusted.

Figure 6-4—HEI-2005 Score for Calories from SoFAAS (Maximum Score is 20 Points)



Differences between WIC participants and each group of nonparticipants are not statistically significant. Estimates are age adjusted.

Figure 6-3 shows the 5 food and nutrient-based components that are worth a maximum score of 10-points each. Scores for WIC children and income-eligible nonparticipant children were comparable for all of these components. WIC children scored higher than higher-income nonparticipant children on the Meat and Beans component; WIC children scored lower than higher-income children on the Oils component.

For Calories from SoFAAS (Figure 6-4), WIC children and higher-income nonparticipant children had comparable HEI scores, while WIC children scored higher than income-eligible nonparticipant children.

HEI-2005 Components and Underlying Food and Nutrient Intakes

In this section we discuss each HEI component score separately. To gain insight into factors that contribute to the scores, we first examine the amounts of food eaten in each of the MyPyramid food groups and subgroups considered in the component scores. Then we present data on the specific foods that contribute to these intakes.

The total amounts of food eaten in each MyPyramid food group is presented in Table 6-2. This "food group analysis" differs in two important ways from the food choice analyses presented in Chapter 5. First, this chapter examines the total amounts of food eaten within a food group relative to recommendations; in Chapter 5 we presented the proportion of children who consumed one or more foods within a food group. Second, the analyses in this chapter are based at the component or ingredient level. Thus, a single food may contribute to multiple pyramid groups. For example, pizza contributes to intakes in the grain

Table 6-2—Average Amounts of MyPyramid Groups Consumed Per Child

	All Children	WIC Children	Income-eligible Nonparticipant Children	Higher-income Nonparticipant Children
Sample size	1,212	423	369	351
Total Fruit (cup equiv.)	1.38	1.50	***1.10	1.48
Whole fruit	0.61	0.55	0.51	*0.72
Total Vegetable (cup equiv.)	0.81	0.80	0.89	0.73
Dark green and orange vegetables, and legumes[1]	0.12	0.11	0.15	0.11
Other vegetables	0.70	0.72	0.75	0.62
Total Grain (ounce equiv.)	5.07	5.16	5.09	4.97
Whole grain ounce equiv.	0.44	0.38	0.39	*0.50
Non-whole grain ounce equiv.	4.63	4.78	4.70	4.46
Total Milk group (cup equiv.)	2.20	2.00	2.15	**2.33
Milk cup equiv.	1.74	1.61	1.72	1.85
Yogurt cup equiv.	0.06	0.00	0.00 u	**0.08
Cheese cup equiv.	0.39	0.36	0.38	0.40
Total Meat and Bean (ounce equiv.)	2.79	3.05	3.04	**2.38
Total lean meat from meat, poultry, fish	2.21	2.51	2.52	***1.79
Total lean meat from meat alternates	0.57	0.54	0.52	0.59
Oils (grams)	8.91	7.75	*9.16	9.21
Discretionary solid fats and added sugars				
Solid fats (grams)	39.18	40.90	41.32	*36.33
Added sugars (teaspoon equiv.)	15.39	13.86	*17.69	14.65

Note: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to children "Currently receiving WIC benefits."

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 Legumes count as meat until a persons meat intake reaches 2.5 ounce equivalents per 1000 kcal, then legumes count as vegetables (per specifications of Healthy Eating Index-2005).

Sources: NHANES 1999-2002 dietary recalls and MyPyramid Equivalents Database for USDA Survey Food Codes, 1994-2002, Version 1.0, October 2006. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

(crust), vegetable (tomato sauce and any vegetable toppings), milk (cheese), and meat and bean (meat toppings, if any) groups. Similarly, fruits canned in heavy syrup are broken down into fruit and added sugars; and cookies, cakes, and pies are broken down into grains, oils and/or solid fats, added sugars, and, where appropriate, fruit.

For each of the HEI-2005 components (both food-based components and nutrient-based components), we present data on the specific foods that contribute to children's intakes ("food sources of intakes") (Tables 6-3 to 6-12). For each group of children (defined by WIC participation status), we ask the question: "Which specific foods contributed most to consumption in this food group?" For these analyses, we revert back to the food grouping scheme used in Chapter 5 so that the focus is on foods as they were eaten. For example, hamburgers or cheeseburgers that included lettuce and tomatoes may show up as contributors to vegetable intakes; pizza, cheeseburgers, and other mixed dishes that contain cheese may show up as contributors to intakes of milk and milk products.

Results of the "food sources" analyses are presented in tables that list all foods that provided two percent or more of total intake for any group (all children, WIC children, income-eligible nonparticipant children, and higher-income nonparticipant children). Foods are listed in rank order, from largest contributor to smallest contributor, based on results for all children. In discussing results, we focus on significant differences that involved foods that were among the top five contributors to total intakes.

Total Fruit and Whole Fruit

For the Total Fruit component of the HEI-2005, WIC children and higher-income nonparticipant children had comparable scores, but WIC children had a significantly higher score than income-eligible nonparticipant children (5.0 vs. 4.2 out of 5) (Figure 6-2). For the Whole Fruit component, there was no significant difference between WIC children and either group of nonparticipant children.

WIC children consumed significantly more Total Fruit (which includes 100% juice) than income-eligible nonparticipant children (1.5 cup equivalents vs. 1.1) (Table 6-2). Table 6-3 shows that 100% juices accounted for 50 percent of fruit intakes for children age 2-4. WIC children obtained a significantly greater share of their fruit intake from juice compared with both income-eligible and higher-income nonparticipant children (60 percent vs. 46 and 45 percent). In addition, this table shows that fresh berries, fresh oranges, and whole fruit from all other sources made significantly smaller contributions to total fruit intakes of WIC children, compared to higher-income nonparticipant children.

Total Vegetables and Dark Green and Orange Vegetables and Legumes

There were no significant differences between WIC children and either group of nonparticipant children on HEI-2005 component scores for Total Vegetables or for Dark Green and Orange Veg-

Table 6-3—Food Sources of Pyramid Food Group Intakes: Fruit

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Non-citrus juice	31.6	35.8	** 24.1	31.1
2. Citrus juice	18.0	24.0	21.8	* 13.7
3. Fresh apple	13.7	12.7	12.9	15.8
4. Fresh banana	8.5	8.5	10.5	7.9
5. Sweetened beverage	5.4	3.4	** 7.6	5.2
6. Fresh watermelon	3.1	2.1	3.7 u	3.5
7. Fresh grapes	3.0	2.3	2.1	3.4
8. Fresh berries	2.4	0.7 u	0.0 u	** 4.7
9. Fresh orange	1.6	2.1	3.2	** 0.5 u
All other food groups	12.7	8.5	13.6	* 14.2

Notes: Table shows the percent of MyPyramid equivalents contributed by each food source for each group of children. Food sources are ranked by their contribution to overall ('All children') intake. Sources shown separately contributed at least 2 percent to the Pyramid intake of any group. Food sources are defined as individual foods reported by respondents, except foods reported to be eaten in 'combination' as sandwiches, green salads, and soup were combined and identified as the combination item.

Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

Sources: NHANES 1999-2002 dietary recalls and MyPyramid Equivalents Database. Includes children 2-4 years old (MyPyramid data does not include one-year-olds). Estimates are based on a single dietary recall per person. 'All Children' includes those with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

etables and Legumes (Figure 6-2). Scores for the Total Vegetables component were about 2 (out of 5) for all three groups. The proportions of children who consumed Dark Green and Orange Vegetables and Legumes were so low that this score was only 1 out of 5 for all three groups.

On average, WIC children and both groups of nonparticipant children consumed less than a cup of vegetables on the intake day (Table 6-2). The leading contributors to vegetable intakes were fried potatoes, potato chips, and other types of cooked potatoes (Table 6-4). Together, these foods accounted for 32 percent of total vegetable intake. This was true for WIC children and both groups of nonparticipant children, although there were some (not significant) differences in relative rankings. Relative to higher-income children, WIC children obtained significantly smaller shares of their total vegetables intake from raw carrots, catsup, cooked broccoli, and pizza (no meat); and larger shares of their total vegetable intake from vegetable mixtures (including soup) and meat soups.

Total Grains and Whole Grains

WIC children and both groups of nonparticipant children scored the maximum 5 points for the HEI-2005 Total Grains component (Figure 6-2). Scores for Whole Grains were much lower, averaging about 1 (out of 5); WIC children had a significantly lower score for the Whole Grains component compared with higher-income children (0.8 vs. 1.1).

All three groups of children consumed about 5 ounce equivalents of grains and grain products on

Table 6-4—Food Sources of Pyramid Food Group Intakes: Vegetables

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Cooked potatoes-fried	14.1	13.0	14.4	14.9
2. Potato chips	9.0	8.2	10.7	8.6
3. Cooked potatoes-not fried	8.4	9.7	8.3	7.0
4. Cooked corn	7.6	8.5	7.8	6.9
5. Pasta dishes, italian style	6.1	6.4	4.3	6.7
6. Raw carrots	3.4	1.2 u	3.5	* 5.8
7. Cooked green beans	3.2	2.8	3.2 u	3.0
8. Salad (greens)	3.0	3.1	2.9 u	2.8
9. Meat mixtures w/ red meat	2.9	2.5	2.1 u	3.6 u
10. Vegetables mixtures (inc soup)	2.6	4.9	2.7	* 1.4 u
11. Catsup, mustard, relish, etc	2.5	1.5	2.0	** 3.6
12. Pizza w/ meat	2.3	2.3	2.3	2.1
13. Cooked broccoli	2.4	1.0 u	2.6 u	* 3.5
14. Cooked mixed	2.3	3.1 u	3.1 u	1.5
15. Meat soup	2.2	4.2	* 1.5 u	* 0.9 u
16. Pizza (no meat)	2.0	0.6 u	1.1	** 3.2
17. Tomato sauce and meat (no pasta)	1.8	1.1 u	1.7 u	2.0 u
18. Hamburgers/cheeseburgers	1.6	2.5	1.1	1.6
19. Rice dishes	1.5	2.4	1.7	0.9
20. Grain soups	1.5	1.2	2.0 u	1.2 u
21. Cooked carrots	1.4	0.8	2.4 u	1.0 u
22. Meat mixtures w/ chicken/turkey	1.2	2.4 u	1.4 u	0.0 u
23. Beans	1.1	1.0 u	2.0 u	0.0 u
All other food groups	16.1	15.4	15.1	17.2

See notes on table 6-3.

the intake day (Table 6-2). Consumption of whole grains was low (one-half oz. or less) for all groups. WIC participants consumed fewer whole grain equivalents than higher-income nonparticipants, but this difference was not significant when examined on a per 1,000 kcal basis for the HEI score.

The top five contributors to grain intakes were sandwiches other than hamburgers and cheeseburgers, cold cereals, bread that was not consumed as part of a sandwich, cookies, and crackers (Table 6-5). Differences between WIC children and nonparticipant children in the relative importance of specific sources of grain were generally not statistically significant. Compared with higher-income nonparticipants, however, WIC participants obtained significantly less of their total grains intake from pizza (without meat) (0.8 vs. 4.0 percent), and significantly more of their total grains intake from corn tortillas (2 percent vs. zero).

Milk and milk products

Mean scores for the HEI-2005 Milk component were at or near the maximum score of 10 for all three groups of children, with no statistically significant differences between groups (Figure 6-3). WIC children and higher-income nonparticipant children had comparable intakes of milk and cheese, but higher-income nonparticipant children consumed more yogurt than WIC children (0 cups vs. 0.8 cups, on average) (Table 6-2).

For all children, the top two contributors to intakes of milk and milk products were whole unflavored milk and 2% unflavored milk; together, these milks accounted for 56 percent of children's intake of milk and milk products (Table 6-6). However, WIC children obtained significantly

Table 6-5—Food Sources of Pyramid Food Group Intakes: Grains

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Sandwiches (excl. burgers)	13.0	11.6	14.1	13.2
2. Cold cereal	8.7	9.5	8.9	7.8
3. Bread	6.9	6.5	8.1	6.8
4. Cookies	6.3	6.1	6.4	6.0
5. Crackers	6.0	5.0	4.7	7.2
6. Popcorn	3.6	3.5 u	1.2 u	5.2
7. Corn-based salty snacks	3.6	4.0	3.1	3.2
8. Macaroni & cheese	3.5	2.9	4.0	3.8
9. Pizza w/ meat	3.4	3.6	4.1	2.8
10. Pasta dishes, italian style	3.4	3.5	3.0	3.1
11. Hamburgers/cheeseburgers	3.4	4.8	2.5	3.2
12. Rice	3.2	4.6	2.9	2.3
13. Pasta	3.1	3.2	2.7	3.6
14. Pancakes, waffles, french toast	3.1	2.7	1.6	4.6
15. Pizza (no meat)	2.8	0.8	2.1	** 4.0
16. Hot cereal	2.4	2.5	3.0	2.1
17. Chicken	2.0	1.6	2.4	2.2
18. Cake/cupcakes	1.6	1.6	2.0	1.3
19. Flour tortillas	1.3	1.6	2.4	0.6 u
20. Corn tortillas	1.0	2.0	*** 0.7	*** 0.0 u
All other food groups	17.8	18.5	20.1	16.6

See notes on table 6-3.

Table 6-6—Food Sources of Pyramid Food Group Intakes: Milk and Milk Products

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Unflavored whole milk	33.0	43.8	* 34.8	*** 26.5
2. Unflavored 2% milk	23.0	12.8	** 24.3	*** 27.6
3. Cheese	7.1	7.7	6.0	7.1
4. Flavored whole milk	5.6	11.5	6.5	** 2.2
5. Unflavored 1% milk	4.7	1.8 u	3.6 u	** 6.7
6. Unflavored skim milk	2.9	1.2	2.7 u	3.9
7. Sandwiches (excl. burgers)	2.9	3.2	3.3	2.7
8. Yogurt	2.7	1.5	2.0 u	* 3.4
9. Macaroni & cheese	2.1	2.0	2.2	2.2
10. Ice cream	2.0	1.3	1.8	2.5
11. Pizza w/ meat	1.8	2.0	2.2	1.4
12. Flavored 2% milk	1.7	0.7 u	1.7 u	2.2 u
13. Pizza (no meat)	1.6	0.0 u	1.1	** 2.3
All other food groups	8.8	9.8	7.9	9.2

See notes on table 6-3.

more of their total milk intake from whole unflavored milk than either income-eligible or higher-income nonparticipant children (44 percent vs. 35 and 27 percent) and significantly less from 2% milk (13 percent vs. 24 and 28 percent). In addition, flavored whole milk was a significantly greater source of milk for WIC children (12 percent and 3rd leading source) than for higher-income children (2 percent and 10th leading source) and WIC children obtained less of their milk intakes from 1% milk, yogurt, and meatless pizza than higher-income nonparticipant children.

Meat and Beans

Mean scores for the HEI-2005 Meat and Beans component were comparable for WIC children and income-eligible nonparticipant children (8 out of 10) (Figure 6-3). However, WIC children had a significantly higher mean score on this component than higher-income nonparticipant children (7.8 vs. 6.4). WIC children had significantly higher mean intakes of meats (including poultry and fish) compared with higher-income nonparticipant children, while the two groups had comparable intakes of meat alternates (eggs, soy products, legumes, and nuts and nut butters, and seeds) (Table 6-2).

The top two sources of meat and bean intakes for all three groups of children were chicken and sandwiches other than hamburgers and cheeseburgers (Table 6-7). However, WIC children obtained significantly less of their total meat and bean intake from sandwiches, compared with higher-income nonparticipant children (13 vs. 20 percent).

Compared with higher-income nonparticipant children, WIC children obtained significantly more of their meat and bean intake from eggs, meat mixtures with chicken/turkey, and legume. Compared with income-eligible nonparticipant children, WIC children obtained significantly more of their meat and bean intake from bacon and sausage (3.3 vs. 1.5 percent).

Oils

There were no significant differences between WIC children and income-eligible nonparticipant children in mean scores for the HEI-2005 Oils

Table 6-7—Food Sources of Pyramid Food Group Intakes: Meat and Beans

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Chicken	18.6	17.1	20.0	20.2
2. Sandwiches (excl. burgers)	16.1	12.7	14.7	* 19.5
3. Eggs	8.1	10.3	8.1	** 6.1
4. Hot dogs	7.7	6.1	9.3	6.5
5. Beef	7.2	8.7	8.3	5.5
6. Hamburgers/cheeseburgers	5.4	7.2	3.6	5.7
7. Fish	3.8	2.5 u	4.8	4.8
8. Meat mixtures w/ red meat	3.0	3.1	2.8	3.3
9. Cold cuts	2.6	3.3	1.4	3.2
10. Ground beef	2.3	1.6	4.9 u	1.2 u
11. Bacon/sausage	2.2	3.3	* 1.5	1.9 u
12. Pork	2.1	2.1	2.8	1.3 u
13. Pasta dishes, italian style	2.0	2.6	1.7	1.7
14. Meat mixtures w/ chicken/turkey	1.6	2.4	2.3	** 0.0 u
15. Nuts	1.5 u	0.0 u	1.0 u	2.9 u
16. Meat mixtures w/ fish	1.0	2.4 u	0.5 u	0.9 u
17. Beans	0.9	2.0	0.7	* 0.0 u
All other food groups	14.0	12.5	11.6	14.7

See notes on table 6-3.

component (3.9 and 4.5 out of a possible 10).[2] WIC children, however, had a significantly lower score on the Oils component compared with higher-income nonparticipant children (3.9 vs. 4.9) (Figure 6-3).

The leading sources of oils in the diets of all children were sandwiches other than hamburgers and cheeseburgers (this is likely mayonnaise and other dressing-style sandwich spreads), potato chips, other salty snacks, and chicken (fried or otherwise prepared with oil) (Table 6-8). WIC children obtained significantly smaller shares of their total oil intake from sandwiches and nuts than higher-income nonparticipant children.

[2] Income-eligible nonparticipant children consumed more discretionary oils, on average, than WIC children (Table 6-2), but this difference did not bring income-eligible nonparticipant children, as a group, significantly closer to the gm-per-1,000 calorie standard used in scoring the HEI-2005.

Saturated Fat

WIC children and nonparticipant children had scores on the HEI-2005 component for Saturated Fat ranging from 4.0 to 4.7, out of a possible 10. There were no statistically significant differences in scores between groups (Figure 6-3).

Leading contributors to children's saturated fat intakes included whole milk, sandwiches other than hamburgers and cheeseburgers (which may have contained cheese), 2% milk, and cheese (Table 6-9). WIC children obtained significantly less of their saturated fat from 2% milk than either income-eligible or higher-income nonparticipant children (as noted in Chapter 5, WIC children were more likely to consume whole milk than 2% or other reduced-fat milks). In addition, WIC children obtained more of their saturated fat from whole milk (flavored and unflavored) and eggs (prepared) than higher-income nonparticipant children, and less of their saturated fat from crackers.

Table 6-8—Food Sources of Pyramid Intakes: Oils

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Sandwiches (excl. burgers)	16.5	11.6	13.5	* 21.6
2. Potato chips	14.9	15.8	19.1	12.1
3. Corn-based salty snacks	13.4	17.9	12.6	10.2
4. Chicken	12.5	10.4	13.7	14.5
5. Margarine	4.6	5.2	3.2	5.9
6. Salad (greens)	3.4	4.2 u	4.6 u	2.3 u
7. Peanut/almond butter	2.6 u	1.3 u	0.5 u	2.3
8. Nuts	2.2	0.0 u	1.8 u	* 3.3 u
9. Cooked potatoes-fried	2.4	4.5 u	3.6	0.0 u
10. Candy	2.2	3.2	2.4 u	2.0
11. Grain soups	2.1	2.4	2.4	1.1 u
12. Salad dressing	1.7	0.9 u	1.5 u	2.1 u
All other food groups	21.4	22.3	21.1	22.2

See notes on table 6-3.

Table 6-9—Food Sources of Pyramid Intakes: Saturated Fat

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Whole white milk	16.4	19.5	16.0	* 14.6
2. Sandwiches (excl. burgers)	8.5	7.8	8.7	8.7
3. 2% white milk	7.2	3.5	*** 7.1	*** 9.9
4. Cheese	5.8	5.8	4.3	6.3
5. Ice cream	4.0	3.0	4.3	4.5
6. Hot dogs	3.7	2.8	5.1	3.0
7. Chicken	3.1	2.8	3.7	3.1
8. Cooked potatoes-fried	3.0	2.6	3.4	3.1
9. Whole flavored milk	3.0	5.4	3.1	** 1.4
10. Hamburgers/cheeseburgers	2.8	3.8	2.2	2.7
11. Macaroni & cheese	2.6	2.0	2.4	3.4
12. Cookies	2.5	2.8	2.4	2.3
13. Eggs	2.3	3.1	2.4	** 1.6
14. Potato chips	2.0	1.8	2.6	1.7
15. Pizza w/ meat	1.9	1.9	2.2	1.6
16. Crackers	1.5	1.0	1.1	** 2.1
17. Candy	1.5	1.2	1.0	2.1
All other food groups	28.4	29.2	27.9	28.0

See notes on table 6-3.

Sodium

There were no significant differences between WIC children and either group of nonparticipant children on scores for the HEI-2005 Sodium component (Figure 6-3). Scores for all three groups averaged about 5 out of a possible 10.

The leading sources of sodium in children's diets were sandwiches other than hamburgers and cheeseburgers, ready-to-eat breakfast cereals, pasta-based mixed dishes (Table 6-10). WIC children obtained significantly less of their total sodium intakes from 2% milk, crackers, catsup and other condiments, and meatless pizza than one or both groups of nonparticipant children, and significantly more sodium from eggs (prepared).

Calories from Solid Fats and Added Sugars

Overall, children age 2 to 4 had an average score of about 9 (out of a possible 20) on the Calories from SoFAAS component of the HEI-2005, which assesses the percentage of total calorie intake contributed by solid fats, alcoholic beverages, and added sugars (alcoholic beverages were not consumed by this age group) (Figure 6-4). As noted in Chapter 3, on average, children in this age group obtained 36 percent of their total energy from SoFAAS (Table C-1).

WIC children and higher-income nonparticipant children had comparable scores on the HEI-2005 SoFAAS component (about 9 out of a possible 20). WIC children had a significantly higher score than income-eligible nonparticipant children (9.1 vs. 7.2).

There were significant differences between groups in the absolute intakes of these nutrients. WIC children consumed more solid fat than higher-income nonparticipant children (41 gm vs. 36) and

Table 6-10—Food Sources of Pyramid Intakes: Sodium

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Sandwiches (excl. burgers)	11.2	10.5	11.9	11.3
2. Cold cereal	5.1	5.3	5.1	4.8
3. Pasta dishes, italian style	4.5	4.4	3.5	4.8
4. Hot dogs	3.8	3.2	5.2	2.9
5. Chicken	3.5	2.9	3.5	4.3
6. Whole white milk	3.3	3.9	3.2	3.0
7. Cheese	2.9	3.0	2.1	3.1
8. Grain soups	2.7	2.8	3.0	2.4 u
9. Macaroni & cheese	2.7	2.2	2.8	3.2
10. Crackers	2.6	2.0	2.0	* 3.4
11. Hamburgers/cheeseburgers	2.4	3.4	1.8	2.3
12. 2% white milk	2.3	1.1	*** 2.3	*** 3.3
13. Pizza w/ meat	2.2	2.2	2.6	1.9
14. Popcorn	2.1	1.9 u	0.7 u	3.2
15. Bread	2.1	2.0	2.4	2.0
16. Catsup, mustard, relish, etc	2.0	1.3	1.5	** 2.8
17. Eggs	1.8	2.7	2.0	** 1.2
18. Cooked potatoes-fried	1.7	1.4	1.8	1.9
19. Rice	1.6	2.4	1.5	1.1
20. Pancakes, waffles, french toast	1.6	1.3	0.8 u	2.5
21. Pizza (no meat)	1.5	0.0 u	1.1	** 2.3
All other food groups	36.3	39.8	39.2	** 32.3

See notes on table 6-3.

less added sugar than income-eligible nonparticipants (14 tsp. vs. 18) (Table 6-2).

The leading sources of discretionary solid fat, across all children, were whole white milk, sandwiches other than hamburgers and cheeseburgers, fried potatoes, and 2% milk (Table 6-11). Together, these four items accounted for just over 30 percent of discretionary solid fat intakes. No other single food/group accounted for more than 5 percent of discretionary solid fat (measured over all children). There were some minor variations across WIC participation groups in the leading sources of discretionary solid fat. WIC children obtained significantly more of their discretionary solid fat from flavored whole milk and eggs (prepared) and significantly less from 2% milk and crackers.

Noncarbonated sweetened drinks and regular (not diet) sodas were the leading sources of added sugars for all groups of children, contributing 35 percent of all added sugars (Table 6-12). Noncarbonated sweetened drinks contributed less to the added sugar intake of WIC children, compared with income-eligible nonparticipant children (18 vs. 27 percent). On the other hand, WIC children obtained more added sugar from regular sodas than higher-income nonparticipant children (20 vs. 12 percent).

Other food sources that contributed significantly different percents of added sugar across groups included candy, yogurt, and sweetened teas (contributed less for WIC participants) and whole flavored milk (contributed more for WIC participants)

Summary

In this chapter, we used data from NHANES 1999-2002 (4 years) and the MyPyramid database to examine HEI-2005 scores and food sources of pyramid intakes for WIC children and nonparticipant children age 2-4.

Total HEI-2005 scores indicate that the diets consumed by all groups of children were not consistent with DGA and MyPyramid recommendations. HEI scores on Dark Green and Orange Vegetables and Legumes, and Whole Grains were the most in need of improvement. Scores on Whole Fruit and Total Vegetables are also a concern, especially for WIC children and income-eligible nonparticipant children. In addition, children's intakes of saturated fat, sodium, and calories from SoFAAS were high.

There were few significant differences in the HEI-2005 component scores of WIC children and income-eligible children:

- Compared with income-eligible nonparticipant children, WIC children had a significantly higher HEI-2005 score for Total Fruit and Calories from SoFAAS.

- Compared with higher-income nonparticipant children, WIC children had a significantly lower HEI-2005 score for Whole Grains and Oils.

Analyses of data on food sources of MyPyramid intakes show that WIC participants and nonparticipant children obtained:

- Less than 10% of total grain intakes from whole grains
- Almost one-third of total vegetable intakes from white potatoes
- Almost 40% of added sugar from sweetened beverages (noncarbonated sweetened drinks, regular sodas, and tea)

In addition, WIC participant children obtained:

- Almost 60% of total fruit intakes from fruit juice (nonparticipants obtained about 45 percent of fruit intakes from juice)
- 55% of milk from whole milk (white or flavored) (compared with 41 poercent and 29 percent for income-eligible and higher-income nonparticipants, respectively)
- 17% of discretionary solid fat from whole milk (compared with 14 percent for nonparticipant children)

Table 6-11—Food Sources of Pyramid Intakes: Discretionary Solid Fats

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Whole white milk	14.6	17.1	14.2	13.3
2. Sandwiches (excl. burgers)	7.3	7.0	7.9	7.0
3. 2% white milk	6.0	2.8	** 5.8	*** 8.4
4. Cooked potatoes-fried	5.6	4.5	6.3	6.0
5. Cookies	5.0	5.3	4.9	4.8
6. Cheese	5.0	4.9	3.7	5.5
7. Hot dogs	4.2	3.3	5.9	3.3
8. Macaroni & cheese	3.8	3.0	4.0	4.4
9. Crackers	3.6	2.6	2.7	* 4.8
10. Ice cream	3.4	2.4	3.6	4.0
11. Whole flavored milk	2.6	4.6	2.8	** 1.2
12. Eggs	2.5	3.4	2.7	** 1.8
13. Hamburgers/cheeseburgers	2.3	3.2	1.8	2.2
14. Pizza w/ meat	2.3	2.3	2.7	2.0
15. Cake/cupcakes	1.8	1.8	2.0	1.7
16. Chicken	1.6	1.7	2.2	1.1
17. Bacon/sausage	1.5	2.3	* 1.1	* 1.2
18. Pizza (no meat)	1.3	0.0 u	0.9	** 2.0
19. Doughnuts	1.2	2.1 u	1.4	0.7
20. Pancakes, waffles, french toast	1.1	0.0 u	0.0 u	** 2.0
All other food groups	23.3	24.9	23.3	22.7

See notes on table 6-3.

Table 6-12—Food Sources of Pyramid Intakes: Added Sugars

	Total Children	Currently receiving WIC	Income-eligible Nonpartic.	Higher-income Nonpartic.
	Percent of pyramid intake			
Sample size	1,212	423	369	351
1. Noncarbonated sweetened beverage	22.5	18.4	* 26.8	20.2
2. Regular soda	14.8	19.8	14.8	* 12.3
3. Cold cereal	7.4	7.7	7.5	6.9
4. Candy	7.2	5.1	5.2	*** 9.4
5. Cookies	5.5	6.2	5.3	5.3
6. Cake/cupcakes	4.4	5.4	4.8	4.0
7. Syrups/sweet toppings	4.0	3.8	3.3	5.1
8. Ice/popsicles	4.0	2.0	6.1 u	3.8 u
9. Ice cream	3.7	3.1	3.6	4.2
10. Whole flavored milk	3.5	6.8	* 3.3	** 2.0
11. Yogurt	2.7	1.9	1.3	* 4.0
12. Sandwiches (excl. burgers)	2.4	1.9	2.1	* 3.1
13. Tea	1.7	1.4	* 3.3	0.5 u
All other food groups	16.2	16.5	12.5	19.2

See notes on table 6-3.

Chapter 7
Conclusion

This report uses the most recently available data from the National Health and Nutrition Examination Survey (NHANES 1999-2004) to provide an up-to-date and comprehensive picture of the diets of WIC participant children—the largest segment of the WIC population— prior to the revision of WIC food packages.[1] The report examines the nutrient intakes and food choices of WIC participant children and two groups of nonparticipants—those who were income-eligible for WIC but did not participate in the program, and higher-income children who were not eligible for the program. This research was not designed to assess the impact of WIC or in any way attribute differences observed between WIC participants and nonparticipants to an effect of the program. Data on nonparticipants are presented strictly to provide context for data on WIC participants.

Key findings from these analyses, and their implications, are presented in this chapter.

Key Findings

The main results from the preceding chapters are presented here by topic.

Intakes of vitamins and minerals

- The usual diets of U.S. children ages 1 to 4 provide adequate amounts of essential vitamins and minerals.[2] This is true for WIC participants and for both income-eligible and higher-income nonparticipants.

- One quarter of 1-year-olds and roughly 45 percent of 2- to 4-year-olds received one or more dietary supplements during the month preceding their NHANES interview. With the exception of 4-year-olds, the use of supplements was less common among WIC participants than higher-income nonparticipants.

- Sodium intakes were of concern for all children. Eighty-seven percent of WIC participants had usual daily sodium intakes that exceeded the maximum intake considered to be safe for long-term consumption. Similar results were found for both income-eligible and higher-income nonparticipants.

Prevalence of overweight and risk of overweight

- Among WIC participants and both groups of nonparticipants, at least 20 percent of children 2 to 4 years of age were overweight or at risk of overweight. This indicates that some children in each group are consuming more calories than they need on a regular basis.

- Distributions of BMI-for-age were comparable for WIC children and higher-income nonparticipant children. In comparison with income-eligible children, however, WIC children were less likely to be overweight (9 percent vs. 14 percent). The prevalence of overweight was most severe (20 percent) among four-year-old income-eligible nonparticipant children.

Sources of food energy (calories)

- Children's intakes of energy from carbohydrate and protein were generally within acceptable ranges. However, over 25 percent of children age 1-3 years had usual intakes of total fat below the AMDR, whereas 20 percent of 4-year-olds had usual intakes of total fat above the AMDR. The DRIs recommend a decrease in intake of total fat as children age—the AMDRs change from 30-40 percent of energy for 1-3-year-olds, to 25-35 percent of calories for 4-year-olds. Mean intake of total fat as a percent of energy was fairly consistent across ages, and did not show a decrease in total fat intakes at age 4, as recommended by the DRIs.

- WIC children and both groups of nonparticipant children obtained too many calories from saturated fat and consumed too many calories from

[1] NHANES samples of pregnant and breastfeeding women are too small to provide statistically reliable estimates for subgroups of WIC participants and nonparticipants.

[2] Firm conclusions cannot be drawn about the adequacy of usual intakes of potassium, sodium, and dietary fiber because EARs have not been established.

solid fat and added sugar. Overall, only 14 percent of children ages 2 to 4 had usual daily intakes of saturated fat that met the DGA standard. Moreover, children obtained an average of 37 percent of their 24-hour energy intakes from SoFAAS—more than twice the amount of discretionary calories recommended in the MyPyramid food guidance system. WIC children obtained a significantly smaller proportion of energy from SoFAAS than income-eligible nonparticipant children (36 percent vs. 39 percent).

Nutrient density

- Overall, WIC participants' diets were higher in nutrient density (as demonstrated by a significantly higher mean NR score) than the diets of income-eligible nonparticipants (105 vs. 100). This difference was largely attributable to differences in the nutrient density of foods consumed at lunch and dinner.

Meal and snack patterns

- The majority (84 percent) of children ages 1 to 4 consumed three meals on the day the 24-hour recall data were collected and, on average, children consumed three snacks.

- Overall, there were no significant differences between WIC children and income-eligible nonparticipant children in patterns of meal and snack consumption. In comparison with higher-income nonparticipant children, however, WIC children were less likely to consume three meals (80 percent vs. 88 percent). This difference was concentrated among 1- and 2-year-old children. Among 2-year-old children, WIC participants were also less likely than income-eligible nonparticipants to consume three meals (75 percent vs. 89 percent). These differences were attributable to differences in the percentage of children who consumed lunch and dinner meals.

Consumption of WIC foods

- Comparable percentages of WIC participants and nonparticipants consumed foods from each of the WIC food groups, with the following exceptions:

  - WIC participants and income-eligible nonparticipants were equally likely to consume breakfast cereals, but WIC participants were more likely to consume iron-fortified, low-sugar cereals approved by the WIC program.

  - Compared with higher-income nonparticipants, WIC children were more likely to consume eggs and dry beans, and less likely to consume peanut butter.

- WIC participants were significantly less likely than one or both groups of nonparticipants to consume whole grains and fresh fruits, which are included in the revised WIC food package.

- Among 2-4-year-olds, WIC participants were significantly less likely than higher-income nonparticipants to consume reduced fat milk. The revised WIC food package prescribes reduced-fat milk for children over one-year of age, as recommended by the American Academy of Pediatrics.

Consumption of foods from major food groups

- Compared with income-eligible nonparticipants, WIC participants were more likely to consume fruit, due to a higher percentage of WIC children consuming fruit juice.

- Compared with higher-income nonparticipants, WIC participants were less likely to consume fruit; milk, cheese, and yogurt; sweets; and added fats and oils. WIC participants were more likely to consume sweetened beverages..

Nutritional quality of food choices

- To summarize the nutritional quality of food choices, we classified foods into three categories corresponding to foods suggested for frequent, selective, or occasional consumption based on the Dietary Guidelines and MyPyramid recommendations. Over half of the foods consumed by WIC participants and both groups of nonparticipants were categorized for occasional consumption. Differences between groups were significant but small in magnitude.

- The relative nutritional quality of WIC participants' food choices differed from both groups of nonparticipants in two food groups: (1) grains and (2) milk, cheese, yogurt. WIC participants

choose more nutritious foods in the grain group (perhaps due to the influence of WIC cereals), but less nutritious choices in the milk group (due to consumption of whole milk products).

- In three food groups (meats, sweets, and salty snacks), the relative nutritional quality of WIC participants' food choices did not differ significantly from income-eligible nonparticipants, but were less nutritious than those of higher-income nonparticipants

The Healthy Eating Index-2005 (HEI-2005) and sources of Pyramid group intakes

The HEI-2005 consists of 12 component scores designed to measure compliance with the Dietary Guidelines for Americans and MyPyramid food guidance system.

Total HEI-2005 scores for children age 2-4 were about 60 out of a possible 100 points. This indicates that the diets of children in all groups fell considerably short of the diet recommended in the DGA and MyPyramid. The overall score for WIC children was comparable to income-eligible nonparticipant children and significantly below that of higher-income nonparticipant children (58 vs. 56 and 64).

There were few significant differences in the HEI-2005 component scores of WIC children and income-eligible children:

- Compared with income-eligible nonparticipant children, WIC children had a significantly higher HEI-2005 score for Total Fruit (due to higher intake of 100% fruit juice) and Calories from SoFAAS.

- Compared with higher-income nonparticipant children, WIC children had a significantly lower HEI-2005 score for Whole Grains and Oils.

Analyses of data on the food sources of pyramid intakes showed that WIC participant children obtained:

a) Less than 10% of grains from whole grains
b) Almost 50% of vegetables from white potatoes
c) Almost 60% of fruit from fruit juice
d) 55% of milk from whole milk (white or flavored) and 17% from reduced fat milk
e) 14% of discretionary fat from whole milk
f) Almost 40% of added sugar from sweetened beverages (including soft drinks)

Differences between WIC children and nonparticipant children were observed on only 4 of the 12 scores.

Implications for WIC Nutrition Education

A primary conclusion from these analyses is that the diets of children who participate in the WIC program were generally comparable to the diets of children who do not participate in the program. Where differences were observed, they tended to favor children who participated in WIC, relative to income-eligible children who did not participate in the program. For example, income-eligible nonparticipants were more likely to be overweight than WIC children and WIC children obtained a significantly smaller percentage of their total energy intake from SoFAAS.

This does not mean that there is no need for improvement in the diets of WIC participants. Rather, it means that the improvements needed in the diets of WIC children are largely comparable to those needed in the diets of other children ages 1 to 4. Observations that may be of particular interest to WIC nutrition educators include the following:

First, despite the fact that the prevalence of adequate usual intakes was very high, one quarter to almost half of children received one or more dietary supplements. Data from the 2002 FITS study (Briefel et al., 2006) suggest that there may be reason to be concerned about this behavior. Use of dietary supplements may increase children's risk of adverse health outcomes associated with excessive nutrient intakes. Moreover, among household with limited incomes, resources spent on dietary supplements may be better spent elsewhere.

Second, an important focal point for WIC nutrition education efforts is children's intakes of saturated/solid fats and added sugars. Decreased intakes of foods that are major contributors of these dietary constituents would improve the overall healthful-

ness of children's diets and reduce consumption of excess calories. The latter is essential for reducing the prevalence of overweight and obesity.

A challenge in addressing fat intakes of 2-to-3-year-olds is to reduce saturated fat intakes without reducing total fat intakes. Usual intakes of saturated fat were too high (above the DGA guidelines) for 85 percent of children age 2-3, but total fat intakes were within the acceptable range for 74 percent of children age 1-3 and *below* the acceptable range for 25 percent of children. In contrast, because the DRIs for total fat change at age 4, children at this age were found to have a high prevalence of both excessive saturated fat intakes (80 percent had usua intakes of saturated fat above guidelines) and excessive total fat intakes (20 percent had usual intakes of total fat above the AMDR).

Because children's taste preferences and habits develop over time, it is important to work with caregivers and parents to establish and maintain healthful eating habits from very young ages.

- A useful target for efforts to decrease fat intake is whole milk. More than half of the milk consumed by WIC children age 2-4 is whole milk and whole milk contributed 14 percent of the solid fat consumed by WIC children. Children 2 years and older should receive reduced-fat or fat-free milk, consistent with the revised WIC food packages.

- Sweetened beverages are an appropriate target for efforts to decrease intake of added sugars. Dietary recalls for 56 percent of WIC children included one or more sweetened beverages (noncarbonated sweetened beverage or regular soft drink), and almost 40 percent of added sugar intake came from sweetened beverages.

Third, to improve fiber intakes, parents and caregivers of WIC children should be encouraged to offer more whole grain products (only 10 percent of total grain intake was whole grains), whole fruits rather fruit juice (almost 60 percent of total fruit intake was from juices), and offer a wider variety of vegetables (almost 50 percent of total vegetable intake was provided by white potatoes).

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Appendix A
Data and Methods

All tabulations in this report are based on NHANES data, analyzed alone or in conjunction with data from the MyPyramid Equivalents Database. In this appendix, we describe the data, variable construction, and statistical methods.

NHANES Data

The National Health and Nutrition Examination Survey (NHANES) is conducted by the National Center for Health Statistics (NCHS), part of the Centers for Disease Control and Prevention (CDC). NHANES has been conducted on a periodic basis since 1971.[1] Beginning in 1999, NHANES is a continuous annual survey with data released in public data files every two years (e.g., 1999-2000, 2001-02, 2003-04, etc.).

NCHS recommends combining two or more 2-year cycles of the continuous NHANES to increase sample size and produce estimates with greater statistical reliability. Most of the tabulations in this report are based on three 2-year cycles of NHANES data (1999-2004). NHANES 1999-2002 was used in conjunction with the MyPyramid Database (described below).

NHANES includes a 'household interview' conducted in respondents' homes, and a physical examination conducted in Mobile Exam Centers (MEC). Additional interview data were collected at the time of the MEC exam, including a dietary recall interview.

For this study, we used data from the following NHANES data files:

- Body Measures (BMX)
- Demographics (DEMO)
- Diet Behavior and Nutrition (DBQ)
- Dietary Interview Individual Food Files (DRXIFF)
- Dietary Interview, Total Nutrient Intakes (DRXTOT)
- Dietary Supplements (DSQ)
- Food Security (FSQ)
- Reproductive Health (RHQ)

Our sample for all analyses includes persons with complete dietary recalls, excluding pregnant and breastfeeding women, infants, and breastfeeding children. Pregnant and breastfeeding women were excluded due to differences in nutrient requirements and small sample sizes. Infants were excluded because DRI Estimated Average Requirements (EARs) are not defined for infants.

MyPyramid Equivalents Database for USDA Food Codes

The *MyPyramid Food Guidance System* (USDA, CNPP 2005), which replaced the Food Guide Pyramid introduced in 1992, provides estimates of the types and quantities of foods individuals should eat from the different food groups, tailored to individuals' age, gender, and activity level.

In contrast to the earlier Food Pyramid, which provided recommended numbers of servings from each food group, MyPyramid recommendations are in cup or ounce 'equivalents.' Recommendations for vegetable, fruit, and milk consumption are measured in cups or 'cup equivalents'; recommendations for grain and meat and bean consumption are measured in ounces or 'ounce equivalents."

The *MyPyramid Equivalents Database* contains records corresponding to NHANES dietary recalls, with NHANES food intakes measured in MyPyramid equivalents (Friday and Bowman, 2006).[2] Measures are provided for major food groups (grains, vegetables, fruits, milk, meat and beans) and subgroups, plus discretionary oils, discretionary solid fats, added sugar, and alcohol.

[1] NHANES-I was conducted from 1971-75; NHANES-II from 1976-80; and NHANES-III from 1988-94.

[2] MyPyramid Equivalents Database version 1.0 contains data corresponding to NHANES 1999-2000 and 2001-02, and CSFII 1994-96, 1998.

Each individual food may contain components from multiple MyPyramid food groups.

The MyPyramid database contains files corresponding to the NHANES individual food files (one record per food) and NHANES total nutrient files (one record per person, with total daily intake). We merged MyPyramid data to NHANES data for survey years 1999-2002. All analyses of pyramid intakes are limited to this 4-year period.

Subgroups for Tabulation

We tabulated NHANES data to provide estimates for the total U.S. population, and for subgroups defined by program participation and income, and by age group.

Program Participation and Income

WIC participation is measured at the *child level* based on *current receipt of WIC benefits*. Nonparticipants were further subdivided into those who were income-eligible for the WIC and those whose income exceeded the eligibility standard. These groups were identified by the following NHANES data items:

1. WIC participant	if FSD660C > 0
Nonparticipants:	
2. Income-eligible	if 0 d" INDFMPIR < 1.85
3. Higher-income	if INDFMPIR > 1.85

Where,FSD660C = 1 if currently receiving WIC benefitsINDFMPIR = Family poverty income ratio

The NHANES survey includes questions about WIC participation by individuals and household members, currently and in the past 12 months. We used FSD660C to identify children receiving WIC benefits at the time of the survey.

Age Groups

Most tabulations for this report show data for all children age 1-4, and by year of age. Some tabulations are limited to children age 2-4 because data were not available for one-year-olds (MyPyramid) or reference standards do not apply to one-year-olds (Dietary Guidelines; CDC Growth Charts).

Age was defined by the NHANES data item, RIDAGEYR = age at screening recode (defined as the "best age in years at the time of the household screening"). Infants were excluded from analyses and were identified by the NHANES data item, RIDAGEMN <12, where RIDAGEMN = age in months at screening.

Dietary Intake Data, Reference Intake Standards, and Estimation of Usual Intakes

Application of the DRIs requires information about the usual intake distribution for the population of interest. The usual intake distribution can be estimated using two or more days of recall information, or single-day recalls may be adjusted by out-of-sample information about the within-person day-to-day variance for each nutrient.

NHANES Dietary Recalls

Beginning with NHANES 2003-04, NCHS releases two days of dietary recall data for each respondent. The first day (Day 1) is collected in the MEC and the second day (Day 2) is collected by telephone 3 to 10 days later. In 2003-04, 87 percent of respondents completing the first day recall also completed the second day.

For this study, we pooled three 2-year cycles of NHANES (1999-2004). NHANES 1999-2002 public release data contain single-day dietary recalls.[3] Therefore, we estimated usual nutrient intake distributions by first estimating within-person variance components for NHANES 2003-04. These variance components were then used to adjust the single day (first day) intakes of the pooled sample of NHANES 1999-2004.

Usual intakes were estimated using the personal computer version of the ***Software for Intake Distribution Estimation*** (PC-SIDE). PC-SIDE estimates usual intake distributions from single day intakes when provided with information about

[3] Second recalls were collected for the entire sample beginning with NHANES 2002, but the second day recalls from 2002 were not publicly released.

variance components and the fourth moments of variance components (fourth moments are measures of skewness).

PC-SIDE was used to estimate means and proportions, standard errors of estimates, and percentiles of dietary intake distributions for gender by age subgroups. Estimates for both sexes were calculated in SAS as the weighted average of the PC-SIDE estimates for males and females.

Reference Intake Standards

The Dietary Reference Intakes (DRIs) are a group of standards developed by the Food and Nutrition Board of the Institute of Medicine (IOM) to assess the adequacy and quality of nutrient intakes. Four different DRI standards are used to assess the usual nutrient intakes of WIC participants and nonparticipants:

- Estimated Average Requirements (EARs)
- Adequate Intakes (AIs)
- Tolerable Upper Intake Levels (ULs)
- Acceptable Macronutrient Distribution Ranges (AMDRs).

Table A-1 provides the DRI values.

The **Estimated Average Requirement (EAR)** is the level of intake that is estimated to meet the requirements of half of the healthy individuals in a particular life stage and gender group. The EAR is used to assess the prevalence of inadequate intakes using the IOM-recommended "EAR-cutpoint method" (IOM, 2006).

The EAR cut-point method was used to analyze all nutrients for which EARs have been established. The EAR-cutpoint method assumes that nutrient requirements are symmetrically distributed. (For other volumes of this report, it was not appropriate to use of the EAR cut-point method to estimate the prevalence of inadequate iron intakes for menstruating females and the full probability approach (IOM, 2006) was used to assess the adequacy of usual iron intakes among females aged 9-50 years old.)

An **Adequate Intake (AI)** was defined when the data available for a particular nutrient were insufficient to estimate requirements and establish an EAR. The AI is the level of intake that is assumed to be adequate, based on observed or experimentally determined estimates of intake. AIs cannot be used to determine the proportion of a population with inadequate intakes. Instead, assessment focuses on comparison of mean usual intakes to the AI. Populations with a mean usual intake equivalent to or greater than the population-specific AI can be assumed to have adequate intakes.

The **Tolerable Upper Intake Level (UL)** is the maximum level of intake that is likely to pose no risks of adverse health effects for all individuals in a population group. As intake increases above the UL, the risk of adverse effects increases. For most nutrients for which ULs have been established, the UL is based on intake from food, water, and dietary supplements (e.g., fluoride, phosphorus, and vitamin C) (IOM, 2006). For some nutrients, the UL applies only to synthetic forms from dietary supplements, fortified foods, or over-the-counter medications (e.g., magnesium, folate, niacin, and vitamin E).

The NHANES nutrient intake files do not include nutrients provided by water, dietary supplements, or over-the-counter medications. Thus, our ability to assess usual intakes relative to ULs is limited. We estimated the prevalence of intakes above the UL for nutrients for which a UL is available, and found prevalence so small that most tables were populated with zeroes. (This is consistent with data presented in Moshfegh et al. (2005) where, with the exception of sodium and a handful of results for other nutrients, every cell in every table is identical (<3%)). For this reason, we included analyses of intake relative to the UL only for sodium.

The DRIs specify **Acceptable Macronutrient Distribution Ranges (AMDRs)** for macronutrients (protein, carbohydrate, and total fat) and fatty acids (linoleic acid and alpha-linolenic acid).[4] AMDRs define ranges of macronutrient intakes that are associated with reduced risk of chronic disease, while providing recommended intakes of other

[4] Usual protein and carbohydrate intakes are also assessed relative to EARs, based on total intake—gm/day for carbohydrate and gm/ day per kg body weight for protein.

Table A-1—Dietary Reference Intakes for Individuals

	Estimated Average Requirements (EARs)							
	Vitamin A (mcg RAE)	Vitamin C (mg)	Vitamin B-6 (mg)	Vitamin B-12 (mcg)	Vitamin E (mg AT)	Folate (mcg DFE)	Niacin (mg)	Riboflavin (mg)
Males								
1-3 years	210	13	0.4	0.7	5	120	5.0	0.4
4-8 years	275	22	0.5	1.0	6	160	6.0	0.5
9-13 years	445	39	0.8	1.5	9	250	9.0	0.8
14-18 years	630	63	1.1	2.0	12	330	12.0	1.1
19-30 years	625	75	1.1	2.0	12	320	12.0	1.1
31-50 years	625	75	1.1	2.0	12	320	12.0	1.1
51-70 years	625	75	1.4	2.0	12	320	12.0	1.1
71 + years	625	75	1.4	2.0	12	320	12.0	1.1
Females								
1-3 years	210	13	0.4	0.7	5	120	5.0	0.4
4-8 years	275	22	0.5	1.0	6	160	6.0	0.5
9-13 years	420	39	0.8	1.5	12	250	9.0	0.8
14-18 years	485	56	1.0	2.0	12	330	11.0	0.9
19-30 years	500	60	1.1	2.0	12	320	11.0	0.9
31-50 years	500	60	1.1	2.0	12	320	11.0	0.9
51-70 years	500	60	1.3	2.0	12	320	11.0	0.9
71 + years	500	60	1.3	2.0	12	320	11.0	0.9

	Estimated Average Requirements (EARs)						
	Thiamin (mg)	Iron (mg)	Magnesium (mg)	Phosphorus (mg)	Zinc (mg)	Carbohy-drate (g)	Protein (g/kg body wgt)
Males							
1-3 years	0.4	3.0	65	380	2.5	100	0.87
4-8 years	0.5	4.1	110	405	4.0	100	0.76
9-13 years	0.7	5.9	200	1055	7.0	100	0.76
14-18 years	1.0	7.7	340	1055	8.5	100	0.73
19-30 years	1.0	6.0	330	580	9.4	100	0.66
31-50 years	1.0	6.0	350	580	9.4	100	0.66
51-70 years	1.0	6.0	350	580	9.4	100	0.66
71 + years	1.0	6.0	350	580	9.4	100	0.66
Females							
1-3 years	0.4	3.0	65	380	2.5	100	0.87
4-8 years	0.5	4.1	110	405	4.0	100	0.76
9-13 years	0.7	5.7	200	1055	7.0	100	0.76
14-18 years	0.9	7.9	300	1055	7.3	100	0.71
19-30 years	0.9	8.1	255	580	6.8	100	0.66
31-50 years	0.9	8.1	265	580	6.8	100	0.66
51-70 years	0.9	5.0	265	580	6.8	100	0.66
71 + years	0.9	5.0	265	580	6.8	100	0.66

See note at end of table.

Table A-1—Dietary Reference Intakes for Individuals —Continued

	Adequate Intakes (AI)						Upper Tolerable Intake Level (UL)
	Calcium (mg)	Potassium (g)	Sodium (g)	Fiber (g)	Linoleic acid (g)	Linolenic acid (g)	Sodium (g)
Males							
1-3 years	500	3000	1000	19	7	0.7	1.5
4-8 years	800	3800	1200	25	10	0.9	1.9
9-13 years	1300	4500	1500	31	12	1.2	2.2
14-18 years	1300	4700	1500	38	16	1.6	2.3
19-30 years	1000	4700	1500	38	17	1.6	2.3
31-50 years	1000	4700	1500	38	17	1.6	2.3
51-70 years	1200	4700	1300	30	14	1.6	2.3
71 + years	1200	4700	1200	30	14	1.6	2.3
Females							
1-3 years	500	3000	1000	19	7	0.7	1.5
4-8 years	800	3800	1200	25	10	0.9	1.9
9-13 years	1300	4500	1500	26	10	1.0	2.2
14-18 years	1300	4700	1500	26	11	1.1	2.3
19-30 years	1000	4700	1500	25	12	1.1	2.3
31-50 years	1000	4700	1500	25	12	1.1	2.3
51-70 years	1200	4700	1300	21	11	1.1	2.3
71 + years	1200	4700	1200	21	11	1.1	2.3

See note at end of table.

Table A-1—Dietary Reference Intakes for Individuals —Continued

	Acceptable Macronutrient Distribution Ranges (AMDRs)				
	Total fat	Linoleic acid	Linolenic acid	Carbohydrate	Protein
	Range (% energy)				
Children, 1-3 yrs	30 – 40	5 – 10	0.6 – 1.2	45 – 65	5 – 20
Children, 4-18 yrs	25 – 35	5 – 10	0.6 – 1.2	45 – 65	10 – 30
Adults	20 – 35	5 – 10	0.6 – 1.2	45 – 65	10 – 35

Source: Institute of Medicine (IOM), Food and Nutrition Board. *Dietary Reference Intakes,* 1997-2005

essential nutrients. AMDRs are expressed as percentages of total energy intake because their requirements are *not* independent of each other or of the total energy requirement of the individual (IOM, 2006). A key feature of AMDRs is that each has lower and upper bounds. Intakes that fall below or exceed these levels of intake may increase risk of chronic disease.

Variable Construction

For several analyses, we constructed new variables from the original NHANES data elements, as described in this section.

Body Mass Index

NHANES examinations included measurement of body weight and stature (or recumbent length).[5] The NHANES public data files include Body Mass Index (BMI), defined as:

BMI = weight in kilograms / [height in meters]^2

We classified children's weight status based on comparison of BMI-for-age with the percentiles of the CDC BMI-for-age growth chart using the SAS program provided by the CDC at: http://www.cdc.gov/nccdphp/dnpa/growthcharts/sas.htm. The CDC SAS program includes LMS parameters of the smoothed growth curve for each age in months, by gender. The LMS parameters are the median (M), the generalized coefficient of variation (S), and the power in the Box-Cox transformation (L) of the growth curve. Documentation of LMS calculations is available at: http://www.cdc.gov/nchs/about/major/nhanes/growthcharts/datafiles.htm

Body Weight for Analyzing Usual Intakes of Protein Per Kilogram Body Weight

The EAR for protein is specified in terms of protein per kilogram of body weight. We followed the method described in *What We Eat in America* (Moshfegh et al. (2005), Appendix B), which assumes that the EAR refers to the ratio of protein per kg of body weights falling in the healthy range. Thus, if actual body weight is not in the healthy range, a reference body weight is assigned to an individual as follows:

- Children ages 4-18—If BMI-for-age is below the 5th or above the 85th percentile, the reference weight is the weight that places the respondent at the nearest percentile of the healthy range (5th or 85th), given their height. Reference weights associated with the 5th and 85th BMI-for-age percentiles (given age and gender) were determined by modifying the CDC SAS program noted above.
- All children ages 1-3—The protein to body weight ratio was computed using a reference weight of 12 kg for all children.

Meals and Snacks

To analyze meal patterns and nutrient characteristics of meals, we classified all foods in the NHANES food files as part of breakfast lunch, dinner, or snacks. NHANES 1999-2000 and 2001-02 contained 16 codes corresponding to English and Spanish meal names, with two additional codes added for NHANES 2003-04. The codes were mapped into four categories as shown in Table A-2.

Foods reported as meals were coded as breakfast, lunch, and dinner without regard to mealtime. Thus persons were observed to consume from zero to three meals. Snack foods were categorized into 'snack periods' according to meal time so that the number of 'snacks' is equal to the number of times a person consumed food and beverages outside of meals, not the number of individual foods consumed as snacks.

Energy Density

We calculated energy density as the ratio of kilocalories per gram of food. Foods are defined as specified by Ledikwe et al. (2005) as solid and liquid items that are typically consumed as foods. This definition excludes all beverages. Included are soft and liquid foods such as ice cream and soup. Excluded are items typically consumed as bever-

[5] Recumbent length was measured for infants and children up to age 3; stature was measured for persons age 2 and over. Both length and height were measured for children age 24 to 36 months.

Table A-2— NHANES Meal and Snack Codes

Meal Category / Meal name	NHANES Meal Codes 1999-00	2001-02	2003-04
1. Breakfast			
Breakfast	1	1	1
Desayuno	9	10	10
Almuerzo	10	11	11
2. Lunch			
Brunch	2	5	5
Lunch	3	2	2
Comida	11	12	12
3. Dinner			
Dinner	5	3	3
Supper	NA	NA	4
Cena	13	14	14
4. Snacks			
Snack/beverage	4	6	6 / 7
Extended consumption	7	9	9
Merienda	12	13	13
Entre comida, bebida/tentempie	14	15	15 / 18
Bocadillo	15	17	17
Botana	16	16	16
Other	8	91	91
Don't know	99	99	99

ages, such as milkshakes and liquid meal replacements.[6]

The rationale provided by Ledikwe et al. (2005) for including solid foods and not beverages is that, "Intake of foods, as compared with beverages, is more influenced by hunger and less influenced by fluid balance. Beverages may disproportionately affect energy density values."

We implemented this definition by excluding foods at the food group level, after categorizing foods into 3-digit food groups. The following food groups were excluded:

- Milk (white, flavored, soymilk, dry and evaporated milk)
- Protein/meal enhancement drinks
- Non-citrus and citrus juice (juice bars were not excluded)
- Vegetable juice
- Coffee, tea
- Beer, wine, liquor
- Drinking water (identified in NHANES 2003-04 only)
- Soft drinks; sweetened, low calorie, and sugar-free beverages

In addition, all ingredients of "combination beverages" were excluded. These were identified by the NHANES variable for "combination type."

Total calories and total grams were summed on a per person basis for all foods not excluded, to obtain estimates of the average energy density of daily intake.

Nutrient Rich (NR) Score

A nutrient rich score is a ratio that measures the nutrient contribution of a food relative to its energy contribution. We calculated NR scores based on the naturally nutrient rich (NNR) score developed by Drewnowski (2005). The NNR score excludes fortified foods; our NR score does not make that exclusion.

We calculated an NR score based on the 16 nutrients shown in Table A-3. For a single food, the NR score is obtained by calculating a score for each nutrient (equation 1 below), and averaging across the 16 nutrients (equation 2):

$$(1)\quad \%DV_x = \frac{amount per 2000 kcal_x}{DV_x},$$

where x= nutrient 1 to 16

$$(2)\quad NR = \sum_{x=1}^{16} \%DV_x \Big/ 16$$

The NR scores for total daily intakes, meals/snacks, and food groups are obtained by applying equations (1) and (2) to the total nutrients consumed per person at each level of daily intake, meals/snacks, and food groups. Thus, nutrients are summed for each level of analyses; total nutrients are normalized to a "nutrient per 2,000 kcal" measure; the percent DV is calculated for each nutrient; and the NR

[6] Liquid meal replacements include instant breakfast, protein supplements and powder, and meal replacement drinks. Meal replacement bars are included in the definition of solid foods.

Table A-3 — Nutrients and Recommended Daily Values (DVs) used to Calculate Nutrient Rich Scores[a]

Nutrient	Value	Nutrient	Value
Calcium	1300 mg	Vitamin B_{12}	2.4 μg
Folate	400 μg	Vitamin C	90 mg
Iron	18 mg	Vitamin E	15 mg
Magnesium	420 mg	Zinc	11 mg
Potassium	4.7 g	Dietary Fiber	38 g
Riboflavin	1.3 mg	Linoleic acid	17 g
Thiamin	1.2 mg	α-Linolenic acid	1. 6 g
Vitamin A (RAE)	900 mg	Protein	56 g

[a] Daily values are based on maximum RDAs or AIs (calcium, magnesium, potassium, dietary fiber, linoleic acid, and α-linolenic acid), excluding pregnant or lactating women.

score is the average of "%DV" across all nutrients. Nutrients are weighted equally. Consistent with Drenowski, the %DV value is truncated at 2000% DV when implementing equation 1, before the average across nutrients is taken, thus limiting the influence of large concentrations of one nutrient.

The mean NR score must be interpreted with caution. The NR score is not designed to characterize nutrient adequacy or diet quality, but to characterize food choices in terms of nutrient density. The score is normalized to 2,000 kcal, so it does not provide an absolute measure of nutrient intake relative to DVs. Furthermore, the score does not account negatively for "bad nutrients" (saturated fat, cholesterol, and sodium); in contrast, the HEI-2005 accounts for over consumption of "bads." And finally, the score weights all nutrients equally. Thus, a person consuming 2000% DV of one nutrient will have a higher NR score from that single nutrient than a person consuming exactly 100% DV of all nutrients.

The mean NR score for a group of individuals is based on individuals with reported intakes. The score does not weight the contribution of zero intakes (nutrients per 2000 kcal is zero if intake is zero). Thus, the sample size for NR scores per meal varies over meals.

Percent of Energy from SoFAAS

SoFAAS is an acronym for solid fats, alcoholic beverages, and added sugars. Staff at USDA's Center for Nutrition Policy and Promotion (CNPP) developed the SoFAAS measure to provide insight into discretionary calorie intakes.

We measured SoFAAS calories per food and per NHANES respondent using data from the NHANES individual food file (grams of alcohol) and the MyPyramid Equivalents database (grams of discretionary solid fat and teaspoons of added sugar). Analyses of SoFAAS were limited to NHANES 1999-2002 because MyPyramid data for NHANES 2003-04 had not been released at the time of this study.

The measure of SoFFAS calories was constructed at the level of individual food, and then aggregated for daily intake. The measures from the NHANES and MyPyramid file were converted to measures of calories as follows:

(1) Kcal from solid fat = Grams of solid fat × 9

(2) Kcal from alcohol[7] = Grams of alcohol x 7 + (Carbohydrates from beer and wine, excluding carbs from added sugar) x 4

(3) Kcal from added sugar[8] = Teaspoons of added sugar × 4.2 × 4

Alcoholic beverages have foodcodes with the first three digits from 931 to 935. Alcohol from cooking wine is not included in SoFAAS (foodcode 93401300). Carbohydrates from mixed drinks (e.g., orange juice, Bloody Mary mix, soda, etc) are not included in SoFAAS. Note that (2) excludes calories from added sugar to avoid double counting added sugar in steps (2) and (3).

Total calories from SoFAAS were obtained by summing (1) – (3) above, and then expressed as a percentage of total energy:

[7] The algorithm for computing calories from alcoholic beverages was taken from the HEI-2005 SAS code provided at: www.cnpp.usda.gov/HealthyEatingIndex.htm

[8] Each teaspoon of sugar is equivalent to 4.2 grams of table sugar, and each gram of table sugar (carbohydrate) provides 4 calories.

Percent of total energy from SoFAAS =
SoFAAS calories / Total calories x 100

This measure was calculated for total daily intakes, meals/snacks, and food groups by applying steps (1) - (3) to each food record, summing SoFAAS calories and total calories for each level of analysis (daily intake, meals/snacks, and food groups), and calculating the percent SoFAAS based on the summations.

Our analyses of SoFAAS revealed some anomalies with the NHANES data, which we discussed with staff at USDA/ARS. Some food records have grams of discretionary fat in excess of grams of total fat (2,718 records or 1.1 percent), and some food records have calories from added sugar in excess of calories from total sugar.

Problems with discretionary fat

We discussed this problem with ARS staff. They indicated that the problem is due to recipe modifications in the NHANES data that are not accounted for in the MyPyramid data. For example, in the NHANES data, tuna salad might be coded with the same foodcode but one individual's record was modified to reflect the fact that light mayonnaise rather than regular mayonnaise was used in preparation. In the MyPyramid data, each case of tuna salad coded with the same food code received the same amount of discretionary fat, based on the "original" recipe.[9] ARS staff indicated that this problem will be addressed in future releases of NHANES/MyPyramid data. Our solution was to topcode grams of discretionary fat (solids and oils) to sum to grams of total fat, by decreasing both discretionary solid fats and discretionary oils in proportion to their original values.

Problems with added sugar

The MyPyramid Equivalents Database documentation indicates that added sugar was derived by different methods for NHANES 1999-00 and NHANES 2001-02. Methods were improved in the later years and the values of added sugar for 1999-00 were made consistent with 2001-02 for all food codes that appeared in both years with the same total sugar per 100 grams and *same sources of added sugar*. Our examination found that, for some foods, the added sugar values (per 100 grams) for identical food codes in different years varied significantly and calories from added sugar sometimes exceeded calories from total sugar. We chose to use consistent values of added sugar per 100 grams of food across all years of data. The following steps were taken to impose consistency on the added sugar values:

a) For each food code, added sugar per 100 grams was taken from the MyPyramid equivalents database file for 2001-02 ('Equiv0102').
b) For each food code, total sugar per 100 grams was calculated as the median in the NHANES 2001-02 food files.
c) RATIO-1 = ratio of (a) to (b)
d) 1999-2000 NHANES individual food records were merged with 1999-2000 Pyramid data.
e) RATIO-2 = ratio of added to total sugar per 100 grams on 1999-2000 individual food records
f) If RATIO-2 did not equal RATIO-1, added sugar on the 1999-2000 food record was set equal to total sugar multiplied by RATIO-1.
g) For all food codes in 1999-2000 and not in 2001-02, if added sugar (in grams) exceeded total sugar (in grams), added sugar was topcoded at the total sugar value.

After "cleaning" the values for discretionary solid fat and added sugar, 2 percent of food records had total SoFAAS calories in excess of total energy. These are mainly the result of rounding error. These records were topcoded at SoFAAS percent of calories equal to 100.

Foods Categorized for Frequent, Selective, and Occasional Consumption

We categorized NHANES foods according to the radiant pyramid/power calories concept, as described by Zelman and Kennedy (2005). This concept recommends that, within food group, the most nutrient-dense choices be consumed most frequently (to obtain recommended levels of nutrients while maintaining energy balance) and

[9] The data confirm that in the NHANES data there is variation in total fat per 100 grams across records with the same food code, but no variation in discretionary fat for the same records in the MyPyramid data.

choices that are lowest in nutrient density should be consumed only occasionally.

Categorization of foods was implemented through an iterative approach. First, within each of the 10 broad food groups, foods were sorted by Nutrient Rich (NR) score and the percentage of calories from SoFAAS. Decision rules based on the combination of NR score and SoFAAS were applied to each borad food group to provide an initial "break" of foods into 3 categories, thus reducing the need to manually code all foods. Foods were then sorted by 3-digit food subgroup and we reviewed food descriptions, percentage of calories from SoFAAS, and total fat per 100 grams. We divided foods within a food subgroup so that foods with the lowest proportion of calories from SoFAAS/total fat content were included in the "consume frequently" category and foods with the highest proportion of calories from SoFAAS/total fat content were included in the "consume occasionally" category.

The rules used in assigning foods to the three categories were presented in Chapter 5, Table 5-6. These decision rules were informed by general recommendations made in MyPyramid guidance and/or in the Dietary Guidelines for Americans. This categorization was applied only to foods in NHANES 1999-2002 because information about SoFAAS comes from the MyPyramid database, available only for 1999-2002 at the time of this study.

Table A-4 shows the number of foods in the NHANES individual food files (unique food codes) categorized for frequent, selective, or occasional consumption.

Healthy Eating Index-2005 (HEI-2005)

HEI-2005 component and total scores were constructed using the following guidance and resources available from USDA/CNPP: [10]

- Healthy Eating Index-2005 Development and Evaluation Technical Report (Guenther, et al. November 2007), section on "Using the HEI-2005 to Assess Diets of Groups and Individuals"
- CNPP SAS program for computing HEI -2005 scores for a population or group (HEI2005_NHANES0102_PopulationScore.sas)
- Database for whole fruit

The HEI-2005 Technical Report contains the HEI-2005 scoring system and guidance for applying the scoring system to population groups.

The SAS program constructs HEI component scores and total score for a population or group. The program reads the NHANES individual food files, MyPyramid Equivalents Database (equiv0102), and the whole fruit database.

The whole fruit database is supplied as a supplement to the Pyramid equivalents database to support the calculation of the HEI component score for whole fruit. The database contains records corresponding to NHANES 2001-02 food records for persons age 2 and above. The file contains two data items—"whole fruit" and "fruit juice"—measured in cup equivalents per 100 grams of food. For each food, the total fruit cup equivalents from the MyPyramid database was assigned to either whole fruit or juice; foods containing both were assigned to one category depending on the majority component.

Methods for calculating HEI-2005 scores

We calculated HEI-2005 scores for groups of program participants and nonparticipants, using the pooled sample of persons in NHANES 1999-2002. These steps were followed:

a) Merged the whole fruit database to NHANES 1999-2000 food records, by food code and imputed "whole fruit" and "fruit juice" for foods appearing in 1999-2000 and not in the whole fruit database.

b) Followed the procedures in the CNPP SAS program to apply the HEI scoring system "to the ratio of the population's mean food group (or nutrient) intake to the population's mean energy intake", using the SUDAAN PROC RATIO procedure.

[10] The HEI-2005 Technical Report and supporting files are available at http://www.cnpp.usda.gov/HealthyEatingIndex.htm

Table A-4— Number and Percent of NHANES Food Codes Categorized as Foods Suggested for Frequent, Selective, or Occasional Consumption

	Number of food codes			Percent of foods		
	Foods to enjoy frequently	Foods to enjoy selectively	Foods to enjoy occasionally	Foods to enjoy frequently	Foods to enjoy selectively	Foods to enjoy occasionally
All foods	1,244	1,426	2,021	26.5	30.4	43.1
Grains	147	230	159	27.4	42.9	29.7
Plain bread, rolls, bagels, Eng muffin	61	68	9	44.2	49.3	6.5
Tortillas and taco shells	2	3	2	28.6	42.9	28.6
Cereals	72	100	67	30.1	41.8	28.0
Rice and pasta	5	29	20	9.3	53.7	37.0
Other	7	30	61	7.1	30.6	62.2
Vegetables	237	382	245	27.4	44.2	28.4
Raw	42	6	5	79.2	11.3	9.4
Cooked, excl. potatoes	164	238	114	31.8	46.1	22.1
Cooked, potatoes	–	20	47	–	29.8	70.2
Green salads	1	2	36	2.6	5.1	92.3
Beans	24	43	11	30.8	55.1	14.1
Nuts and seeds	1	58	2	1.6	95.1	3.3
Soy products/ meal enhancement	5	15	30	10.0	30.0	60.0
Fruit	113	86	63	43.1	32.8	24.0
Fresh	39	5	11	70.9	9.1	20.0
Canned	35	45	15	36.8	47.4	15.8
Other fruit	2	12	13	7.4	44.4	48.2
Juice (all types)	37	24	24	43.5	28.2	28.2
Milk group	20	20	67	18.7	18.7	62.6
Fluid milk	8	12	41	13.1	19.7	67.2
Dry or Evaporated Milk	7	5	18	23.3	16.7	60.0
Yogurt	5	3	8	31.2	18.8	50.0
Meat and meat alternates	277	258	325	32.2	30.0	37.8
Red meats (beef, lamb, pork, veal)	49	81	76	23.8	39.3	36.9
Other meats	27	20	70	23.1	17.1	59.8
Poultry	84	92	57	36.0	39.5	24.5
Fish/shellfish	99	27	48	56.9	15.5	27.6
Eggs	2	25	24	3.9	49.0	47.1
Cheese	16	13	50	20.2	16.5	63.3
Mixed dishes	374	316	294	38.0	32.1	29.9
Mostly meat	194	150	76	46.2	35.7	18.1
Mostly grain (incl. pizza)	106	151	210	22.7	32.3	45.0
Soup, mostly vegetable	74	15	8	76.3	15.5	8.2
Condiments, Oils, Fats	12	33	99	8.3	22.9	68.8
Added fats	3	31	48	3.7	37.8	58.5
Sweet toppings	9	2	51	14.5	3.2	82.3
Sweets	–	89	562	–	13.7	86.3
Dairy-based desserts	–	80	48	–	62.5	37.5
Baked desserts	–	–	396	–	–	100.0
Other	–	9	118	–	7.1	92.9
Beverages	64	–	168	27.6	–	72.4
Coffee/tea	35	–	35	50.0	–	50.0
Soft drinks	16	–	13	55.2	–	44.8
Noncarbonated beverage	13	–	77	14.4	–	85.6
Alcohol	–	–	43	–	–	100.0
Salty snacks	–	12	39	–	23.5	76.5

– No foods in this category.
Source: NHANES 1999–2004 Individual Food Files.

Table A-5—HEI-2005 Scoring System

Component	Max Score	Criteria for: Zero Score	Criteria for: Max Score	Equation for Score
Total fruit	5	Zero intake	≥ 0.8 cup equivalents per 1000 kcal	$\frac{5}{0.8} \times \frac{f\_total}{energy/1000}$
Whole fruit	5	Zero intake	≥ 0.4 cup equivalents per 1000 kcal	$\frac{5}{0.4} \times \frac{wholefrt}{energy/1000}$
Total vegetables	5	Zero intake	≥ 1.1 cup equivalents per 1000 kcal	$\frac{5}{1.1} \times \frac{v\_total}{energy/1000}$
Dark green & orange vegetables & legumes	5	Zero intake	≥ 0.4 cup equivalents per 1000 kcal	$\frac{5}{0.4} \times \frac{v\_dol}{energy/1000}$
Total grains	5	Zero intake	≥ 3.0 oz equivalents per 1000 kcal	$\frac{5}{3.0} \times \frac{g\_total}{energy/1000}$
Whole grains	5	Zero intake	≥ 1.5 oz equivalents per 1000 kcal	$\frac{5}{1.5} \times \frac{g\_whl}{energy/1000}$
Milk	10	Zero intake	≥ 1.3 cup equivalents per 1000 kcal	$\frac{10}{1.3} \times \frac{d\_total}{energy/1000}$
Meat & beans	10	Zero intake	≥ 2.5 oz equivalents per 1000 kcal	$\frac{10}{2.5} \times \frac{allmeat}{energy/1000}$
Oils	10	Zero intake	≥ 12 grams per 1000 kcal	$\frac{10}{12} \times \frac{discfat\_oil}{energy/1000}$
Saturated fat	10	≥ 15% of kcal	≤ 7% of kcal	For saturated fat between min & max: If >10 then HEI = 8-(8/5 x (%sfat-10)) If ≤10 then HEI =10-(2/3 x (%sfat-7))

Sodium	10	≥ 2.0 grams per 1000 kcal	≤ 0.7 grams per 1000 kcal	For sodium between min & max:
				If >1100 then
				HEI = 8-(8 x (sodium-1100)/900))
				If ≤1100 then
				HEI =10-(2 x (sodium-700)/400))

Calories from SoFAAS	20	≥ 50% of kcal	≤ 20% of kcal	If % calories from SoFAAS < 50: HEI = Min((50 - %SoFAAS)/1.5, 20)

Source: Guenther, et al., 2007.

The HEI-2005 scoring system is shown in Table A-5. Population scores were obtained using the SUDAAN PROC RATIO procedure, using dietary recall sampling weights and age adjustment.

Statistical Methods

We produced estimates for this report using the following two statistical software packages:

- ***PC-SIDE: Software for Intake Distribution Estimation***—used to estimate means, percentiles, and standard errors for nutrient intake tables.

- ***SUDAAN (version 9.0)***—used to calculate means, standard errors, and tests of statistical significance for non-nutrient tables, using the DESCRIPT, CROSSTAB, and RATIO procedures.

Sample weights were used to account for sample design and nonresponse. Information about the NHANES survey design (strata and primary sampling units) was used for estimating variances and testing for statistical significance in SUDAAN.

Sampling Weights

Tables are based on either NHANES 1999-2004 (6 years) or NHANES 1999-2002 (4 years). Accordingly, 6-year weights or 4-year weights were used.

NHANES 1999-2002 public files include two sets of sampling weights: Interview weights and MEC exam weights (MEC weights account for the additional nonresponse to the MEC exam). NHANES 2003-04 also include dietary intake weights. All weights sum to the total US civilian non-institutionalized population in year 2000.

Our sample for analyses includes only persons with complete dietary recalls. We followed the documentation provided in *What We Eat in America (WWEIA)* (Moshfegh et al., 2005, Appendix B) to construct dietary intake sampling weights for NHANES 1999-2002, consistent with the intake weights released with NHANES 2003-04. Dietary intake weights are constructed from the MEC exam weights: a) to account for additional nonresponse to the dietary recall, and b) to provide proportionate weighting of weekday and weekend recalls. The second adjustment is needed because proportionately more dietary recalls occurred on weekends than on weekdays. Since food intake varies by day of week, use of MEC weights would disproportionately represent intakes on weekends. Sample weights for persons with weekday vs. weekend recalls were recalibrated, within demographic group, so that weekday recalls account for 4/7 of the total sample weight.

Dietary intake weights for NHANES 1999-2002 and for NHANES 2003-04 each sum to the US population in year 2000. To construct 6-year weights, we multiplied the 1999-2002 weights by two-thirds and the 2003-04 weights by one-third. Jacknife weights (87 weights) were constructed to account for the NHANES survey design when using PC-SIDE software.

Age Adjusted Totals

This report presents estimates for children age 1-4 years old, by year of age and for "Total". We used age-adjustment to produce estimates for the "Total" of all children age 1-4. The age-adjusted estimates are calculated as the weighted average of estimates for each year of age with the weights equal to year 2000 population. For example, in Appendix B, each year-of-age estimate is calculated by weighting responses by NHANES dietary intake weights. The "Total" rows weight the year-of-age estimates by population weights so that each column in the tables (All Children, WIC Children, Income-eligible Nonparticipating Children, and Higher-income Nonparticipating Children) is weighted by the same set of weights.

This age adjustment eliminates between-group differences due solely to differences in the age distribution of the groups. Age adjustment is an option within the SUDAAN software.

Table A-6 shows the population distribution used for age-adjustment.

Table A-6— Census 2000 Population for Children Age 1-4

Age	Population (1,000's)
1-year-old	3,821
2-years-old	3,790
3-years-old	3,833
4-years-old	3,926

Source: Census 2000 Summary File (SF1).

Tests of Statistical Significance

We tested the statistical significance of differences in means and proportions between WIC participants and each group of nonparticipants using t-tests. When multiple outcome categories were examined simultaneously in Appendix B tables with usual nutrient intake distributions, we used the Bonferroni adjustment to adjust for multiplicity (Lohr, 1999). The statistical significance of differences in distributions (excluding usual nutrient intake distributions) between WIC participants and each group of nonparticipants was tested using chi-square-tests.

Indicators of Statistical Reliability

We tested all estimates for statistically reliability according to recommendations in the *NHANES Analytic Guidelines* (NCHS, 1996). Tables include indicators of estimates that are statistically unreliable due to small sample size or large coefficient of variation.

NHANES recommends flagging estimates as unreliable if any of the following conditions are met:

1. **Inadequate sample size for normal approximation.** For means and for proportions based on commonly occurring events (where $0.25 < P < 0.75$), an estimate is flagged if it is based on a cell size of less than 30 times a "broadly calculated average design effect."
2. **Large coefficient of variation.** Estimates are flagged if the coefficient of variation (ratio of the standard error to the mean expressed as a percent) is greater than 30.
3. **Inadequate sample size for uncommon or very common events.** For proportions below 0.25 or above 0.75, the criteria for statistical reliability is that the cell size be sufficiently large that the minimum of nP and n(1-P) be greater than or equal to 8 times a broadly calculated average design effect, where n is the cell size and P is the estimated proportion.

For each data item, the design effect was calculated for each table cell as the ratio of the complex sampling design variance calculated by SUDAAN, to the simple random sample variance. The average design effect for a data item is the average of estimated design effects across age groups (pooled genders) within a program participation/income group (FS participants, income eligible nonparticipants, and higher-income nonparticipants).

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Appendix B
Nutrient Intake Tables

List of Tables

Table B-1—Food Energy (kcal)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	1400	*(37.8)*	375	1403	*(54.8)*	193	1500	*(66.5)*	191	1338	*(53.4)*
2 years old	784	1524	*(39.7)*	307	1614	*(72.1)*	219	1620	*(53.5)*	220	*1403	*(59.1)*
3 years old	518	1606	*(44.7)*	192	1738	*(102.5)*	171	1607	*(76.1)*	131	*1484	*(62.8)*
4 years old	499	1734	*(46.8)*	132	1650	*(120.3)*	179	1796	*(93.8)*	167	1716	*(53.0)*
Total, age adjusted	2,586	1563	*(23.5)*	1,006	1580	*(46.4)*	762	1638	*(36.6)*	709	1490	*(36.3)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-2—Food Energy (kcal): Distribution of Usual Intake

	Percentiles									Standard errors of percentiles								
	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																		
1 year old	864	970	1042	1150	1364	1608	1759	1872	2058	*(36.1)*	*(34.0)*	*(35.1)*	*(34.4)*	*(37.2)*	*(46.2)*	*(53.6)*	*(57.8)*	*(64.9)*
2 years old	980	1081	1154	1268	1489	1738	1894	2009	2192	*(47.6)*	*(40.7)*	*(39.1)*	*(43.4)*	*(39.9)*	*(55.5)*	*(54.9)*	*(65.3)*	*(102.0)*
3 years old	1085	1188	1259	1367	1579	1815	1955	2057	2219	*(50.3)*	*(44.5)*	*(41.5)*	*(53.1)*	*(68.2)*	*(58.8)*	*(103.0)*	*(128.0)*	*(139.0)*
4 years old	1229	1329	1399	1504	1712	1940	2073	2168	2315	*(48.9)*	*(52.7)*	*(53.1)*	*(50.0)*	*(47.6)*	*(51.0)*	*(63.1)*	*(73.5)*	*(85.4)*
Total, age adjusted	961	1075	1155	1277	1524	1805	1974	2099	2300	*(23.2)*	*(22.2)*	*(22.0)*	*(22.6)*	*(24.2)*	*(27.5)*	*(32.5)*	*(37.1)*	*(46.1)*
WIC children																		
1 year old	842	952	1028	1141	1366	1622	1780	1898	2092	*(40.6)*	*(39.4)*	*(40.4)*	*(43.6)*	*(54.1)*	*(71.0)*	*(82.7)*	*(92.2)*	*(110.0)*
2 years old	999	1115	1197	1325	1584	1871	2036	2153	2333	*(60.2)*	*(64.3)*	*(67.2)*	*(71.1)*	*(76.9)*	*(80.9)*	*(83.5)*	*(86.6)*	*(96.0)*
3 years old	1123	1239	1318	1442	1703	1992	2155	2271	2465	*(92.2)*	*(83.8)*	*(96.0)*	*(107.0)*	*(85.4)*	*(164.0)*	*(189.0)*	*(201.0)*	*(246.0)*
4 years old	1138	1225	1287	1383	1598	1873	2043	2163	2340	*(72.8)*	*(81.4)*	*(91.3)*	*(110.0)*	*(142.0)*	*(147.0)*	*(139.0)*	*(132.0)*	*(124.0)*
Total, age adjusted	934	1048	1128	1254	1529	1852	2043	2180	2399	*(37.1)*	*(50.4)*	*(71.5)*	*(77.2)*	*(59.8)*	*(93.8)*	*(82.0)*	*(76.8)*	*(100.0)*
Income-eligible nonparticipating children																		
1 year old	875	998	1084	1212	1463	1746	1918	2047	2255	*(75.8)*	*(68.5)*	*(67.1)*	*(67.5)*	*(68.0)*	*(82.5)*	*(96.7)*	*(109.0)*	*(131.0)*
2 years old	1083	1184	1255	1366	1592	1843	1989	2093	2253	*(49.2)*	*(48.8)*	*(48.8)*	*(49.4)*	*(52.8)*	*(62.4)*	*(72.2)*	*(81.3)*	*(98.5)*
3 years old	1066	1175	1246	1349	1560	1836	2003	2116	2279	*(101.0)*	*(113.0)*	*(100.0)*	*(70.3)*	*(97.1)*	*(92.5)*	*(131.0)*	*(148.0)*	*(134.0)*
4 years old	1250	1357	1428	1535	1755	2024	2187	2303	2479	*(103.0)*	*(95.9)*	*(95.2)*	*(94.3)*	*(95.5)*	*(108.0)*	*(118.0)*	*(126.0)*	*(137.0)*
Total, age adjusted	990	1116	1204	1337	1598	1895	2080	2217	2432	*(49.9)*	*(37.2)*	*(38.3)*	*(49.0)*	*(40.3)*	*(67.5)*	*(75.7)*	*(70.6)*	*(69.3)*
Higher-income nonparticipating children																		
1 year old	880	972	1036	1131	1318	1523	1643	1730	1867	*(86.1)*	*(75.9)*	*(59.9)*	*(52.3)*	*(84.9)*	*(69.0)*	*(88.8)*	*(109.0)*	*(120.0)*
2 years old	935	1024	1089	1190	1382	1588	* 1710	* 1800	* 1942	*(69.1)*	*(75.0)*	*(76.9)*	*(75.1)*	*(63.5)*	*(64.4)*	*(68.6)*	*(74.1)*	*(88.0)*
3 years old	1071	1153	1210	1297	1470	1655	1759	1832	1944	*(62.9)*	*(61.4)*	*(61.2)*	*(61.9)*	*(65.6)*	*(70.6)*	*(74.0)*	*(76.8)*	*(82.1)*
4 years old	1282	1373	1435	1527	1704	1892	1999	2074	2191	*(63.3)*	*(62.1)*	*(59.0)*	*(53.5)*	*(52.0)*	*(69.3)*	*(84.3)*	*(96.0)*	*(116.0)*
Total, age adjusted	964	1064	1135	1244	1465	1709	1850	1949	2102	*(37.7)*	*(36.5)*	*(36.1)*	*(35.8)*	*(36.8)*	*(41.3)*	*(47.0)*	*(52.7)*	*(64.3)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.
Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-3—Vitamin A (mcg RAE)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	539	*(29.9)*	375	504	*(22.7)*	193	546	*(75.2)*	191	569	*(48.8)*
2 years old	784	534	*(40.4)*	307	569 u	*(181.1)*	219	517	*(35.5)*	220	528	*(43.7)*
3 years old	518	520	*(30.7)*	192	488	*(37.2)*	171	493	*(55.8)*	131	561	*(48.1)*
4 years old	499	529	*(29.0)*	132	470	*(45.1)*	179	552	*(52.3)*	167	541	*(40.0)*
Total, age adjusted	2,586	529	*(19.6)*	1,006	506	*(31.6)*	762	521	*(31.7)*	709	550	*(25.4)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	99.2 u	*(0.37)*	375	99.2 u	*(0.41)*	193	98.6 u	*(0.87)*	191	99.4 u	*(0.39)*
2 years old	784	98.9 u	*(0.50)*	307	98.9 u	*(0.77)*	219	98.5 u	*(1.14)*	220	98.7 u	*(0.88)*
3 years old	518	98.0 u	*(0.90)*	192	98.3 u	*(1.28)*	171	94.6 u	*(3.73)*	131	99.2 u	*(0.57)*
4 years old	499	97.4 u	*(1.10)*	132	94.4 u	*(3.63)*	179	96.5 u	*(2.43)*	167	98.6 u	*(1.05)*
Total, age adjusted	2,586	98.4	*(0.39)*	1,006	97.6	*(1.00)*	762	97.0	*(1.17)*	709	99.0 u	*(0.39)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-4—Vitamin A (mcg RAE): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (µg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	210	296	337	365	408	502	634	723	791	901	*(17.4)*	*(16.2)*	*(15.5)*	*(17.3)*	*(25.1)*	*(37.8)*	*(57.0)*	*(73.5)*	*(101.0)*
2 years old	210	269	306	335	383	498	646	739	806	916	*(15.9)*	*(16.7)*	*(17.6)*	*(19.3)*	*(27.8)*	*(53.7)*	*(75.4)*	*(93.6)*	*(129.0)*
3 years old	210	257	303	336	389	497	625	705	764	859	*(20.9)*	*(20.8)*	*(20.8)*	*(22.2)*	*(28.8)*	*(38.4)*	*(45.1)*	*(50.2)*	*(58.4)*
4 years old	275	306	345	373	417	509	618	685	735	817	*(18.8)*	*(19.7)*	*(20.5)*	*(22.1)*	*(27.0)*	*(35.1)*	*(41.5)*	*(47.1)*	*(58.1)*
Total, age adjusted	–	273	316	348	397	502	630	711	773	876	*(16.5)*	*(14.0)*	*(12.0)*	*(18.0)*	*(35.9)*	*(27.0)*	*(40.8)*	*(72.8)*	*(146.0)*
WIC children																			
1 year old	210	281	320	348	392	484	594	661	711	793	*(16.6)*	*(16.9)*	*(17.4)*	*(18.4)*	*(22.1)*	*(28.7)*	*(33.6)*	*(37.7)*	*(45.3)*
2 years old	210	270	306	333	377	488	669	804 u	916 u	1118 u	*(35.7)*	*(34.0)*	*(30.2)*	*(40.4)*	*(84.8)*	*(148.0)*	*(331.0)*	*(525.0)*	*(929.0)*
3 years old	210	253	291	319	364	461	582	660	718	816	*(26.7)*	*(27.0)*	*(26.7)*	*(26.5)*	*(33.8)*	*(49.8)*	*(59.4)*	*(68.1)*	*(91.7)*
4 years old	275	269	305	330	369	451	550	612	658	736	*(30.0)*	*(32.0)*	*(33.7)*	*(36.3)*	*(42.1)*	*(51.9)*	*(60.8)*	*(69.2)*	*(86.7)*
Total, age adjusted	–	265	304	331	373	464	589	682	756	888	*(22.3)*	*(22.8)*	*(17.7)*	*(20.7)*	*(18.9)*	*(54.0)*	*(74.0)*	*(85.6)*	*(146.0)*
Income-eligible nonparticipating children																			
1 year old	210	276	319	347	389	487	642	755	844	999 u	*(25.5)*	*(24.1)*	*(25.7)*	*(31.2)*	*(41.2)*	*(92.0)*	*(154.0)*	*(209.0)*	*(313.0)*
2 years old	210	266	307	336	383	489	620	701	761	861	*(24.9)*	*(23.9)*	*(26.8)*	*(32.5)*	*(37.3)*	*(46.5)*	*(55.4)*	*(61.7)*	*(73.7)*
3 years old	210	205	255	292	350	466	604	694	763	875	*(43.5)*	*(47.2)*	*(48.0)*	*(47.3)*	*(48.8)*	*(68.1)*	*(87.7)*	*(104.0)*	*(128.0)*
4 years old	275	294	337	368	418	524	655	738	802	908	*(33.9)*	*(35.3)*	*(36.9)*	*(39.9)*	*(48.6)*	*(64.4)*	*(79.0)*	*(92.7)*	*(121.0)*
Total, age adjusted	–	250	295	327	379	488	625	715	784	902	*(19.2)*	*(20.7)*	*(21.5)*	*(22.1)*	*(30.8)*	*(33.6)*	*(57.7)*	*(84.7)*	*(134.0)*
Higher-income nonparticipating children																			
1 year old	210	312	355	385	432	537	677	767	833	935	*(30.0)*	*(30.4)*	*(31.3)*	*(34.4)*	*(46.1)*	*(63.8)*	*(74.8)*	*(82.6)*	*(93.8)*
2 years old	210	270	313	345	396	505	636	715	772	863	*(29.1)*	*(32.1)*	*(34.3)*	*(37.7)*	*(44.4)*	*(51.9)*	*(57.3)*	*(61.9)*	*(70.8)*
3 years old	210	292	339	373	427	541	673	752	809	898	*(26.9)*	*(28.9)*	*(30.9)*	*(34.8)*	*(45.0)*	*(59.9)*	*(70.2)*	*(78.4)*	*(92.4)*
4 years old	275	329	367	395	438	528	629	689	731	797	*(40.5)*	*(43.6)*	*(43.6)*	*(41.2)*	*(37.8)*	*(46.4)*	*(53.0)*	*(57.4)*	*(66.3)*
Total, age adjusted	–	290	335	368	420	529	658	735	792	882	*(15.1)*	*(16.1)*	*(17.0)*	*(18.8)*	*(24.5)*	*(33.2)*	*(38.7)*	*(42.6)*	*(48.5)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-5—Vitamin C (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	101.6	*(6.03)*	375	109.4	*(6.20)*	193	96.4	*(10.64)*	191	94.6	*(10.90)*
2 years old	784	103.9	*(7.67)*	307	121.4	*(10.10)*	219	111.8	*(20.88)*	220	* 87.8	*(10.76)*
3 years old	518	97.4	*(6.98)*	192	117.9	*(17.37)*	171	91.9	*(11.36)*	131	86.9	*(12.01)*
4 years old	499	98.8	*(6.21)*	132	93.2	*(14.25)*	179	96.3	*(8.98)*	167	102.7	*(13.56)*
Total, age adjusted	2,586	100.9	*(4.02)*	1,006	111.4	*(5.16)*	762	99.5	*(7.20)*	709	* 93.2	*(7.28)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	100.0	*(0.01)*	375	100.0	*(0.00)*	193	99.9	*(0.13)*	191	100.0	*(0.11)*
2 years old	784	99.5	*(0.20)*	307	99.7	*(0.21)*	219	99.7	*(0.41)*	220	99.4	*(0.38)*
3 years old	518	99.8	*(0.13)*	192	100.0	*(0.08)*	171	99.7	*(0.29)*	131	99.8	*(0.31)*
4 years old	499	99.4	*(0.33)*	132	98.6	*(1.63)*	179	99.7	*(0.36)*	167	99.4	*(0.40)*
Total, age adjusted	2,586	99.7	*(0.10)*	1,006	99.6	*(0.42)*	762	99.7	*(0.16)*	709	99.6	*(0.16)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-6—Vitamin C (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	13	38	47	53	65	92	127	151	169	198	*(3.29)*	*(3.15)*	*(3.02)*	*(3.24)*	*(5.31)*	*(7.62)*	*(9.56)*	*(11.50)*	*(16.10)*
2 years old	13	30	39	47	60	90	131	160	182	223	*(3.34)*	*(3.95)*	*(4.36)*	*(4.99)*	*(6.44)*	*(9.21)*	*(12.40)*	*(15.90)*	*(24.40)*
3 years old	13	33	42	49	61	88	124	147	165	194	*(4.03)*	*(4.52)*	*(4.86)*	*(5.38)*	*(6.60)*	*(8.84)*	*(11.00)*	*(12.90)*	*(16.70)*
4 years old	22	38	47	54	65	91	124	145	161	186	*(4.08)*	*(4.42)*	*(4.67)*	*(5.07)*	*(5.99)*	*(7.50)*	*(8.88)*	*(10.20)*	*(12.70)*
Total, age adjusted	–	38	47	54	65	92	126	149	166	195	*(2.35)*	*(2.58)*	*(2.74)*	*(3.01)*	*(3.71)*	*(5.00)*	*(6.16)*	*(7.25)*	*(9.51)*
WIC children																			
1 year old	13	44	53	61	73	101	136	159	177	205	*(3.42)*	*(3.77)*	*(4.05)*	*(4.53)*	*(5.74)*	*(7.85)*	*(9.76)*	*(11.50)*	*(15.00)*
2 years old	13	37	49	59	75	111	157	185	207	241	*(7.30)*	*(7.91)*	*(8.23)*	*(9.08)*	*(11.90)*	*(13.20)*	*(14.00)*	*(14.90)*	*(15.90)*
3 years old	13	40	50	57	71	104	143	180	204	244	*(6.26)*	*(7.44)*	*(8.36)*	*(9.92)*	*(13.90)*	*(20.10)*	*(27.60)*	*(33.70)*	*(45.80)*
4 years old	22	32 u	41	48	59	85	118	140	156	182	*(10.20)*	*(10.60)*	*(10.70)*	*(10.90)*	*(12.10)*	*(16.20)*	*(21.20)*	*(26.30)*	*(37.90)*
Total, age adjusted	–	42	52	60	73	102	140	164	183	212	*(3.82)*	*(3.98)*	*(4.06)*	*(4.22)*	*(4.94)*	*(6.56)*	*(8.05)*	*(9.43)*	*(12.30)*
Income-eligible nonparticipating children																			
1 year old	13	32	41	47	59	87	124	148	165	192	*(4.80)*	*(5.56)*	*(6.18)*	*(7.37)*	*(10.30)*	*(13.80)*	*(16.40)*	*(18.40)*	*(21.90)*
2 years old	13	32	41	49	61	91	135	169	199	258 u	*(5.86)*	*(7.22)*	*(7.67)*	*(8.36)*	*(14.40)*	*(22.70)*	*(34.10)*	*(49.50)*	*(88.70)*
3 years old	13	30	38	45	56	82	117	140	158	187	*(5.07)*	*(5.78)*	*(6.29)*	*(7.13)*	*(9.41)*	*(14.40)*	*(19.10)*	*(23.40)*	*(31.70)*
4 years old	22	40	49	55	66	91	121	138	151	170	*(5.73)*	*(6.52)*	*(6.93)*	*(7.57)*	*(10.10)*	*(13.40)*	*(13.70)*	*(13.50)*	*(14.80)*
Total, age adjusted	–	36	45	52	63	90	124	147	165	195	*(3.21)*	*(3.50)*	*(3.74)*	*(4.19)*	*(5.31)*	*(8.22)*	*(11.90)*	*(15.90)*	*(25.40)*
Higher-income nonparticipating children																			
1 year old	13	36	44	51	61	85	117	139	156	186	*(4.23)*	*(4.71)*	*(5.09)*	*(5.81)*	*(8.32)*	*(13.70)*	*(18.50)*	*(22.90)*	*(31.30)*
2 years old	13	25	33	40	51	78	112	135	152	184	*(3.97)*	*(4.80)*	*(5.41)*	*(6.39)*	*(8.67)*	*(12.80)*	*(17.10)*	*(21.60)*	*(31.00)*
3 years old	13	32	40	46	57	80	110	129	143	165	*(7.45)*	*(8.41)*	*(9.08)*	*(10.10)*	*(12.20)*	*(14.60)*	*(16.30)*	*(17.80)*	*(20.60)*
4 years old	22	39	49	56	67	94	128	151	168	196	*(6.73)*	*(8.08)*	*(9.07)*	*(10.60)*	*(13.30)*	*(17.10)*	*(19.80)*	*(21.80)*	*(24.70)*
Total, age adjusted	–	36	44	51	61	85	116	137	152	177	*(3.63)*	*(4.05)*	*(4.35)*	*(4.89)*	*(6.39)*	*(8.84)*	*(10.80)*	*(12.50)*	*(15.80)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-7—Vitamin B_6

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	1.30	*(0.046)*	375	1.34	*(0.047)*	193	1.25	*(0.073)*	191	1.29	*(0.098)*
2 years old	784	1.42	*(0.067)*	307	1.58	*(0.160)*	219	1.39	*(0.068)*	220	1.32	*(0.136)*
3 years old	518	1.44	*(0.072)*	192	1.57	*(0.116)*	171	1.40	*(0.114)*	131	1.34	*(0.112)*
4 years old	499	1.49	*(0.075)*	132	1.47	*(0.162)*	179	1.47	*(0.109)*	167	1.54	*(0.169)*
Total, age adjusted	2,586	1.41	*(0.039)*	1,006	1.48	*(0.056)*	762	1.39	*(0.049)*	709	1.36	*(0.069)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	100.0 u	*(0.08)*	375	100.0 u	*(0.10)*	193	99.9 u	*(0.15)*	191	100.0 u	*(0.07)*
2 years old	784	100.0 u	*(0.00)*	307	100.0 u	*(0.00)*	219	100.0 u	*(0.00)*	220	100.0 u	*(0.00)*
3 years old	518	100.0 u	*(0.00)*	192	100.0 u	*(0.00)*	171	100.0 u	*(0.00)*	131	100.0 u	*(0.00)*
4 years old	499	99.8 u	*(0.16)*	132	99.5 u	*(0.61)*	179	99.8 u	*(0.38)*	167	100.0 u	*(0.12)*
Total, age adjusted	2,586	100.0 u	*(0.04)*	1,006	99.9 u	*(0.16)*	762	99.9 u	*(0.10)*	709	100.0 u	*(0.04)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-8—Vitamin B_6: Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	0.4	0.77	0.87	0.93	1.04	1.25	1.51	1.67	1.80	2.01	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.06)*	*(0.08)*	*(0.10)*	*(0.13)*
2 years old	0.4	0.78	0.89	0.97	1.09	1.34	1.66	1.87	2.03	2.31	*(0.05)*	*(0.05)*	*(0.05)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.10)*	*(0.15)*	*(0.24)*
3 years old	0.4	0.87	0.97	1.04	1.15	1.39	1.67	1.84	1.96	2.15	*(0.05)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.09)*	*(0.10)*	*(0.12)*
4 years old	0.5	0.86	0.97	1.05	1.18	1.43	1.74	1.93	2.08	2.32	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.10)*	*(0.12)*	*(0.16)*
Total, age adjusted	–	0.80	0.90	0.98	1.10	1.35	1.65	1.84	1.98	2.23	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.06)*	*(0.07)*	*(0.10)*
WIC children																			
1 year old	0.4	0.78	0.88	0.96	1.07	1.29	1.56	1.73	1.85	2.06	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.06)*	*(0.08)*	*(0.09)*	*(0.12)*
2 years old	0.4	0.86	0.97	1.05	1.18	1.46	1.83	2.10	2.31	2.69	*(0.06)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.09)*	*(0.18)*	*(0.27)*	*(0.36)*	*(0.55)*
3 years old	0.4	0.95	1.06	1.14	1.27	1.53	1.83	2.01	2.13	2.33	*(0.07)*	*(0.07)*	*(0.08)*	*(0.09)*	*(0.11)*	*(0.15)*	*(0.17)*	*(0.19)*	*(0.21)*
4 years old	0.5	0.74	0.85	0.94	1.08	1.39	1.77	2.02	2.20	2.50	*(0.18)*	*(0.18)*	*(0.18)*	*(0.17)*	*(0.18)*	*(0.18)*	*(0.18)*	*(0.21)*	*(0.27)*
Total, age adjusted	–	0.81	0.92	1.00	1.13	1.40	1.74	1.96	2.12	2.41	*(0.05)*	*(0.05)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.07)*	*(0.09)*	*(0.12)*	*(0.17)*
Income-eligible nonparticipating children																			
1 year old	0.4	0.72	0.82	0.89	1.00	1.21	1.46	1.62	1.73	1.93	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.08)*	*(0.10)*	*(0.13)*	*(0.17)*
2 years old	0.4	0.82	0.92	1.00	1.11	1.36	1.63	1.80	1.92	2.10	*(0.06)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.10)*	*(0.12)*	*(0.14)*
3 years old	0.4	0.81	0.91	0.98	1.10	1.35	1.65	1.83	1.97	2.18	*(0.08)*	*(0.08)*	*(0.09)*	*(0.09)*	*(0.11)*	*(0.14)*	*(0.16)*	*(0.18)*	*(0.22)*
4 years old	0.5	0.84	0.96	1.04	1.18	1.44	1.74	1.91	2.02	2.20	*(0.12)*	*(0.11)*	*(0.11)*	*(0.11)*	*(0.11)*	*(0.12)*	*(0.13)*	*(0.14)*	*(0.15)*
Total, age adjusted	–	0.78	0.89	0.96	1.09	1.34	1.64	1.82	1.95	2.15	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.07)*	*(0.09)*
Higher-income nonparticipating children																			
1 year old	0.4	0.78	0.87	0.92	1.02	1.21	1.48	1.65	1.79	2.03	*(0.05)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.12)*	*(0.16)*	*(0.20)*	*(0.28)*
2 years old	0.4	0.73	0.83	0.90	1.02	1.26	1.54	1.72	1.86	2.11	*(0.13)*	*(0.11)*	*(0.09)*	*(0.08)*	*(0.16)*	*(0.17)*	*(0.17)*	*(0.20)*	*(0.30)*
3 years old	0.4	0.83	0.92	0.98	1.08	1.30	1.55	1.70	1.81	1.98	*(0.06)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.10)*	*(0.14)*	*(0.17)*	*(0.19)*	*(0.24)*
4 years old	0.5	0.93	1.04	1.12	1.23	1.47	1.76	1.96	2.12	2.40	*(0.07)*	*(0.08)*	*(0.08)*	*(0.08)*	*(0.11)*	*(0.22)*	*(0.30)*	*(0.37)*	*(0.52)*
Total, age adjusted	–	0.80	0.90	0.97	1.07	1.30	1.58	1.76	1.90	2.14	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.08)*	*(0.11)*	*(0.14)*	*(0.20)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-9—Vitamin B_{12}

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	4.24	*(0.146)*	375	4.17	*(0.181)*	193	4.57	*(0.355)*	191	4.20	*(0.284)*
2 years old	784	4.50	*(0.410)*	307	5.77 u	*(2.240)*	219	4.73	*(0.416)*	220	4.01	*(0.315)*
3 years old	518	4.38	*(0.577)*	192	4.35	*(0.353)*	171	4.78	*(0.980)*	131	3.82	*(0.340)*
4 years old	499	4.16	*(0.208)*	132	3.98	*(0.475)*	179	4.27	*(0.399)*	167	4.18	*(0.583)*
Total, age adjusted	2,586	4.31	*(0.151)*	1,006	4.53	*(0.494)*	762	4.55	*(0.334)*	709	4.05	*(0.196)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	100.0 u	*(0.01)*	375	100.0 u	*(0.01)*	193	100.0 u	*(0.02)*	191	100.0 u	*(0.11)*
2 years old	784	100.0 u	*(0.00)*	307	100.0 u	*(0.00)*	219	100.0 u	*(0.00)*	220	100.0 u	*(0.00)*
3 years old	518	100.0 u	*(0.00)*	192	100.0 u	*(0.00)*	171	100.0 u	*(0.00)*	131	100.0 u	*(0.00)*
4 years old	499	100.0 u	*(0.00)*	132	100.0 u	*(0.00)*	179	100.0 u	*(0.00)*	167	100.0 u	*(0.00)*
Total, age adjusted	2,586	100.0 u	*(0.00)*	1,006	100.0 u	*(0.00)*	762	100.0 u	*(0.01)*	709	100.0 u	*(0.03)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-10—Vitamin B_{12}: Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (µg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	0.7	2.18	2.56	2.83	3.24	4.08	5.05	5.66	6.12	6.89	*(0.11)*	*(0.11)*	*(0.11)*	*(0.12)*	*(0.14)*	*(0.18)*	*(0.22)*	*(0.25)*	*(0.32)*
2 years old	0.7	1.95	2.31	2.59	3.02	3.95	5.20	6.16	7.00	8.68	*(0.14)*	*(0.16)*	*(0.18)*	*(0.22)*	*(0.25)*	*(0.67)*	*(0.78)*	*(0.84)*	*(1.46)*
3 years old	0.7	2.32	2.64	2.87	3.26	4.13	5.22	5.90	6.41	7.25 u	*(0.18)*	*(0.18)*	*(0.27)*	*(0.34)*	*(0.69)*	*(1.01)*	*(0.80)*	*(1.57)*	*(3.93)*
4 years old	1.0	2.53	2.83	3.04	3.37	4.04	4.82	5.29	5.63	6.18	*(0.16)*	*(0.18)*	*(0.18)*	*(0.20)*	*(0.21)*	*(0.25)*	*(0.32)*	*(0.39)*	*(0.53)*
Total, age adjusted	–	1.97	2.34	2.61	3.06	3.98	5.04	5.74	6.34	7.59	*(0.09)*	*(0.09)*	*(0.09)*	*(0.09)*	*(0.11)*	*(0.16)*	*(0.21)*	*(0.27)*	*(0.50)*
WIC children																			
1 year old	0.7	2.11	2.49	2.75	3.16	4.00	4.99	5.61	6.07	6.82	*(0.16)*	*(0.17)*	*(0.17)*	*(0.18)*	*(0.19)*	*(0.23)*	*(0.26)*	*(0.29)*	*(0.36)*
2 years old	0.7	2.07	2.48	2.78	3.25	4.19	5.74	7.36	9.08 u	13.18 u	*(0.21)*	*(0.24)*	*(0.25)*	*(0.26)*	*(0.33)*	*(0.88)*	*(2.03)*	*(3.63)*	*(8.36)*
3 years old	0.7	2.67	2.99	3.21	3.56	4.26	5.03	5.49	5.83	6.37	*(0.23)*	*(0.24)*	*(0.25)*	*(0.27)*	*(0.35)*	*(0.44)*	*(0.50)*	*(0.56)*	*(0.68)*
4 years old	1.0	2.30	2.60	2.81	3.15	3.87	4.68	5.17	5.52	6.07	*(0.40)*	*(0.42)*	*(0.44)*	*(0.46)*	*(0.49)*	*(0.52)*	*(0.53)*	*(0.54)*	*(0.56)*
Total, age adjusted	–	1.99	2.38	2.68	3.14	4.03	5.14	6.08	6.96	8.78	*(0.19)*	*(0.17)*	*(0.19)*	*(0.21)*	*(0.28)*	*(0.31)*	*(0.80)*	*(1.24)*	*(2.16)*
Income-eligible nonparticipating children																			
1 year old	0.7	2.28	2.70	2.99	3.44	4.35	5.45	6.15	6.69	7.58	*(0.27)*	*(0.30)*	*(0.32)*	*(0.32)*	*(0.33)*	*(0.44)*	*(0.52)*	*(0.57)*	*(0.73)*
2 years old	0.7	2.20	2.50	2.80	3.30	4.30	5.70	6.60	7.40	8.70	*(0.22)*	*(0.23)*	*(0.24)*	*(0.25)*	*(0.32)*	*(0.46)*	*(0.66)*	*(0.90)*	*(1.48)*
3 years old	0.7	2.20	2.50	2.80	3.20	4.30	5.80	6.80	7.70 u	9.00 u	*(0.30)*	*(0.31)*	*(0.33)*	*(0.36)*	*(0.52)*	*(1.18)*	*(1.90)*	*(2.56)*	*(3.86)*
4 years old	1.0	2.51	2.83	3.06	3.42	4.16	5.01	5.51	5.86	6.42	*(0.33)*	*(0.33)*	*(0.34)*	*(0.35)*	*(0.38)*	*(0.46)*	*(0.52)*	*(0.56)*	*(0.64)*
Total, age adjusted	–	2.00	2.40	2.70	3.10	4.10	5.40	6.30	7.10	8.60	*(0.14)*	*(0.16)*	*(0.17)*	*(0.18)*	*(0.25)*	*(0.38)*	*(0.46)*	*(0.72)*	*(1.61)*
Higher-income nonparticipating children																			
1 year old	0.7	2.23	2.63	2.90	3.30	4.07	4.94	5.49	5.92	6.62	*(0.30)*	*(0.25)*	*(0.22)*	*(0.20)*	*(0.25)*	*(0.36)*	*(0.45)*	*(0.52)*	*(0.63)*
2 years old	0.7	1.80	2.20	2.40	2.80	3.80	4.90	5.70	6.20	7.10	*(0.22)*	*(0.24)*	*(0.25)*	*(0.27)*	*(0.32)*	*(0.38)*	*(0.45)*	*(0.51)*	*(0.63)*
3 years old	0.7	2.17	2.46	2.67	3.01	3.71	4.50	4.98	5.32	5.85	*(0.24)*	*(0.27)*	*(0.29)*	*(0.32)*	*(0.36)*	*(0.38)*	*(0.41)*	*(0.45)*	*(0.52)*
4 years old	1.0	2.60	2.89	3.10	3.41	4.05	4.81	5.28 u	5.63 u	6.20 u	*(0.24)*	*(0.38)*	*(0.46)*	*(0.51)*	*(0.40)*	*(0.83)*	*(1.66)*	*(2.37)*	*(3.56)*
Total, age adjusted	–	1.93	2.30	2.57	2.98	3.84	4.88	5.54	6.04	6.89	*(0.14)*	*(0.14)*	*(0.15)*	*(0.15)*	*(0.20)*	*(0.25)*	*(0.36)*	*(0.53)*	*(0.85)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-11—Vitamin E (mg AT)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	3.7	*(0.17)*	375	3.9	*(0.30)*	193	3.6	*(0.31)*	191	3.5	*(0.27)*
2 years old	784	4.0	*(0.23)*	307	4.5	*(0.40)*	219	4.0	*(0.25)*	220	3.6	*(0.42)*
3 years old	518	4.1	*(0.19)*	192	4.6	*(0.36)*	171	4.1	*(0.24)*	131	3.7	*(0.30)*
4 years old	499	4.6	*(0.26)*	132	4.5	*(0.56)*	179	4.5	*(0.39)*	167	4.8	*(0.37)*
Total, age adjusted	2,586	4.1	*(0.11)*	1,006	4.3	*(0.18)*	762	4.1	*(0.16)*	709	4.0	*(0.19)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	17.8	*(2.79)*	375	20.9	*(4.91)*	193	17.3	*(5.12)*	191	14.9	*(4.92)*
2 years old	784	19.8	*(5.47)*	307	30.8	*(9.25)*	219	17.7	*(6.66)*	220	11.3	*(8.91)*
3 years old	518	20.9	*(4.96)*	192	33.2	*(10.40)*	171	19.8	*(6.20)*	131	12.8	*(6.71)*
4 years old	499	10.0	*(4.62)*	132	9.7	*(9.06)*	179	9.5	*(6.50)*	167	12.6	*(8.55)*
Total, age adjusted	2,586	17.1	*(2.29)*	1,006	23.5	*(4.33)*	762	16.0	*(3.08)*	709	12.9	*(3.73)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-12—Vitamin E (mg AT): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	5	1.66	1.95	2.16	2.52	3.33	4.46	5.27	5.93	7.14	*(0.11)*	*(0.10)*	*(0.09)*	*(0.10)*	*(0.16)*	*(0.21)*	*(0.28)*	*(0.34)*	*(0.49)*
2 years old	5	2.26	2.52	2.72	3.04	3.77	4.72	5.33	5.79	6.57	*(0.10)*	*(0.11)*	*(0.12)*	*(0.13)*	*(0.16)*	*(0.27)*	*(0.38)*	*(0.49)*	*(0.72)*
3 years old	5	2.40	2.68	2.89	3.23	3.95	4.81	5.34	5.73	6.38	*(0.10)*	*(0.11)*	*(0.12)*	*(0.14)*	*(0.19)*	*(0.24)*	*(0.28)*	*(0.31)*	*(0.37)*
4 years old	6	3.10	3.37	3.56	3.87	4.51	5.25	5.68	6.00	6.50	*(0.20)*	*(0.20)*	*(0.21)*	*(0.22)*	*(0.25)*	*(0.29)*	*(0.32)*	*(0.35)*	*(0.42)*
Total, age adjusted	–	1.96	2.27	2.50	2.88	3.77	4.96	5.75	6.36	7.41	*(0.06)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.10)*	*(0.13)*	*(0.17)*	*(0.20)*	*(0.29)*
WIC children																			
1 year old	5	1.65	1.97	2.21	2.59	3.47	4.69	5.58	6.30	7.63	*(0.16)*	*(0.16)*	*(0.17)*	*(0.18)*	*(0.22)*	*(0.36)*	*(0.50)*	*(0.66)*	*(0.98)*
2 years old	5	2.38	2.68	2.90	3.28	4.17	5.32	6.05	6.59	7.49	*(0.16)*	*(0.21)*	*(0.25)*	*(0.28)*	*(0.30)*	*(0.54)*	*(0.79)*	*(1.00)*	*(1.39)*
3 years old	5	2.45	2.81	3.08	3.51	4.38	5.38	6.02	6.51	7.35	*(0.22)*	*(0.21)*	*(0.23)*	*(0.30)*	*(0.43)*	*(0.46)*	*(0.53)*	*(0.60)*	*(0.74)*
4 years old	6	2.93	3.20	3.39	3.70	4.36	5.14	5.62	5.98	6.54	*(0.39)*	*(0.42)*	*(0.45)*	*(0.48)*	*(0.55)*	*(0.64)*	*(0.70)*	*(0.75)*	*(0.84)*
Total, age adjusted	–	1.90	2.30	2.50	2.90	3.90	5.20	6.10	6.80	8.10	*(0.11)*	*(0.12)*	*(0.13)*	*(0.14)*	*(0.16)*	*(0.22)*	*(0.29)*	*(0.37)*	*(0.54)*
Income-eligible nonparticipating children																			
1 year old	5	1.54	1.81	2.03	2.39	3.25	4.42	5.23	5.87	7.00	*(0.20)*	*(0.23)*	*(0.25)*	*(0.26)*	*(0.27)*	*(0.43)*	*(0.49)*	*(0.55)*	*(0.75)*
2 years old	5	2.45	2.72	2.92	3.24	3.91	4.68	5.14	5.48	6.01	*(0.19)*	*(0.19)*	*(0.19)*	*(0.20)*	*(0.24)*	*(0.30)*	*(0.35)*	*(0.38)*	*(0.45)*
3 years old	5	2.55	2.79	2.98	3.28	3.94	4.76	5.27	5.64	6.24	*(0.14)*	*(0.15)*	*(0.16)*	*(0.18)*	*(0.22)*	*(0.29)*	*(0.35)*	*(0.40)*	*(0.51)*
4 years old	6	2.94	3.22	3.42	3.73	4.39	5.16	5.62	5.96	6.48	*(0.28)*	*(0.30)*	*(0.31)*	*(0.33)*	*(0.38)*	*(0.46)*	*(0.51)*	*(0.54)*	*(0.61)*
Total, age adjusted	–	1.99	2.31	2.55	2.94	3.81	4.92	5.65	6.22	7.16	*(0.12)*	*(0.11)*	*(0.10)*	*(0.11)*	*(0.18)*	*(0.21)*	*(0.23)*	*(0.27)*	*(0.35)*
Higher-income nonparticipating children																			
1 year old	5	1.78	2.04	2.22	2.50	3.19	4.24	4.99	5.57	6.54	*(0.14)*	*(0.14)*	*(0.14)*	*(0.15)*	*(0.26)*	*(0.38)*	*(0.48)*	*(0.57)*	*(0.75)*
2 years old	5	2.08	2.33	2.53	2.84	3.50	4.28	4.75	5.10	5.69	*(0.23)*	*(0.22)*	*(0.22)*	*(0.26)*	*(0.42)*	*(0.55)*	*(0.64)*	*(0.72)*	*(0.93)*
3 years old	5	2.21	2.47	2.66	2.96	3.61	4.38	4.86	5.21	5.76	*(0.17)*	*(0.18)*	*(0.20)*	*(0.23)*	*(0.30)*	*(0.37)*	*(0.43)*	*(0.48)*	*(0.58)*
4 years old	6	3.31	3.58	3.78	4.08	4.71	5.43	5.86	6.18	6.68	*(0.29)*	*(0.30)*	*(0.30)*	*(0.30)*	*(0.33)*	*(0.41)*	*(0.49)*	*(0.57)*	*(0.76)*
Total, age adjusted	–	1.96	2.23	2.44	2.79	3.66	4.82	5.54	6.07	6.96	*(0.16)*	*(0.10)*	*(0.14)*	*(0.22)*	*(0.20)*	*(0.28)*	*(0.38)*	*(0.42)*	*(0.56)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-13—Folate (mcg DFE)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	348	*(14.8)*	375	356	*(25.0)*	193	359	*(26.1)*	191	330	*(24.6)*
2 years old	784	427	*(18.5)*	307	473	*(68.9)*	219	425	*(21.0)*	220	382	*(26.7)*
3 years old	518	465	*(25.7)*	192	528	*(56.2)*	171	466	*(44.1)*	131	427	*(37.7)*
4 years old	499	490	*(28.1)*	132	531	*(84.9)*	179	462	*(36.8)*	167	491	*(40.5)*
Total, age adjusted	2,586	430	*(13.0)*	1,006	452	*(33.4)*	762	432	*(15.8)*	709	410	*(20.4)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	99.6 u	*(0.21)*	375	99.8 u	*(0.13)*	193	99.4 u	*(0.56)*	191	99.6 u	*(0.44)*
2 years old	784	99.8 u	*(0.09)*	307	99.8 u	*(0.15)*	219	99.9 u	*(0.13)*	220	99.8 u	*(0.21)*
3 years old	518	100.0 u	*(0.00)*	192	100.0 u	*(0.00)*	171	100.0 u	*(0.00)*	131	100.0 u	*(0.00)*
4 years old	499	100.0 u	*(0.00)*	132	100.0 u	*(0.00)*	179	100.0 u	*(0.00)*	167	100.0 u	*(0.00)*
Total, age adjusted	2,586	99.9 u	*(0.06)*	1,006	99.9 u	*(0.05)*	762	99.8 u	*(0.14)*	709	99.8 u	*(0.12)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-14—Folate (mcg DFE): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (µg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	120	185	212	232	263	330	413	465	505	572	*(8.7)*	*(8.7)*	*(8.9)*	*(9.4)*	*(11.9)*	*(17.6)*	*(23.6)*	*(29.5)*	*(42.6)*
2 years old	120	215	249	273	314	402	511	580	633	723	*(13.2)*	*(14.5)*	*(14.0)*	*(12.4)*	*(14.8)*	*(20.0)*	*(30.7)*	*(44.8)*	*(75.1)*
3 years old	120	314	340	358	388	451	526	573	607	662	*(18.1)*	*(19.0)*	*(19.6)*	*(20.9)*	*(24.1)*	*(30.3)*	*(35.6)*	*(40.3)*	*(49.2)*
4 years old	160	316	346	368	402	473	559	613	653	718	*(19.0)*	*(20.2)*	*(21.0)*	*(22.4)*	*(26.1)*	*(32.4)*	*(38.0)*	*(43.0)*	*(52.9)*
Total, age adjusted	–	226	259	283	321	404	509	577	630	722	*(6.6)*	*(6.8)*	*(7.0)*	*(7.6)*	*(9.7)*	*(15.3)*	*(21.8)*	*(28.3)*	*(42.9)*
WIC children																			
1 year old	120	188	214	234	265	334	418	474	519	597	*(12.4)*	*(12.9)*	*(13.2)*	*(13.5)*	*(15.3)*	*(25.6)*	*(40.4)*	*(56.7)*	*(93.8)*
2 years old	120	227	266	294	340	437	558	642	711	840 u	*(20.9)*	*(20.7)*	*(27.2)*	*(38.2)*	*(36.7)*	*(74.3)*	*(127.0)*	*(175.0)*	*(284.0)*
3 years old	120	354	384	405	439	511	598	652	693	761	*(28.7)*	*(31.2)*	*(33.1)*	*(36.7)*	*(48.0)*	*(69.7)*	*(87.3)*	*(102.0)*	*(129.0)*
4 years old	160	301	338	366	410	505	618	691	748	846	*(61.3)*	*(59.9)*	*(58.4)*	*(57.2)*	*(65.9)*	*(98.5)*	*(129.0)*	*(158.0)*	*(215.0)*
Total, age adjusted	–	229	262	286	326	413	529	610	677	800	*(12.6)*	*(13.0)*	*(13.0)*	*(14.0)*	*(20.7)*	*(52.3)*	*(77.8)*	*(91.7)*	*(116.0)*
Income-eligible nonparticipating children																			
1 year old	120	181	212	234	270	345	433	486	524	584	*(25.2)*	*(24.5)*	*(23.3)*	*(22.8)*	*(27.2)*	*(31.9)*	*(38.0)*	*(43.4)*	*(50.2)*
2 years old	120	240	274	298	336	413	500	553	592	655	*(17.4)*	*(17.6)*	*(17.7)*	*(17.7)*	*(19.2)*	*(25.1)*	*(31.1)*	*(36.4)*	*(46.6)*
3 years old	120	312	339	359	390	454	529	575	608	661	*(26.5)*	*(28.7)*	*(30.4)*	*(33.4)*	*(41.0)*	*(52.5)*	*(60.7)*	*(67.3)*	*(78.8)*
4 years old	160	297	324	344	378	451	535	583	615	665	*(24.1)*	*(27.1)*	*(29.1)*	*(31.8)*	*(36.7)*	*(43.9)*	*(49.4)*	*(53.8)*	*(62.1)*
Total, age adjusted	–	231	264	288	327	413	515	577	622	697	*(9.5)*	*(9.8)*	*(10.2)*	*(11.3)*	*(14.8)*	*(20.0)*	*(24.2)*	*(28.2)*	*(36.9)*
Higher-income nonparticipating children																			
1 year old	120	179	204	222	252	315	393	440	475	530	*(15.3)*	*(14.8)*	*(15.0)*	*(16.3)*	*(21.9)*	*(31.6)*	*(39.1)*	*(45.4)*	*(56.6)*
2 years old	120	198	228	251	286	364	458	515	557	625	*(20.1)*	*(21.7)*	*(22.1)*	*(22.6)*	*(26.3)*	*(32.7)*	*(38.3)*	*(42.9)*	*(50.8)*
3 years old	120	290	315	333	361	419	484	523	550	593	*(31.7)*	*(33.2)*	*(34.4)*	*(36.2)*	*(39.5)*	*(43.8)*	*(48.3)*	*(53.1)*	*(63.9)*
4 years old	160	330	357	376	406	471	556	610	651	717	*(27.4)*	*(26.6)*	*(27.3)*	*(30.4)*	*(39.9)*	*(51.6)*	*(59.3)*	*(65.2)*	*(75.5)*
Total, age adjusted	–	218	250	273	309	388	486	549	597	677	*(13.9)*	*(14.1)*	*(14.5)*	*(15.5)*	*(18.9)*	*(25.5)*	*(30.9)*	*(35.7)*	*(44.7)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-15—Niacin (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	12.6	*(0.42)*	375	12.8	*(0.60)*	193	12.6	*(0.79)*	191	12.4	*(0.80)*
2 years old	784	14.3	*(0.54)*	307	15.1	*(0.88)*	219	14.7	*(0.65)*	220	13.3	*(0.80)*
3 years old	518	14.9	*(0.45)*	192	15.6	*(0.98)*	171	15.5	*(0.90)*	131	13.6	*(0.76)*
4 years old	499	16.8	*(0.78)*	132	16.9	*(1.50)*	179	16.9	*(1.09)*	167	16.7	*(1.33)*
Total, age adjusted	2,586	14.6	*(0.32)*	1,006	14.8	*(0.47)*	762	15.0	*(0.43)*	709	14.0	*(0.63)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	99.0	*(0.40)*	375	99.1	*(0.48)*	193	98.4	*(1.07)*	191	99.1	*(0.71)*
2 years old	784	99.7	*(0.20)*	307	99.6	*(0.30)*	219	99.8	*(0.17)*	220	99.7	*(0.32)*
3 years old	518	100.0	*(0.00)*	192	100.0	*(0.00)*	171	100.0	*(0.00)*	131	100.0	*(0.00)*
4 years old	499	100.0	*(0.00)*	132	100.0	*(0.00)*	179	100.0	*(0.06)*	167	100.0	*(0.00)*
Total, age adjusted	2,586	99.7	*(0.11)*	1,006	99.7	*(0.14)*	762	99.6	*(0.27)*	709	99.7	*(0.19)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-16—Niacin (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	5	6.8	7.8	8.5	9.7	12.1	14.9	16.6	18.0	20.2	*(0.34)*	*(0.34)*	*(0.34)*	*(0.34)*	*(0.40)*	*(0.54)*	*(0.67)*	*(0.78)*	*(1.02)*
2 years old	5	8.0	9.1	9.9	11.1	13.6	16.6	18.6	20.1	22.8	*(0.42)*	*(0.43)*	*(0.41)*	*(0.38)*	*(0.44)*	*(0.59)*	*(0.84)*	*(1.11)*	*(1.66)*
3 years old	5	10.1	11.0	11.6	12.6	14.6	16.8	18.2	19.1	20.7	*(0.42)*	*(0.42)*	*(0.42)*	*(0.42)*	*(0.45)*	*(0.52)*	*(0.57)*	*(0.61)*	*(0.68)*
4 years old	6	10.9	11.9	12.6	13.8	16.2	19.1	20.9	22.3	24.4	*(0.67)*	*(0.72)*	*(0.75)*	*(0.76)*	*(0.70)*	*(1.08)*	*(1.43)*	*(1.71)*	*(2.20)*
Total, age adjusted	–	8.3	9.4	10.2	11.4	13.9	17.0	19.1	20.6	23.2	*(0.24)*	*(0.23)*	*(0.22)*	*(0.22)*	*(0.24)*	*(0.39)*	*(0.52)*	*(0.63)*	*(1.00)*
WIC children																			
1 year old	5	6.8	7.9	8.6	9.8	12.2	15.2	17.1	18.5	20.8	*(0.43)*	*(0.42)*	*(0.43)*	*(0.49)*	*(0.63)*	*(0.78)*	*(0.94)*	*(1.10)*	*(1.41)*
2 years old	5	8.1	9.3	10.2	11.6	14.4	17.9	20.1	21.7	24.5	*(0.65)*	*(0.67)*	*(0.69)*	*(0.71)*	*(0.79)*	*(1.06)*	*(1.31)*	*(1.52)*	*(1.90)*
3 years old	5	10.5	11.5	12.2	13.3	15.4	17.7	19.1	20.1	21.6	*(0.68)*	*(0.67)*	*(0.69)*	*(0.83)*	*(1.27)*	*(1.35)*	*(1.21)*	*(1.20)*	*(1.36)*
4 years old	6	10.7	11.8	12.6	13.8	16.4	19.5	21.3	22.6	24.7	*(1.14)*	*(1.24)*	*(1.31)*	*(1.42)*	*(1.58)*	*(1.71)*	*(1.77)*	*(1.82)*	*(1.93)*
Total, age adjusted	–	8.0	9.2	10.1	11.4	14.2	17.5	19.5	21.1	23.5	*(0.31)*	*(0.33)*	*(0.35)*	*(0.37)*	*(0.43)*	*(0.58)*	*(0.72)*	*(0.84)*	*(1.07)*
Income-eligible nonparticipating children																			
1 year old	5	6.5	7.7	8.5	9.8	12.3	15.1	16.7	17.7	19.4	*(0.78)*	*(0.79)*	*(0.78)*	*(0.77)*	*(0.78)*	*(0.91)*	*(1.01)*	*(1.10)*	*(1.25)*
2 years old	5	8.7	9.9	10.7	11.9	14.4	17.1	18.7	19.7	21.4	*(0.69)*	*(0.68)*	*(0.67)*	*(0.66)*	*(0.67)*	*(0.75)*	*(0.81)*	*(0.86)*	*(0.96)*
3 years old	5	10.1	11.1	11.8	12.8	15.1	17.7	19.2	20.4	22.2	*(0.72)*	*(0.69)*	*(0.69)*	*(0.72)*	*(0.88)*	*(1.08)*	*(1.23)*	*(1.35)*	*(1.58)*
4 years old	6	10.7	11.8	12.7	13.9	16.6	19.5	21.1	22.3	24.2	*(1.23)*	*(1.19)*	*(1.17)*	*(1.14)*	*(1.13)*	*(1.20)*	*(1.30)*	*(1.39)*	*(1.56)*
Total, age adjusted	–	8.4	9.6	10.5	11.9	14.6	17.7	19.5	20.9	23.0	*(0.56)*	*(0.56)*	*(0.48)*	*(0.46)*	*(0.66)*	*(0.56)*	*(0.69)*	*(0.77)*	*(0.81)*
Higher-income nonparticipating children																			
1 year old	5	6.7	7.6	8.3	9.4	11.7	14.6	16.5	18.0	20.6	*(0.51)*	*(0.46)*	*(0.46)*	*(0.49)*	*(0.65)*	*(1.03)*	*(1.39)*	*(1.72)*	*(2.41)*
2 years old	5	7.8	8.8	9.4	10.4	12.5	15.1	17.0	18.5	21.3	*(0.69)*	*(0.65)*	*(0.62)*	*(0.58)*	*(0.58)*	*(0.85)*	*(1.21)*	*(1.57)*	*(2.37)*
3 years old	5	9.5	10.3	10.9	11.7	13.4	15.3	16.4	17.3	18.6	*(0.77)*	*(0.77)*	*(0.75)*	*(0.71)*	*(0.76)*	*(0.98)*	*(1.07)*	*(1.09)*	*(1.13)*
4 years old	6	11.2	12.1	12.7	13.6	15.9	18.9	20.7	22.1	24.5	*(0.60)*	*(0.59)*	*(0.59)*	*(0.64)*	*(0.96)*	*(1.72)*	*(2.35)*	*(2.89)*	*(3.92)*
Total, age adjusted	–	8.2	9.2	9.9	11.1	13.3	16.1	18.0	19.4	21.9	*(0.37)*	*(0.36)*	*(0.37)*	*(0.38)*	*(0.44)*	*(0.63)*	*(0.99)*	*(1.42)*	*(2.40)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-17—Riboflavin (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	2.03	*(0.063)*	375	1.96	*(0.075)*	193	2.06	*(0.118)*	191	2.09	*(0.117)*
2 years old	784	1.95	*(0.068)*	307	2.01	*(0.111)*	219	1.98	*(0.094)*	220	1.89	*(0.094)*
3 years old	518	1.90	*(0.076)*	192	2.00	*(0.115)*	171	1.85	*(0.134)*	131	1.83	*(0.135)*
4 years old	499	1.98	*(0.076)*	132	1.89	*(0.139)*	179	1.99	*(0.134)*	167	2.02	*(0.132)*
Total, age adjusted	2,586	1.97	*(0.044)*	1,006	1.97	*(0.060)*	762	1.96	*(0.072)*	709	1.96	*(0.076)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	100.0 u	*(0.00)*	375	100.0 u	*(0.00)*	193	100.0 u	*(0.05)*	191	100.0 u	*(0.00)*
2 years old	784	100.0 u	*(0.00)*	307	100.0 u	*(0.00)*	219	100.0 u	*(0.00)*	220	100.0 u	*(0.00)*
3 years old	518	100.0 u	*(0.00)*	192	100.0 u	*(0.00)*	171	100.0 u	*(0.00)*	131	100.0 u	*(0.00)*
4 years old	499	100.0 u	*(0.00)*	132	100.0 u	*(0.00)*	179	100.0 u	*(0.00)*	167	100.0 u	*(0.00)*
Total, age adjusted	2,586	100.0 u	*(0.00)*	1,006	100.0 u	*(0.00)*	762	100.0 u	*(0.01)*	709	100.0 u	*(0.00)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-18—Riboflavin (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	0.4	1.16	1.33	1.45	1.62	1.97	2.37	2.61	2.79	3.09	*(0.05)*	*(0.05)*	*(0.05)*	*(0.05)*	*(0.06)*	*(0.08)*	*(0.09)*	*(0.10)*	*(0.13)*
2 years old	0.4	1.08	1.24	1.35	1.53	1.90	2.30	2.54	2.71	3.00	*(0.05)*	*(0.05)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.09)*	*(0.11)*	*(0.12)*	*(0.14)*
3 years old	0.4	1.17	1.30	1.40	1.55	1.85	2.20	2.40	2.55	2.77	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*	*(0.09)*	*(0.10)*	*(0.11)*	*(0.13)*
4 years old	0.5	1.26	1.38	1.47	1.62	1.92	2.28	2.50	2.66	2.93	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.09)*	*(0.12)*	*(0.14)*	*(0.20)*
Total, age adjusted	–	1.09	1.25	1.37	1.54	1.90	2.31	2.56	2.75	3.06	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.10)*
WIC children																			
1 year old	0.4	1.09	1.25	1.36	1.54	1.91	2.33	2.57	2.75	3.02	*(0.06)*	*(0.06)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.09)*	*(0.10)*	*(0.11)*	*(0.13)*
2 years old	0.4	1.09	1.26	1.38	1.58	1.97	2.37	2.61	2.78	3.09	*(0.08)*	*(0.08)*	*(0.09)*	*(0.09)*	*(0.11)*	*(0.13)*	*(0.16)*	*(0.18)*	*(0.23)*
3 years old	0.4	1.26	1.40	1.50	1.65	1.95	2.29	2.50	2.65	2.89	*(0.09)*	*(0.09)*	*(0.09)*	*(0.10)*	*(0.12)*	*(0.14)*	*(0.16)*	*(0.18)*	*(0.21)*
4 years old	0.5	1.17	1.29	1.38	1.52	1.83	2.20	2.42	2.58	2.83	*(0.12)*	*(0.11)*	*(0.11)*	*(0.12)*	*(0.16)*	*(0.16)*	*(0.17)*	*(0.18)*	*(0.20)*
Total, age adjusted	–	1.08	1.25	1.36	1.54	1.90	2.32	2.58	2.77	3.08	*(0.05)*	*(0.05)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.09)*	*(0.11)*
Income-eligible nonparticipating children																			
1 year old	0.4	1.17	1.35	1.47	1.65	1.98	2.37	2.64	2.85	3.23	*(0.11)*	*(0.09)*	*(0.08)*	*(0.08)*	*(0.10)*	*(0.15)*	*(0.18)*	*(0.21)*	*(0.28)*
2 years old	0.4	1.13	1.30	1.42	1.60	1.94	2.32	2.55	2.71	2.97	*(0.08)*	*(0.08)*	*(0.09)*	*(0.09)*	*(0.10)*	*(0.13)*	*(0.14)*	*(0.15)*	*(0.16)*
3 years old	0.4	1.03	1.19	1.30	1.49	1.84	2.19	2.37	2.50	2.71	*(0.13)*	*(0.13)*	*(0.13)*	*(0.13)*	*(0.13)*	*(0.14)*	*(0.16)*	*(0.17)*	*(0.20)*
4 years old	0.5	1.20	1.35	1.45	1.61	1.94	2.31	2.52	2.68	2.93	*(0.14)*	*(0.14)*	*(0.14)*	*(0.13)*	*(0.13)*	*(0.18)*	*(0.20)*	*(0.21)*	*(0.23)*
Total, age adjusted	–	1.05	1.22	1.35	1.53	1.90	2.32	2.58	2.77	3.08	*(0.06)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.09)*	*(0.10)*	*(0.12)*
Higher-income nonparticipating children																			
1 year old	0.4	1.23	1.41	1.52	1.70	2.04	2.41	2.65	2.82	3.11	*(0.11)*	*(0.11)*	*(0.10)*	*(0.10)*	*(0.10)*	*(0.15)*	*(0.18)*	*(0.20)*	*(0.24)*
2 years old	0.4	1.06	1.20	1.30	1.47	1.82	2.23	2.48	2.67	2.96	*(0.09)*	*(0.09)*	*(0.09)*	*(0.09)*	*(0.10)*	*(0.11)*	*(0.13)*	*(0.15)*	*(0.19)*
3 years old	0.4	1.17	1.28	1.36	1.49	1.77	2.11	2.31	2.46	2.70	*(0.08)*	*(0.08)*	*(0.09)*	*(0.10)*	*(0.12)*	*(0.16)*	*(0.20)*	*(0.22)*	*(0.27)*
4 years old	0.5	1.33	1.45	1.53	1.67	1.94	2.29	2.51	2.68	2.98	*(0.07)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.10)*	*(0.16)*	*(0.23)*	*(0.30)*	*(0.43)*
Total, age adjusted	–	1.13	1.28	1.38	1.54	1.88	2.28	2.54	2.74	3.08	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.09)*	*(0.12)*	*(0.15)*	*(0.22)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-19—Thiamin (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	1.15	*(0.037)*	375	1.15	*(0.051)*	193	1.16	*(0.061)*	191	1.13	*(0.072)*
2 years old	784	1.24	*(0.041)*	307	1.33	*(0.068)*	219	1.28	*(0.052)*	220	1.15	*(0.067)*
3 years old	518	1.28	*(0.046)*	192	1.37	*(0.082)*	171	1.27	*(0.086)*	131	1.20	*(0.063)*
4 years old	499	1.38	*(0.045)*	132	1.38	*(0.113)*	179	1.39	*(0.081)*	167	1.38	*(0.108)*
Total, age adjusted	2,586	1.26	*(0.024)*	1,006	1.29	*(0.037)*	762	1.28	*(0.036)*	709	1.22	*(0.050)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	99.8 u	*(0.13)*	375	99.8 u	*(0.14)*	193	99.7 u	*(0.37)*	191	99.9 u	*(0.25)*
2 years old	784	100.0 u	*(0.00)*	307	100.0 u	*(0.12)*	219	100.0 u	*(0.00)*	220	100.0 u	*(0.00)*
3 years old	518	100.0 u	*(0.00)*	192	100.0 u	*(0.00)*	171	100.0 u	*(0.00)*	131	100.0 u	*(0.00)*
4 years old	499	100.0 u	*(0.00)*	132	100.0 u	*(0.00)*	179	100.0 u	*(0.00)*	167	100.0 u	*(0.00)*
Total, age adjusted	2,586	100.0 u	*(0.03)*	1,006	99.9 u	*(0.05)*	762	99.9 u	*(0.09)*	709	100.0 u	*(0.06)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-20—Thiamin (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	0.4	0.67	0.76	0.82	0.91	1.11	1.34	1.48	1.59	1.76	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.03)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.08)*
2 years old	0.4	0.74	0.83	0.89	0.99	1.20	1.44	1.59	1.71	1.89	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.05)*	*(0.08)*	*(0.10)*	*(0.15)*
3 years old	0.4	0.94	1.01	1.05	1.12	1.26	1.41	1.50	1.56	1.66	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.09)*
4 years old	0.5	0.93	1.01	1.07	1.16	1.34	1.56	1.70	1.80	1.96	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.07)*	*(0.08)*	*(0.11)*
Total, age adjusted	–	0.75	0.84	0.91	1.01	1.22	1.47	1.62	1.73	1.92	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.05)*	*(0.09)*
WIC children																			
1 year old	0.4	0.65	0.75	0.81	0.91	1.11	1.35	1.50	1.61	1.79	*(0.04)*	*(0.05)*	*(0.05)*	*(0.05)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.11)*
2 years old	0.4	0.77	0.88	0.95	1.06	1.28	1.54	1.71	1.83	2.03	*(0.05)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.08)*	*(0.10)*	*(0.11)*	*(0.14)*
3 years old	0.4	1.00	1.07	1.12	1.20	1.36	1.52	1.62	1.68	1.78	*(0.06)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.09)*	*(0.09)*	*(0.09)*	*(0.09)*	*(0.10)*
4 years old	0.5	0.89	0.97	1.03	1.13	1.33	1.58	1.73	1.84	2.02	*(0.09)*	*(0.09)*	*(0.09)*	*(0.10)*	*(0.11)*	*(0.13)*	*(0.14)*	*(0.15)*	*(0.17)*
Total, age adjusted	–	0.74	0.84	0.91	1.02	1.25	1.51	1.67	1.79	1.98	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.05)*	*(0.06)*
Income-eligible nonparticipating children																			
1 year old	0.4	0.67	0.76	0.83	0.93	1.12	1.34	1.48	1.59	1.77	*(0.07)*	*(0.07)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.10)*	*(0.13)*
2 years old	0.4	0.80	0.89	0.95	1.05	1.26	1.48	1.60	1.69	1.82	*(0.04)*	*(0.05)*	*(0.05)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.07)*	*(0.07)*	*(0.08)*
3 years old	0.4	0.91	0.98	1.03	1.10	1.25	1.42	1.52	1.59	1.71	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.10)*	*(0.11)*	*(0.12)*	*(0.14)*
4 years old	0.5	0.92	1.01	1.08	1.17	1.37	1.59	1.71	1.80	1.94	*(0.07)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.08)*	*(0.09)*	*(0.10)*	*(0.10)*	*(0.11)*
Total, age adjusted	–	0.76	0.86	0.93	1.03	1.24	1.49	1.63	1.74	1.92	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.05)*	*(0.07)*
Higher-income nonparticipating children																			
1 year old	0.4	0.69	0.76	0.80	0.88	1.08	1.33	1.48	1.59	1.77	*(0.05)*	*(0.05)*	*(0.05)*	*(0.06)*	*(0.06)*	*(0.10)*	*(0.12)*	*(0.13)*	*(0.18)*
2 years old	0.4	0.70	0.77	0.83	0.92	1.10	1.34	1.48	1.59	1.78	*(0.08)*	*(0.07)*	*(0.07)*	*(0.05)*	*(0.08)*	*(0.08)*	*(0.09)*	*(0.11)*	*(0.16)*
3 years old	0.4	0.92	0.97	1.01	1.07	1.19	1.32	1.39	1.44	1.52	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.08)*
4 years old	0.5	0.94	1.00	1.05	1.14	1.32	1.56	1.70	1.82	2.01	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.07)*	*(0.14)*	*(0.20)*	*(0.25)*	*(0.37)*
Total, age adjusted	–	0.75	0.83	0.88	0.97	1.17	1.41	1.56	1.67	1.85	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.06)*	*(0.08)*	*(0.10)*	*(0.14)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-21—Calcium (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	1042	*(43.3)*	375	985	*(42.6)*	193	1063	*(81.0)*	191	1096	*(69.3)*
2 years old	784	941	*(35.5)*	307	914	*(55.8)*	219	944	*(62.5)*	220	962	*(55.3)*
3 years old	518	912	*(51.6)*	192	950	*(68.3)*	171	875	*(71.7)*	131	904	*(91.8)*
4 years old	499	910	*(37.2)*	132	828	*(76.7)*	179	933	*(69.9)*	167	931	*(58.6)*
Total, age adjusted	2,586	953	*(26.5)*	1,006	929	*(38.6)*	762	951	*(43.0)*	709	971	*(39.6)*
	Mean Usual Intake as a Percent of Adequate Intake (AI)[1]											
Children												
1 year old	785	208.4	*(8.66)*	375	196.9	*(8.52)*	193	212.6	*(16.20)*	191	219.1	*(13.86)*
2 years old	784	188.3	*(7.10)*	307	182.8	*(11.16)*	219	188.8	*(12.50)*	220	192.3	*(11.06)*
3 years old	518	182.3	*(10.31)*	192	190.0	*(13.66)*	171	174.9	*(14.33)*	131	180.8	*(18.36)*
4 years old	499	113.8	*(4.66)*	132	103.5	*(9.59)*	179	116.6	*(8.73)*	167	116.4	*(7.33)*
Total, age adjusted	2,586	172.8	*(3.97)*	1,006	167.8	*(5.45)*	762	172.8	*(6.59)*	709	176.7	*(6.62)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

1 Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-22—Calcium (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AI (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	500	526	621	688	792	1006	1251	1399	1506	1679	*(38.7)*	*(38.8)*	*(37.0)*	*(35.7)*	*(46.6)*	*(54.9)*	*(61.8)*	*(69.7)*	*(87.4)*
2 years old	500	456	543	606	706	913	1145	1280	1376	1524	*(27.0)*	*(29.3)*	*(31.0)*	*(33.7)*	*(38.5)*	*(41.9)*	*(43.3)*	*(44.2)*	*(46.0)*
3 years old	500	455	532	588	677	864	1093	1238	1348	1530	*(36.1)*	*(37.5)*	*(38.5)*	*(40.2)*	*(46.0)*	*(60.5)*	*(74.7)*	*(87.8)*	*(114.0)*
4 years old	800	493	565	616	698	873	1081	1210	1305	1456	*(23.6)*	*(23.4)*	*(24.2)*	*(27.0)*	*(36.6)*	*(50.2)*	*(59.0)*	*(65.8)*	*(78.3)*
Total, age adjusted	–	466	552	613	707	905	1152	1307	1420	1598	*(21.5)*	*(24.8)*	*(23.7)*	*(20.5)*	*(29.9)*	*(32.2)*	*(43.3)*	*(54.1)*	*(66.9)*
WIC children																			
1 year old	500	485	572	636	737	949	1194	1339	1443	1605	*(32.9)*	*(32.5)*	*(33.0)*	*(35.1)*	*(42.5)*	*(53.1)*	*(60.7)*	*(67.0)*	*(78.9)*
2 years old	500	446	530	591	688	887	1110	1240	1332	1474	*(38.8)*	*(43.3)*	*(46.6)*	*(51.5)*	*(59.3)*	*(65.3)*	*(68.9)*	*(72.3)*	*(79.8)*
3 years old	500	474	558	618	712	907	1139	1285	1394	1573	*(68.6)*	*(77.0)*	*(77.4)*	*(70.5)*	*(65.2)*	*(102.0)*	*(118.0)*	*(125.0)*	*(149.0)*
4 years old	800	434	491	534	605	769	986	1129	1239	1423	*(42.2)*	*(44.3)*	*(46.5)*	*(51.2)*	*(65.8)*	*(95.3)*	*(123.0)*	*(147.0)*	*(196.0)*
Total, age adjusted	–	442	523	583	680	888	1133	1281	1389	1558	*(34.1)*	*(40.0)*	*(41.6)*	*(40.8)*	*(38.1)*	*(49.6)*	*(56.6)*	*(60.2)*	*(70.0)*
Income-eligible nonparticipating children																			
1 year old	500	517	605	672	779	1011	1291	1463	1588	1788	*(49.0)*	*(55.6)*	*(60.3)*	*(64.6)*	*(73.3)*	*(99.8)*	*(121.0)*	*(143.0)*	*(197.0)*
2 years old	500	441	531	597	701	915	1155	1295	1393	1545	*(46.6)*	*(47.1)*	*(48.5)*	*(52.2)*	*(63.4)*	*(78.5)*	*(88.3)*	*(95.8)*	*(109.0)*
3 years old	500	382	461	520	616	827	1081	1237	1351	1532	*(56.4)*	*(58.3)*	*(59.7)*	*(62.1)*	*(69.0)*	*(82.6)*	*(96.2)*	*(109.0)*	*(137.0)*
4 years old	800	488	567	623	710	889	1106	1245	1351	1527	*(53.2)*	*(48.3)*	*(46.2)*	*(46.6)*	*(60.9)*	*(91.7)*	*(117.0)*	*(139.0)*	*(183.0)*
Total, age adjusted	–	436	535	600	695	891	1154	1325	1450	1646	*(32.9)*	*(31.3)*	*(33.9)*	*(36.1)*	*(42.8)*	*(52.4)*	*(62.1)*	*(70.5)*	*(88.9)*
Higher-income nonparticipating children																			
1 year old	500	572	674	746	857	1078	1314	1447	1540	1680	*(60.6)*	*(57.6)*	*(55.8)*	*(55.2)*	*(62.9)*	*(83.6)*	*(106.0)*	*(124.0)*	*(157.0)*
2 years old	500	468	558	622	724	934	1169	1305	1401	1550	*(51.2)*	*(53.0)*	*(54.2)*	*(55.9)*	*(58.7)*	*(61.4)*	*(63.6)*	*(66.0)*	*(71.3)*
3 years old	500	478	543	592	672	850	1077	1222	1332	1513	*(48.4)*	*(53.9)*	*(56.4)*	*(59.1)*	*(76.3)*	*(116.0)*	*(144.0)*	*(172.0)*	*(242.0)*
4 years old	800	526	598	651	733	905	1100	1216	1298	1427	*(32.3)*	*(35.4)*	*(38.7)*	*(45.5)*	*(61.0)*	*(77.4)*	*(86.5)*	*(92.9)*	*(105.0)*
Total, age adjusted	–	486	570	631	728	935	1175	1318	1420	1582	*(30.9)*	*(36.1)*	*(35.4)*	*(31.4)*	*(41.5)*	*(49.9)*	*(65.3)*	*(77.8)*	*(92.3)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-23—Iron (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	10.3	*(0.40)*	375	11.0	*(0.58)*	193	10.0	*(0.59)*	191	9.8	*(0.76)*
2 years old	784	11.2	*(0.36)*	307	12.6	*(0.75)*	219	11.1	*(0.50)*	220	** 10.1	*(0.53)*
3 years old	518	11.9	*(0.55)*	192	13.4	*(1.10)*	171	12.0	*(0.98)*	131	* 10.7	*(0.65)*
4 years old	499	13.1	*(0.50)*	132	13.9	*(1.16)*	179	13.0	*(0.96)*	167	12.7	*(0.72)*
Total, age adjusted	2,586	11.6	*(0.24)*	1,006	12.5	*(0.50)*	762	11.6	*(0.35)*	709	* 10.9	*(0.38)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	99.7	*(0.21)*	375	99.8	*(0.13)*	193	99.6	*(0.52)*	191	99.6	*(0.32)*
2 years old	784	100.0	*(0.12)*	307	100.0	*(0.14)*	219	100.0	*(0.00)*	220	99.9	*(0.17)*
3 years old	518	100.0	*(0.00)*	192	100.0	*(0.00)*	171	100.0	*(0.00)*	131	100.0	*(0.00)*
4 years old	499	100.0	*(0.00)*	132	100.0	*(0.00)*	179	100.0	*(0.00)*	167	100.0	*(0.00)*
Total, age adjusted	2,586	99.9	*(0.06)*	1,006	99.9	*(0.05)*	762	99.9	*(0.13)*	709	99.9	*(0.09)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-24—Iron (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	3.0	5.1	5.9	6.5	7.5	9.6	12.3	14.2	15.7	18.1	*(0.27)*	*(0.34)*	*(0.34)*	*(0.29)*	*(0.37)*	*(0.51)*	*(0.71)*	*(0.91)*	*(1.27)*
2 years old	3.0	6.2	7.1	7.8	8.7	10.8	13.2	14.6	15.7	17.5	*(0.36)*	*(0.38)*	*(0.38)*	*(0.35)*	*(0.38)*	*(0.55)*	*(0.64)*	*(0.71)*	*(0.86)*
3 years old	3.0	7.6	8.3	8.8	9.7	11.5	13.7	15.0	16.0	17.7	*(0.38)*	*(0.39)*	*(0.40)*	*(0.42)*	*(0.53)*	*(0.69)*	*(0.79)*	*(0.89)*	*(1.17)*
4 years old	4.1	9.0	9.7	10.2	11.0	12.7	14.8	16.0	16.9	18.4	*(0.37)*	*(0.38)*	*(0.39)*	*(0.42)*	*(0.50)*	*(0.60)*	*(0.68)*	*(0.75)*	*(0.90)*
Total, age adjusted	–	6.2	7.1	7.7	8.7	11.0	13.8	15.5	16.9	19.1	*(0.18)*	*(0.16)*	*(0.17)*	*(0.18)*	*(0.21)*	*(0.34)*	*(0.42)*	*(0.51)*	*(0.70)*
WIC children																			
1 year old	3.0	5.2	6.0	6.7	7.8	10.2	13.3	15.4	16.9	19.4	*(0.34)*	*(0.36)*	*(0.38)*	*(0.42)*	*(0.54)*	*(0.76)*	*(0.96)*	*(1.15)*	*(1.52)*
2 years old	3.0	6.7	7.7	8.5	9.6	12.0	14.9	16.8	18.2	20.6	*(0.51)*	*(0.52)*	*(0.53)*	*(0.56)*	*(0.65)*	*(0.89)*	*(1.14)*	*(1.39)*	*(1.89)*
3 years old	3.0	8.5	9.4	10.0	11.0	13.0	15.4	16.9	18.0	19.8	*(0.63)*	*(0.68)*	*(0.73)*	*(0.82)*	*(1.03)*	*(1.36)*	*(1.60)*	*(1.80)*	*(2.15)*
4 years old	4.1	9.1	9.9	10.4	11.3	13.4	15.9	17.5	18.7	20.7	*(0.86)*	*(1.00)*	*(1.07)*	*(1.13)*	*(1.15)*	*(1.30)*	*(1.53)*	*(1.76)*	*(2.22)*
Total, age adjusted	–	6.3	7.3	8.0	9.2	11.7	14.9	17.1	18.7	21.4	*(0.28)*	*(0.32)*	*(0.31)*	*(0.34)*	*(0.61)*	*(0.72)*	*(0.86)*	*(1.03)*	*(1.34)*
Income-eligible nonparticipating children																			
1 year old	3.0	5.2	6.1	6.7	7.6	9.6	11.9	13.4	14.5	16.4	*(0.64)*	*(0.60)*	*(0.62)*	*(0.58)*	*(0.59)*	*(0.75)*	*(0.89)*	*(1.01)*	*(1.24)*
2 years old	3.0	6.6	7.5	8.1	9.0	10.9	12.9	14.0	14.8	16.0	*(0.57)*	*(0.54)*	*(0.52)*	*(0.48)*	*(0.45)*	*(0.53)*	*(0.65)*	*(0.76)*	*(0.97)*
3 years old	3.0	7.1	7.9	8.5	9.5	11.5	14.0	15.6	16.7	18.6	*(0.60)*	*(0.63)*	*(0.65)*	*(0.68)*	*(0.87)*	*(1.19)*	*(1.44)*	*(1.72)*	*(2.46)*
4 years old	4.1	8.7	9.5	10.1	11.0	12.8	14.8	16.0	16.9	18.2	*(0.86)*	*(0.85)*	*(0.85)*	*(0.87)*	*(0.94)*	*(1.08)*	*(1.19)*	*(1.28)*	*(1.45)*
Total, age adjusted	–	6.1	7.1	7.8	8.9	11.1	13.8	15.5	16.8	18.9	*(0.30)*	*(0.29)*	*(0.29)*	*(0.29)*	*(0.32)*	*(0.42)*	*(0.53)*	*(0.64)*	*(0.87)*
Higher-income nonparticipating children																			
1 year old	3.0	4.8	5.6	6.1	7.1	9.1	11.7	13.5	14.9	17.4	*(0.35)*	*(0.36)*	*(0.38)*	*(0.43)*	*(0.59)*	*(0.95)*	*(1.31)*	*(1.67)*	*(2.42)*
2 years old	3.0	5.9	6.8	7.3	8.2	9.9	* 11.8	* 12.9	* 13.8	15.2	*(0.60)*	*(0.58)*	*(0.56)*	*(0.53)*	*(0.52)*	*(0.59)*	*(0.67)*	*(0.74)*	*(0.90)*
3 years old	3.0	7.1	7.7	8.2	8.9	10.4	12.2	13.3	14.0	15.3	*(0.55)*	*(0.58)*	*(0.60)*	*(0.63)*	*(0.71)*	*(0.79)*	*(0.79)*	*(0.78)*	*(0.87)*
4 years old	4.1	9.0	9.6	10.1	10.8	12.4	14.2	15.3	16.2	17.6	*(0.49)*	*(0.52)*	*(0.53)*	*(0.56)*	*(0.67)*	*(0.87)*	*(1.03)*	*(1.18)*	*(1.46)*
Total, age adjusted	–	6.0	6.8	7.4	8.3	10.3	12.8	14.4	15.6	17.6	*(0.34)*	*(0.31)*	*(0.30)*	*(0.32)*	*(0.39)*	*(0.48)*	*(0.57)*	*(0.68)*	*(0.91)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-25—Magnesium (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	188	*(5.2)*	375	188	*(6.3)*	193	189	*(8.8)*	191	190	*(9.3)*
2 years old	784	193	*(5.8)*	307	197	*(9.2)*	219	196	*(7.4)*	220	185	*(9.2)*
3 years old	518	201	*(7.6)*	192	214	*(11.3)*	171	191	*(11.2)*	131	198	*(13.2)*
4 years old	499	205	*(5.2)*	132	198	*(15.0)*	179	204	*(11.9)*	167	207	*(6.7)*
Total, age adjusted	2,586	197	*(3.7)*	1,006	198	*(5.3)*	762	196	*(5.3)*	709	195	*(5.7)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	99.9 u	*(0.13)*	375	99.8 u	*(0.20)*	193	99.9 u	*(0.19)*	191	99.9 u	*(0.21)*
2 years old	784	100.0 u	*(0.00)*	307	100.0 u	*(0.12)*	219	100.0 u	*(0.00)*	220	100.0 u	*(0.00)*
3 years old	518	100.0 u	*(0.08)*	192	99.9 u	*(0.18)*	171	99.9 u	*(0.22)*	131	100.0 u	*(0.00)*
4 years old	499	98.8 u	*(0.59)*	132	97.7 u	*(1.90)*	179	98.0 u	*(1.96)*	167	99.5 u	*(0.28)*
Total, age adjusted	2,586	99.7 u	*(0.16)*	1,006	99.3 u	*(0.49)*	762	99.4 u	*(0.51)*	709	99.8 u	*(0.09)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-26—Magnesium (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	65	117	132	141	156	184	216	236	250	273	*(5.19)*	*(4.84)*	*(4.69)*	*(4.64)*	*(5.13)*	*(6.25)*	*(7.04)*	*(7.66)*	*(8.82)*
2 years old	65	119	133	143	158	189	223	242	257	280	*(4.63)*	*(4.70)*	*(4.77)*	*(4.97)*	*(5.69)*	*(6.65)*	*(7.65)*	*(8.85)*	*(12.10)*
3 years old	65	121	136	147	163	196	234	256	273	299	*(7.90)*	*(8.67)*	*(8.70)*	*(8.08)*	*(7.20)*	*(9.74)*	*(11.00)*	*(11.60)*	*(13.50)*
4 years old	110	131	144	154	169	200	236	257	272	297	*(5.57)*	*(5.72)*	*(5.55)*	*(5.09)*	*(4.88)*	*(6.55)*	*(8.25)*	*(9.42)*	*(10.90)*
Total, age adjusted	–	119	134	144	160	191	228	250	266	292	*(3.23)*	*(3.27)*	*(3.31)*	*(3.28)*	*(3.49)*	*(4.55)*	*(5.45)*	*(6.04)*	*(7.38)*
WIC children																			
1 year old	65	115	129	139	155	184	217	236	249	271	*(6.51)*	*(6.09)*	*(6.00)*	*(5.99)*	*(6.18)*	*(7.12)*	*(8.08)*	*(8.93)*	*(10.60)*
2 years old	65	117	132	143	159	193	230	252	267	291	*(7.32)*	*(7.76)*	*(8.10)*	*(8.63)*	*(9.53)*	*(10.30)*	*(11.00)*	*(11.60)*	*(13.00)*
3 years old	65	127	143	154	171	206	250	277	296	327	*(10.80)*	*(13.50)*	*(13.70)*	*(10.30)*	*(13.20)*	*(15.70)*	*(21.10)*	*(27.00)*	*(31.30)*
4 years old	110	122	134	143	156	188	230	257	278	311	*(11.30)*	*(11.40)*	*(12.00)*	*(13.40)*	*(15.80)*	*(17.70)*	*(19.80)*	*(21.80)*	*(25.10)*
Total, age adjusted	–	116	131	142	158	192	231	255	273	302	*(4.62)*	*(4.65)*	*(4.91)*	*(5.18)*	*(5.44)*	*(6.12)*	*(7.26)*	*(8.22)*	*(10.10)*
Income-eligible nonparticipating children																			
1 year old	65	114	129	139	154	183	218	241	259	286	*(8.55)*	*(7.71)*	*(7.76)*	*(8.17)*	*(8.73)*	*(12.30)*	*(14.20)*	*(16.80)*	*(20.00)*
2 years old	65	126	140	150	164	194	225	244	256	275	*(6.85)*	*(7.26)*	*(7.34)*	*(7.19)*	*(7.64)*	*(10.40)*	*(11.80)*	*(12.50)*	*(13.20)*
3 years old	65	110	125	135	152	186	225	248	265	291	*(11.10)*	*(10.80)*	*(10.70)*	*(10.60)*	*(11.10)*	*(13.10)*	*(14.50)*	*(15.80)*	*(18.40)*
4 years old	110	125	140	150	165	198	237	260	277	303	*(14.20)*	*(13.00)*	*(12.00)*	*(11.20)*	*(12.80)*	*(14.70)*	*(16.00)*	*(17.40)*	*(19.90)*
Total, age adjusted	–	116	131	141	157	190	228	251	268	294	*(4.66)*	*(4.61)*	*(4.66)*	*(4.86)*	*(5.40)*	*(6.37)*	*(7.43)*	*(8.27)*	*(9.49)*
Higher-income nonparticipating children																			
1 year old	65	122	136	146	160	186	216	234	247	270	*(11.20)*	*(8.86)*	*(7.85)*	*(7.60)*	*(8.97)*	*(11.20)*	*(12.90)*	*(14.30)*	*(17.00)*
2 years old	65	117	130	139	153	181	213	231	244	263	*(8.26)*	*(8.53)*	*(8.73)*	*(9.05)*	*(9.72)*	*(10.40)*	*(11.20)*	*(12.10)*	*(13.90)*
3 years old	65	120	134	144	161	196	230	249	263	286	*(9.98)*	*(10.80)*	*(11.20)*	*(11.70)*	*(12.80)*	*(14.60)*	*(16.80)*	*(19.10)*	*(24.50)*
4 years old	110	140	153	162	176	205	235	253	265	284	*(5.70)*	*(5.73)*	*(5.87)*	*(6.24)*	*(7.31)*	*(8.60)*	*(9.35)*	*(9.91)*	*(10.80)*
Total, age adjusted	–	122	135	145	160	191	225	245	259	280	*(6.03)*	*(6.17)*	*(6.10)*	*(5.71)*	*(5.73)*	*(7.85)*	*(8.67)*	*(8.94)*	*(9.80)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-27—Phosphorus (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	1083	*(35.1)*	375	1047	*(42.3)*	193	1123	*(65.9)*	191	1107	*(60.1)*
2 years old	784	1057	*(29.2)*	307	1050	*(50.7)*	219	1086	*(47.4)*	220	1047	*(50.6)*
3 years old	518	1074	*(41.9)*	192	1126	*(71.0)*	171	1036	*(54.4)*	131	1044	*(78.6)*
4 years old	499	1092	*(32.0)*	132	1031	*(62.7)*	179	1141	*(71.8)*	167	1085	*(39.6)*
Total, age adjusted	2,586	1076	*(20.4)*	1,006	1063	*(34.3)*	762	1096	*(33.8)*	709	1070	*(31.9)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	99.6 u	*(0.22)*	375	99.5 u	*(0.29)*	193	99.7 u	*(0.50)*	191	99.8 u	*(0.32)*
2 years old	784	99.9 u	*(0.10)*	307	99.8 u	*(0.20)*	219	99.9 u	*(0.15)*	220	99.9 u	*(0.23)*
3 years old	518	100.0 u	*(0.13)*	192	99.8 u	*(0.20)*	171	99.9 u	*(0.20)*	131	100.0 u	*(0.00)*
4 years old	499	99.9 u	*(0.16)*	132	99.8 u	*(0.32)*	179	99.8 u	*(0.34)*	167	100.0 u	*(0.15)*
Total, age adjusted	2,586	99.8 u	*(0.08)*	1,006	99.7 u	*(0.13)*	762	99.8 u	*(0.16)*	709	99.9 u	*(0.10)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-28—Phosphorus (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	380	621	711	773	868	1054	1265	1393	1488	1642	*(28.7)*	*(27.5)*	*(27.7)*	*(28.7)*	*(32.3)*	*(42.2)*	*(49.3)*	*(55.4)*	*(68.9)*
2 years old	380	629	708	765	853	1034	1236	1353	1435	1561	*(24.0)*	*(26.0)*	*(27.9)*	*(30.6)*	*(34.0)*	*(33.6)*	*(34.3)*	*(37.4)*	*(47.3)*
3 years old	380	665	741	795	877	1044	1236	1354	1442	1585	*(37.5)*	*(37.2)*	*(37.1)*	*(37.0)*	*(38.5)*	*(46.2)*	*(55.4)*	*(64.5)*	*(83.3)*
4 years old	405	683	760	813	895	1063	1258	1376	1463	1603	*(35.6)*	*(29.9)*	*(27.5)*	*(27.1)*	*(31.8)*	*(40.4)*	*(48.8)*	*(56.3)*	*(70.8)*
Total, age adjusted	–	621	706	766	858	1045	1259	1388	1483	1637	*(20.3)*	*(19.4)*	*(19.9)*	*(20.4)*	*(18.8)*	*(23.7)*	*(29.1)*	*(33.4)*	*(42.5)*
WIC children																			
1 year old	380	596	685	746	839	1021	1226	1350	1441	1588	*(38.0)*	*(37.0)*	*(36.8)*	*(37.1)*	*(40.5)*	*(49.7)*	*(57.9)*	*(65.2)*	*(79.5)*
2 years old	380	608	692	752	846	1035	1238	1351	1428	1544	*(37.6)*	*(41.0)*	*(44.2)*	*(49.5)*	*(57.3)*	*(59.9)*	*(61.7)*	*(63.2)*	*(66.2)*
3 years old	380	680	770	830	920	1095	1295	1422	1519	1681	*(68.1)*	*(61.0)*	*(57.6)*	*(56.8)*	*(63.7)*	*(87.4)*	*(109.0)*	*(127.0)*	*(163.0)*
4 years old	405	639	707	754	826	984	1192	1326	1425	1580	*(76.2)*	*(65.0)*	*(52.7)*	*(50.2)*	*(82.9)*	*(78.6)*	*(90.8)*	*(102.0)*	*(108.0)*
Total, age adjusted	–	598	686	748	842	1031	1248	1381	1479	1638	*(27.0)*	*(28.2)*	*(29.1)*	*(30.3)*	*(32.9)*	*(39.0)*	*(47.1)*	*(55.8)*	*(74.9)*
Income-eligible nonparticipating children																			
1 year old	380	623	715	780	878	1077	1314	1467	1584	1781	*(54.4)*	*(65.9)*	*(69.7)*	*(67.3)*	*(67.5)*	*(104.0)*	*(117.0)*	*(121.0)*	*(149.0)*
2 years old	380	658	740	798	888	1068	1264	1376	1455	1575	*(37.7)*	*(37.9)*	*(38.5)*	*(40.3)*	*(47.8)*	*(59.0)*	*(65.3)*	*(69.8)*	*(77.8)*
3 years old	380	628	703	756	840	1012	1207	1321	1402	1528	*(48.1)*	*(47.5)*	*(47.7)*	*(49.1)*	*(54.6)*	*(64.0)*	*(71.4)*	*(77.8)*	*(89.9)*
4 years old	405	670	757	818	911	1099	1323	1466	1573	1752	*(77.1)*	*(64.7)*	*(58.5)*	*(54.0)*	*(63.0)*	*(92.4)*	*(115.0)*	*(131.0)*	*(161.0)*
Total, age adjusted	–	618	706	768	863	1058	1286	1427	1532	1704	*(26.5)*	*(26.1)*	*(26.1)*	*(26.7)*	*(30.9)*	*(40.1)*	*(47.8)*	*(55.2)*	*(71.6)*
Higher-income nonparticipating children																			
1 year old	380	655	744	806	902	1092	1296	1411	1491	1614	*(60.2)*	*(52.9)*	*(49.6)*	*(47.6)*	*(51.2)*	*(67.0)*	*(83.4)*	*(98.2)*	*(126.0)*
2 years old	380	630	707	761	847	1023	1221	1336	1419	1546	*(46.0)*	*(49.5)*	*(51.1)*	*(52.3)*	*(54.8)*	*(62.7)*	*(65.7)*	*(66.3)*	*(68.5)*
3 years old	380	662	730	778	852	1006	1192	1312	1403	1557	*(56.1)*	*(59.8)*	*(61.4)*	*(62.0)*	*(66.4)*	*(90.5)*	*(112.0)*	*(132.0)*	*(177.0)*
4 years old	405	703	775	828	911	1076	1240	1334	1403	1513	*(45.1)*	*(39.4)*	*(37.3)*	*(39.1)*	*(53.9)*	*(49.0)*	*(62.9)*	*(72.8)*	*(83.4)*
Total, age adjusted	–	636	718	775	864	1043	1246	1367	1456	1597	*(35.0)*	*(34.1)*	*(32.4)*	*(30.0)*	*(31.7)*	*(36.7)*	*(45.1)*	*(53.9)*	*(70.0)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-29—Potassium (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	2164	*(65.7)*	375	2171	*(83.1)*	193	2166	*(116.1)*	191	2173	*(120.9)*
2 years old	784	2130	*(68.1)*	307	2260	*(109.0)*	219	2169	*(96.7)*	220	2010	*(99.1)*
3 years old	518	2159	*(78.2)*	192	2355	*(140.1)*	171	2042	*(125.9)*	131	2078	*(125.9)*
4 years old	499	2161	*(73.2)*	132	2053	*(161.0)*	179	2155	*(167.5)*	167	2204	*(101.4)*
Total, age adjusted	2,586	2153	*(43.3)*	1,006	2215	*(69.4)*	762	2130	*(67.6)*	709	2115	*(61.3)*
	Mean Usual Intake as a Percent of Adequate Intake (AI)[1]											
Children												
1 year old	785	72.1	*(2.19)*	375	72.4	*(2.77)*	193	72.2	*(3.87)*	191	72.4	*(4.03)*
2 years old	784	71.0	*(2.27)*	307	75.3	*(3.63)*	219	72.3	*(3.22)*	220	67.0	*(3.30)*
3 years old	518	72.0	*(2.61)*	192	78.5	*(4.67)*	171	68.1	*(4.20)*	131	69.3	*(4.20)*
4 years old	499	56.9	*(1.93)*	132	54.0	*(4.24)*	179	56.7	*(4.41)*	167	58.0	*(2.67)*
Total, age adjusted	2,586	67.9	*(1.13)*	1,006	69.9	*(1.95)*	762	67.2	*(1.98)*	709	66.6	*(1.80)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

1 Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-30—Potassium (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AI (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	3000	1298	1467	1583	1757	2102	2497	2745	2932	3243	*(54.9)*	*(53.2)*	*(52.5)*	*(52.5)*	*(59.8)*	*(80.2)*	*(96.3)*	*(110.0)*	*(134.0)*
2 years old	3000	1206	1372	1494	1686	2078	2509	2761	2944	3236	*(49.3)*	*(52.9)*	*(56.1)*	*(61.8)*	*(72.1)*	*(79.6)*	*(86.9)*	*(97.7)*	*(132.0)*
3 years old	3000	1235	1398	1515	1700	2085	2531	2807	3012	3349	*(80.9)*	*(72.9)*	*(69.3)*	*(69.7)*	*(80.9)*	*(93.2)*	*(109.0)*	*(121.0)*	*(141.0)*
4 years old	3800	1260	1423	1540	1724	2104	2536	2791	2972	3255	*(72.9)*	*(67.1)*	*(65.3)*	*(65.3)*	*(71.9)*	*(87.2)*	*(100.0)*	*(112.0)*	*(133.0)*
Total, age adjusted	–	1224	1395	1515	1703	2085	2527	2796	2995	3316	*(40.0)*	*(39.1)*	*(38.8)*	*(38.8)*	*(41.5)*	*(50.3)*	*(58.6)*	*(66.2)*	*(81.7)*
WIC children																			
1 year old	3000	1250	1430	1556	1751	2131	2537	2776	2951	3235	*(79.1)*	*(76.5)*	*(75.3)*	*(74.0)*	*(78.3)*	*(102.0)*	*(123.0)*	*(140.0)*	*(170.0)*
2 years old	3000	1168	1366	1513	1746	2215	2711	2992	3193	3511	*(92.8)*	*(95.5)*	*(97.4)*	*(108.0)*	*(129.0)*	*(127.0)*	*(145.0)*	*(166.0)*	*(195.0)*
3 years old	3000	1267	1460	1596	1808	2258	2807	3144	3388	3769	*(131.0)*	*(123.0)*	*(117.0)*	*(112.0)*	*(131.0)*	*(187.0)*	*(235.0)*	*(266.0)*	*(305.0)*
4 years old	3800	1192	1324	1422	1583	1944	2401	2696	2918	3285	*(115.0)*	*(124.0)*	*(129.0)*	*(138.0)*	*(156.0)*	*(192.0)*	*(226.0)*	*(258.0)*	*(324.0)*
Total, age adjusted	–	1198	1380	1510	1714	2134	2625	2926	3148	3506	*(60.9)*	*(64.5)*	*(66.2)*	*(67.7)*	*(71.0)*	*(82.0)*	*(100.0)*	*(119.0)*	*(153.0)*
Income-eligible nonparticipating children																			
1 year old	3000	1281	1442	1549	1711	2056	2513	2814	3042	3413	*(84.0)*	*(80.2)*	*(78.4)*	*(79.3)*	*(99.5)*	*(150.0)*	*(193.0)*	*(230.0)*	*(300.0)*
2 years old	3000	1295	1460	1577	1759	2127	2533	2767	2932	3185	*(75.6)*	*(73.1)*	*(74.2)*	*(79.7)*	*(98.2)*	*(122.0)*	*(138.0)*	*(150.0)*	*(171.0)*
3 years old	3000	1088	1251	1371	1562	1967	2441	2726	2932	3258	*(124.0)*	*(118.0)*	*(116.0)*	*(115.0)*	*(123.0)*	*(147.0)*	*(170.0)*	*(192.0)*	*(236.0)*
4 years old	3800	1178	1349	1470	1658	2065	2572	2882	3102	3436	*(156.0)*	*(145.0)*	*(141.0)*	*(141.0)*	*(162.0)*	*(208.0)*	*(239.0)*	*(259.0)*	*(284.0)*
Total, age adjusted	–	1169	1340	1462	1650	2048	2527	2821	3034	3371	*(63.2)*	*(61.4)*	*(60.8)*	*(61.1)*	*(65.3)*	*(79.9)*	*(94.8)*	*(107.0)*	*(129.0)*
Higher-income nonparticipating children																			
1 year old	3000	1375	1545	1657	1820	2123	2466	2687	2856	3142	*(111.0)*	*(94.5)*	*(87.3)*	*(84.3)*	*(103.0)*	*(148.0)*	*(181.0)*	*(208.0)*	*(257.0)*
2 years old	3000	1195	1339	1445	1613	1966	2361	2584	2739	2973	*(92.6)*	*(109.0)*	*(115.0)*	*(115.0)*	*(108.0)*	*(124.0)*	*(130.0)*	*(131.0)*	*(152.0)*
3 years old	3000	1310	1436	1527	1674	2004	2395	2626	2797	3087	*(88.2)*	*(86.7)*	*(91.4)*	*(101.0)*	*(122.0)*	*(144.0)*	*(184.0)*	*(220.0)*	*(294.0)*
4 years old	3800	1373	1541	1659	1837	2184	2549	2753	2893	3105	*(95.3)*	*(96.0)*	*(97.9)*	*(102.0)*	*(110.0)*	*(116.0)*	*(121.0)*	*(125.0)*	*(136.0)*
Total, age adjusted	–	1276	1435	1547	1720	2067	2456	2688	2856	3122	*(70.6)*	*(66.4)*	*(60.5)*	*(56.4)*	*(67.3)*	*(70.8)*	*(89.2)*	*(108.0)*	*(134.0)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-31—Sodium (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
Mean Usual Intake												
Children												
1 year old	785	1860	*(65.7)*	375	1901	*(96.7)*	193	2016	*(136.2)*	191	1732	*(85.9)*
2 years old	784	2233	*(48.8)*	307	2343	*(120.3)*	219	2426	*(121.9)*	220	2048	*(104.0)*
3 years old	518	2403	*(91.3)*	192	2620	*(161.1)*	171	2416	*(124.5)*	131	** 2106	*(94.2)*
4 years old	499	2598	*(83.1)*	132	2630	*(157.9)*	179	2723	*(161.0)*	167	2493	*(149.2)*
Total, age adjusted	2,586	2268	*(42.7)*	1,006	2313	*(72.1)*	762	2413	*(69.4)*	709	* 2109	*(64.6)*
Mean Usual Intake as a Percent of Adequate Intake (AI)[1]												
Children												
1 year old	785	186.0	*(6.57)*	375	190.1	*(9.67)*	193	201.6	*(13.62)*	191	173.2	*(8.59)*
2 years old	784	223.3	*(4.88)*	307	234.3	*(12.03)*	219	242.6	*(12.19)*	220	204.8	*(10.40)*
3 years old	518	240.3	*(9.13)*	192	262.0	*(16.11)*	171	241.6	*(12.45)*	131	** 210.6	*(9.42)*
4 years old	499	216.5	*(6.92)*	132	219.2	*(13.16)*	179	226.9	*(13.42)*	167	207.8	*(12.43)*
Total, age adjusted	2,586	216.5	*(3.53)*	1,006	226.4	*(6.48)*	762	228.2	*(6.47)*	709	** 199.2	*(5.17)*
Percent of Children with Usual Intake Above the Tolerable Upper Intake Level (UL)[2]												
Children												
1 year old	785	67.6	*(3.89)*	375	67.4	*(6.55)*	193	75.6	*(9.41)*	191	62.8	*(6.50)*
2 years old	784	88.1	*(1.97)*	307	90.9	*(3.43)*	219	93.8 u	*(2.41)*	220	81.1	*(5.89)*
3 years old	518	96.4 u	*(1.39)*	192	98.0 u	*(1.33)*	171	97.3 u	*(1.53)*	131	92.1 u	*(3.75)*
4 years old	499	90.5	*(2.89)*	132	91.6 u	*(4.91)*	179	91.7 u	*(4.57)*	167	87.8	*(5.11)*
Total, age adjusted	2,586	85.7	*(1.36)*	1,006	87.0	*(2.25)*	762	89.6	*(2.71)*	709	81.0	*(2.70)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

1 Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

2 The DRI Tolerable Upper Intake Level (UL) is the highest usual daily intake level that is likely to pose no risk of adverse health effects.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-32—Sodium (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AI (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	1000	889	1064	1187	1379	1772	2240	2536	2760	3133	*(65.1)*	*(64.0)*	*(63.1)*	*(61.7)*	*(63.8)*	*(78.8)*	*(93.9)*	*(109.0)*	*(144.0)*
2 years old	1000	1285	1452	1572	1762	2158	2621	2902	3108	3436	*(47.8)*	*(48.3)*	*(48.4)*	*(48.3)*	*(52.0)*	*(66.5)*	*(79.7)*	*(92.1)*	*(120.0)*
3 years old	1000	1563	1720	1831	2003	2352	2747	2981	3150	3416	*(70.6)*	*(69.8)*	*(70.3)*	*(74.3)*	*(90.6)*	*(110.0)*	*(125.0)*	*(140.0)*	*(169.0)*
4 years old	1200	1753	1913	2027	2203	2558	2950	3175	3335	3581	*(76.2)*	*(78.3)*	*(78.9)*	*(78.8)*	*(83.1)*	*(98.3)*	*(109.0)*	*(117.0)*	*(138.0)*
Total, age adjusted	–	1135	1335	1478	1702	2171	2724	3067	3321	3734	*(30.4)*	*(31.0)*	*(32.1)*	*(34.6)*	*(41.3)*	*(53.2)*	*(63.7)*	*(73.2)*	*(92.1)*
WIC children																			
1 year old	1000	861	1031	1158	1363	1806	2337	2660	2895	3267	*(93.6)*	*(136.0)*	*(149.0)*	*(135.0)*	*(98.0)*	*(215.0)*	*(234.0)*	*(210.0)*	*(201.0)*
2 years old	1000	1337	1529	1664	1871	2286	2751	3027	3226	3541	*(109.0)*	*(112.0)*	*(112.0)*	*(109.0)*	*(123.0)*	*(168.0)*	*(186.0)*	*(192.0)*	*(201.0)*
3 years old	1000	1698	1877	2001	2188	2562	2987	3245	3434	3740	*(127.0)*	*(126.0)*	*(128.0)*	*(132.0)*	*(150.0)*	*(188.0)*	*(225.0)*	*(260.0)*	*(327.0)*
4 years old	1200	1782	1944	2058	2233	2581	2965	3196	3367	3646	*(142.0)*	*(142.0)*	*(140.0)*	*(139.0)*	*(154.0)*	*(183.0)*	*(217.0)*	*(254.0)*	*(336.0)*
Total, age adjusted	–	1116	1336	1490	1729	2213	2781	3137	3405	3850	*(46.2)*	*(50.8)*	*(54.0)*	*(58.6)*	*(68.8)*	*(88.9)*	*(109.0)*	*(129.0)*	*(174.0)*
Income-eligible nonparticipating children																			
1 year old	1000	887	1109	1271	1513	1936	2414	2751	3013	3440	*(233.0)*	*(158.0)*	*(125.0)*	*(189.0)*	*(129.0)*	*(209.0)*	*(225.0)*	*(273.0)*	*(406.0)*
2 years old	1000	1451	1625	1751	1949	2356	2820	3100	3307	3643	*(87.6)*	*(102.0)*	*(107.0)*	*(109.0)*	*(118.0)*	*(144.0)*	*(172.0)*	*(200.0)*	*(257.0)*
3 years old	1000	1617	1772	1881	2049	2385	2748	2956	3101	3323	*(99.3)*	*(101.0)*	*(103.0)*	*(107.0)*	*(124.0)*	*(154.0)*	*(175.0)*	*(190.0)*	*(216.0)*
4 years old	1200	1773	1953	2081	2282	2693	3131	3369	3531	3774	*(155.0)*	*(149.0)*	*(149.0)*	*(153.0)*	*(182.0)*	*(206.0)*	*(207.0)*	*(203.0)*	*(204.0)*
Total, age adjusted	–	1217	1436	1592	1835	2333	2902	3243	3490	3884	*(77.4)*	*(95.4)*	*(99.6)*	*(89.5)*	*(68.2)*	*(127.0)*	*(146.0)*	*(145.0)*	*(152.0)*
Higher-income nonparticipating children																			
1 year old	1000	912	1057	1161	1327	1675	2075	2313	2484	2750	*(112.0)*	*(103.0)*	*(97.7)*	*(91.8)*	*(88.3)*	*(98.7)*	*(113.0)*	*(128.0)*	*(156.0)*
2 years old	1000	1183	1325	1429	1598	1962	2404	2678	2880	3206	*(99.3)*	*(103.0)*	*(102.0)*	*(102.0)*	*(109.0)*	*(125.0)*	*(151.0)*	*(167.0)*	*(196.0)*
3 years old	1000	1415	1548	1642	1787	2077	2393	2574	2701	2895	*(95.5)*	*(92.9)*	*(92.2)*	*(92.8)*	*(99.0)*	*(111.0)*	*(120.0)*	*(127.0)*	*(139.0)*
4 years old	1200	1704	1851	1956	2120	2451	2821	3037	3190	3427	*(99.5)*	*(105.0)*	*(111.0)*	*(122.0)*	*(146.0)*	*(182.0)*	*(209.0)*	*(232.0)*	*(275.0)*
Total, age adjusted	–	1100	1268	1392	1592	2020	2529	2839	3064	3422	*(51.3)*	*(51.1)*	*(51.7)*	*(54.4)*	*(66.5)*	*(86.5)*	*(101.0)*	*(113.0)*	*(142.0)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-33—Zinc (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	7.9	*(0.22)*	375	8.3	*(0.45)*	193	8.4	*(0.50)*	191	7.4	*(0.33)*
2 years old	784	8.2	*(0.24)*	307	8.6	*(0.45)*	219	8.7	*(0.42)*	220	7.5	*(0.39)*
3 years old	518	8.7	*(0.33)*	192	9.8	*(0.55)*	171	9.2	*(0.75)*	131	***7.5	*(0.42)*
4 years old	499	9.3	*(0.37)*	132	9.2	*(0.81)*	179	9.2	*(0.62)*	167	9.4	*(0.60)*
Total, age adjusted	2,586	8.5	*(0.14)*	1,006	8.8	*(0.30)*	762	8.9	*(0.27)*	709	* 8.0	*(0.26)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	99.8	*(0.11)*	375	99.8	*(0.19)*	193	99.7	*(0.29)*	191	99.9	*(0.23)*
2 years old	784	100.0	*(0.00)*	307	100.0	*(0.09)*	219	100.0	*(0.00)*	220	100.0	*(0.00)*
3 years old	518	100.0	*(0.00)*	192	100.0	*(0.00)*	171	100.0	*(0.00)*	131	100.0	*(0.00)*
4 years old	499	99.7	*(0.19)*	132	99.6	*(0.43)*	179	99.5	*(0.62)*	167	99.8	*(0.23)*
Total, age adjusted	2,586	99.9	*(0.06)*	1,006	99.8	*(0.12)*	762	99.8	*(0.17)*	709	99.9	*(0.08)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

1 The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-34—Zinc (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	2.5	4.5	5.2	5.6	6.2	7.6	9.2	10.3	11.1	12.6	*(0.21)*	*(0.21)*	*(0.20)*	*(0.20)*	*(0.20)*	*(0.24)*	*(0.32)*	*(0.42)*	*(0.68)*
2 years old	2.5	4.7	5.3	5.8	6.4	7.9	9.6	10.6	11.4	12.6	*(0.19)*	*(0.19)*	*(0.21)*	*(0.23)*	*(0.24)*	*(0.33)*	*(0.37)*	*(0.40)*	*(0.45)*
3 years old	2.5	5.4	6.0	6.4	7.1	8.5	10.1	11.1	11.8	13.0	*(0.30)*	*(0.31)*	*(0.31)*	*(0.32)*	*(0.33)*	*(0.37)*	*(0.42)*	*(0.45)*	*(0.53)*
4 years old	4.0	5.8	6.4	6.9	7.6	9.0	10.6	11.7	12.4	13.6	*(0.29)*	*(0.29)*	*(0.30)*	*(0.31)*	*(0.36)*	*(0.46)*	*(0.54)*	*(0.61)*	*(0.74)*
Total, age adjusted	–	4.7	5.4	5.8	6.6	8.1	10.0	11.2	12.1	13.6	*(0.13)*	*(0.13)*	*(0.13)*	*(0.12)*	*(0.13)*	*(0.16)*	*(0.21)*	*(0.25)*	*(0.34)*
WIC children																			
1 year old	2.5	4.4	5.0	5.5	6.2	7.6	9.7	11.1	12.2	14.1	*(0.36)*	*(0.34)*	*(0.32)*	*(0.33)*	*(0.38)*	*(0.54)*	*(0.70)*	*(0.95)*	*(1.69)*
2 years old	2.5	4.9	5.5	6.0	6.8	8.4	10.1	11.2	11.9	13.2	*(0.35)*	*(0.37)*	*(0.38)*	*(0.40)*	*(0.47)*	*(0.51)*	*(0.58)*	*(0.66)*	*(0.80)*
3 years old	2.5	5.9	6.6	7.2	8.0	9.6	11.3	12.2	13.0	14.1	*(0.45)*	*(0.45)*	*(0.46)*	*(0.47)*	*(0.54)*	*(0.68)*	*(0.91)*	*(1.13)*	*(1.54)*
4 years old	4.0	5.3	5.9	6.3	7.0	8.6	10.7	12.1	13.1	14.8	*(0.57)*	*(0.63)*	*(0.67)*	*(0.72)*	*(0.83)*	*(0.96)*	*(1.07)*	*(1.18)*	*(1.42)*
Total, age adjusted	–	4.7	5.3	5.8	6.6	8.3	10.5	11.8	12.9	14.6	*(0.23)*	*(0.24)*	*(0.26)*	*(0.27)*	*(0.27)*	*(0.32)*	*(0.44)*	*(0.58)*	*(0.90)*
Income-eligible nonparticipating children																			
1 year old	2.5	4.5	5.2	5.7	6.5	8.1	9.9	11.1	11.9	13.2	*(0.48)*	*(0.60)*	*(0.62)*	*(0.56)*	*(0.46)*	*(0.79)*	*(0.89)*	*(0.92)*	*(1.09)*
2 years old	2.5	5.0	5.7	6.2	7.0	8.5	10.3	11.3	12.0	13.2	*(0.33)*	*(0.37)*	*(0.39)*	*(0.42)*	*(0.45)*	*(0.50)*	*(0.51)*	*(0.52)*	*(0.59)*
3 years old	2.5	5.2	5.9	6.3	7.1	8.8	10.9	12.1	13.0	14.5	*(0.47)*	*(0.49)*	*(0.52)*	*(0.56)*	*(0.70)*	*(0.92)*	*(1.09)*	*(1.22)*	*(1.45)*
4 years old	4.0	5.6	6.3	6.8	7.5	9.0	10.6	11.6	12.3	13.4	*(0.61)*	*(0.60)*	*(0.60)*	*(0.58)*	*(0.58)*	*(0.81)*	*(1.05)*	*(1.25)*	*(1.55)*
Total, age adjusted	–	4.7	5.4	5.9	6.8	8.5	10.6	11.9	12.8	14.3	*(0.22)*	*(0.22)*	*(0.22)*	*(0.22)*	*(0.26)*	*(0.31)*	*(0.36)*	*(0.41)*	*(0.56)*
Higher-income nonparticipating children																			
1 year old	2.5	4.7	5.2	5.6	6.2	7.2	8.4	9.1	9.7	10.6	*(0.37)*	*(0.31)*	*(0.29)*	*(0.27)*	*(0.31)*	*(0.41)*	*(0.48)*	*(0.54)*	*(0.68)*
2 years old	2.5	4.5	5.0	5.4	6.0	7.2	8.7	9.6	10.3	11.5	*(0.38)*	*(0.41)*	*(0.42)*	*(0.40)*	*(0.40)*	*(0.56)*	*(0.60)*	*(0.60)*	*(0.72)*
3 years old	2.5	5.0	5.5	5.8	6.3	** 7.3	** 8.5	* 9.2	9.6	10.4	*(0.50)*	*(0.49)*	*(0.48)*	*(0.45)*	*(0.43)*	*(0.47)*	*(0.51)*	*(0.55)*	*(0.63)*
4 years old	4.0	6.1	6.8	7.2	7.9	9.2	10.6	11.5	12.2	13.4	*(0.38)*	*(0.38)*	*(0.40)*	*(0.44)*	*(0.55)*	*(0.75)*	*(0.92)*	*(1.06)*	*(1.35)*
Total, age adjusted	–	4.7	5.3	5.7	6.4	7.7	* 9.2	10.2	11.0	12.3	*(0.21)*	*(0.20)*	*(0.20)*	*(0.20)*	*(0.23)*	*(0.31)*	*(0.40)*	*(0.48)*	*(0.65)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-35—Dietary Fiber (g)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	8.4	*(0.29)*	375	8.5	*(0.45)*	193	8.1	*(0.44)*	191	8.6	*(0.60)*
2 years old	784	9.8	*(0.40)*	307	10.5	*(0.79)*	219	9.9	*(0.60)*	220	9.3	*(0.68)*
3 years old	518	10.6	*(0.52)*	192	11.7	*(0.78)*	171	10.2	*(0.79)*	131	10.4	*(0.89)*
4 years old	499	11.3	*(0.39)*	132	10.7	*(0.99)*	179	11.3	*(0.89)*	167	11.4	*(0.58)*
Total, age adjusted	2,586	10.0	*(0.23)*	1,006	10.1	*(0.38)*	762	10.0	*(0.37)*	709	9.9	*(0.43)*
	Mean Usual Intake as a Percent of Adequate Intake (AI)[1]											
Children												
1 year old	785	44.3	*(1.54)*	375	44.6	*(2.36)*	193	42.4	*(2.32)*	191	45.2	*(3.15)*
2 years old	784	51.6	*(2.09)*	307	55.2	*(4.15)*	219	52.3	*(3.15)*	220	48.7	*(3.58)*
3 years old	518	56.0	*(2.72)*	192	61.3	*(4.10)*	171	53.5	*(4.14)*	131	54.6	*(4.67)*
4 years old	499	45.1	*(1.56)*	132	42.9	*(3.96)*	179	45.1	*(3.56)*	167	45.4	*(2.32)*
Total, age adjusted	2,586	49.2	*(1.02)*	1,006	51.0	*(1.86)*	762	48.3	*(1.68)*	709	48.5	*(1.76)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

1 Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-36—Dietary Fiber (g): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AI (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	19	3.9	4.7	5.3	6.2	8.0	10.3	11.6	12.6	14.2	*(0.26)*	*(0.25)*	*(0.25)*	*(0.26)*	*(0.30)*	*(0.38)*	*(0.43)*	*(0.48)*	*(0.57)*
2 years old	19	5.3	6.1	6.7	7.6	9.5	11.7	13.0	14.0	15.5	*(0.31)*	*(0.32)*	*(0.32)*	*(0.34)*	*(0.39)*	*(0.49)*	*(0.56)*	*(0.60)*	*(0.66)*
3 years old	19	5.7	6.6	7.2	8.2	10.2	12.6	14.1	15.2	17.0	*(0.35)*	*(0.35)*	*(0.36)*	*(0.39)*	*(0.48)*	*(0.64)*	*(0.75)*	*(0.84)*	*(0.98)*
4 years old	25	6.4	7.2	7.9	8.8	10.9	13.3	14.7	15.8	17.6	*(0.35)*	*(0.35)*	*(0.35)*	*(0.35)*	*(0.38)*	*(0.50)*	*(0.58)*	*(0.64)*	*(0.76)*
Total, age adjusted	–	4.8	5.7	6.3	7.4	9.5	12.1	13.7	14.9	16.9	*(0.17)*	*(0.16)*	*(0.16)*	*(0.17)*	*(0.21)*	*(0.29)*	*(0.36)*	*(0.41)*	*(0.49)*
WIC children																			
1 year old	19	3.7	4.5	5.2	6.1	8.2	10.5	11.8	12.8	14.3	*(0.39)*	*(0.39)*	*(0.39)*	*(0.40)*	*(0.49)*	*(0.56)*	*(0.59)*	*(0.62)*	*(0.71)*
2 years old	19	5.2	6.1	6.8	7.8	10.1	12.7	14.2	15.4	17.2	*(0.58)*	*(0.60)*	*(0.61)*	*(0.65)*	*(0.80)*	*(0.97)*	*(1.08)*	*(1.17)*	*(1.35)*
3 years old	19	6.1	7.0	7.7	8.7	11.1	14.0	15.8	17.1	19.3	*(0.76)*	*(0.67)*	*(0.63)*	*(0.64)*	*(0.75)*	*(1.05)*	*(1.30)*	*(1.44)*	*(1.55)*
4 years old	25	5.6	6.4	6.9	7.8	9.9	12.8	14.8	16.3	18.8	*(0.71)*	*(0.74)*	*(0.77)*	*(0.82)*	*(0.96)*	*(1.21)*	*(1.41)*	*(1.56)*	*(1.85)*
Total, age adjusted	–	4.6	5.5	6.1	7.2	9.4	12.4	14.3	15.7	18.1	*(0.26)*	*(0.27)*	*(0.28)*	*(0.30)*	*(0.37)*	*(0.50)*	*(0.59)*	*(0.66)*	*(0.78)*
Income-eligible nonparticipating children																			
1 year old	19	3.7	4.4	5.0	5.8	7.7	9.9	11.2	12.2	13.7	*(0.39)*	*(0.41)*	*(0.43)*	*(0.44)*	*(0.48)*	*(0.57)*	*(0.64)*	*(0.69)*	*(0.80)*
2 years old	19	5.6	6.3	6.9	7.8	9.6	11.7	13.0	13.9	15.4	*(0.54)*	*(0.50)*	*(0.48)*	*(0.48)*	*(0.57)*	*(0.81)*	*(0.96)*	*(1.05)*	*(1.15)*
3 years old	19	5.3	6.1	6.7	7.6	9.6	12.2	13.7	14.9	16.8	*(0.44)*	*(0.48)*	*(0.50)*	*(0.55)*	*(0.71)*	*(1.02)*	*(1.28)*	*(1.51)*	*(1.93)*
4 years old	25	6.1	7.0	7.6	8.6	10.8	13.4	15.0	16.2	18.2	*(0.64)*	*(0.66)*	*(0.69)*	*(0.74)*	*(0.87)*	*(1.08)*	*(1.25)*	*(1.40)*	*(1.65)*
Total, age adjusted	–	4.7	5.6	6.2	7.2	9.4	12.0	13.7	15.0	17.1	*(0.26)*	*(0.28)*	*(0.31)*	*(0.31)*	*(0.42)*	*(0.53)*	*(0.63)*	*(0.76)*	*(0.92)*
Higher-income nonparticipating children																			
1 year old	19	4.2	5.0	5.5	6.3	8.1	10.4	11.8	12.9	14.5	*(0.62)*	*(0.54)*	*(0.47)*	*(0.43)*	*(0.63)*	*(0.84)*	*(1.02)*	*(1.14)*	*(1.30)*
2 years old	19	5.3	5.9	6.4	7.2	8.9	10.9	12.1	13.0	14.4	*(0.45)*	*(0.48)*	*(0.50)*	*(0.55)*	*(0.66)*	*(0.82)*	*(0.94)*	*(1.04)*	*(1.22)*
3 years old	19	5.7	6.6	7.2	8.2	10.2	12.3	13.6	14.5	15.8	*(0.84)*	*(0.79)*	*(0.77)*	*(0.76)*	*(0.85)*	*(1.04)*	*(1.18)*	*(1.29)*	*(1.48)*
4 years old	25	7.0	7.9	8.4	9.3	11.2	13.2	14.3	15.1	16.3	*(0.47)*	*(0.45)*	*(0.45)*	*(0.47)*	*(0.56)*	*(0.75)*	*(0.89)*	*(1.01)*	*(1.23)*
Total, age adjusted	–	5.0	5.9	6.5	7.5	9.6	12.0	13.4	14.4	16.0	*(0.38)*	*(0.35)*	*(0.35)*	*(0.35)*	*(0.40)*	*(0.51)*	*(0.59)*	*(0.66)*	*(0.79)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-37—Dietary Fiber (g/1,000 kcal)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	6.14	*(0.17)*	375	6.21	*(0.38)*	193	5.52	*(0.29)*	191	6.44	*(0.34)*
2 years old	784	6.54	*(0.21)*	307	6.55	*(0.38)*	219	6.28	*(0.32)*	220	6.71	*(0.36)*
3 years old	518	6.69	*(0.25)*	192	6.84	*(0.35)*	171	6.34	*(0.42)*	131	6.94	*(0.41)*
4 years old	499	6.55	*(0.19)*	132	6.39	*(0.42)*	179	6.36	*(0.50)*	167	6.69	*(0.24)*
Total, age adjusted	2,586	6.48	*(0.12)*	1,006	6.47	*(0.22)*	762	6.15	*(0.23)*	709	6.69	*(0.19)*
	Percent of Children With Usual Intake Greater than or Equal to 14g / 1,000 kcal[1]											
Children												
1 year old	785	0.2 u	*(0.12)*	375	0.3 u	*(0.32)*	193	0.0 u	*(0.14)*	191	0.3 u	*(0.28)*
2 years old	784	0.1 u	*(0.10)*	307	0.2 u	*(0.27)*	219	0.1 u	*(0.25)*	220	0.1 u	*(0.19)*
3 years old	518	0.0 u	*(0.05)*	192	0.2 u	*(0.27)*	171	0.0 u	*(0.04)*	131	0.0	*(0.00)*
4 years old	499	0.0	*(0.00)*	132	0.0 u	*(0.04)*	179	0.1 u	*(0.28)*	167	0.0	*(0.00)*
Total, age adjusted	2,586	0.1 u	*(0.04)*	1,006	0.2 u	*(0.12)*	762	0.1 u	*(0.10)*	709	0.1 u	*(0.08)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 The AIs for fiber are based on intake of 14g of total fiber per 1,000 kcal (IOM, 2006). Intakes of dietary fiber understate total fiber intake.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-38—Dietary Fiber (g/1,000 kcal): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	Guide-line (g/1000 kcal)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	14	3.3	3.8	4.2	4.7	5.9	7.3	8.1	8.8	9.8	*(0.16)*	*(0.15)*	*(0.14)*	*(0.14)*	*(0.16)*	*(0.22)*	*(0.27)*	*(0.31)*	*(0.37)*
2 years old	14	4.0	4.5	4.8	5.3	6.4	7.6	8.3	8.8	9.7	*(0.17)*	*(0.17)*	*(0.17)*	*(0.17)*	*(0.20)*	*(0.25)*	*(0.29)*	*(0.32)*	*(0.37)*
3 years old	14	4.4	4.8	5.1	5.6	6.5	7.6	8.3	8.8	9.5	*(0.24)*	*(0.21)*	*(0.20)*	*(0.20)*	*(0.23)*	*(0.30)*	*(0.35)*	*(0.40)*	*(0.47)*
4 years old	14	4.5	4.9	5.1	5.5	6.4	7.4	8.0	8.4	9.2	*(0.18)*	*(0.16)*	*(0.16)*	*(0.17)*	*(0.20)*	*(0.22)*	*(0.26)*	*(0.29)*	*(0.36)*
Total, age adjusted	–	4.1	4.6	4.9	5.3	6.3	7.4	8.1	8.6	9.4	*(0.10)*	*(0.10)*	*(0.10)*	*(0.10)*	*(0.12)*	*(0.14)*	*(0.16)*	*(0.17)*	*(0.19)*
WIC children																			
1 year old	14	3.2	3.7	4.1	4.7	6.0	7.4	8.3	9.0	10.0	*(0.28)*	*(0.28)*	*(0.29)*	*(0.31)*	*(0.37)*	*(0.47)*	*(0.55)*	*(0.60)*	*(0.70)*
2 years old	14	3.9	4.4	4.7	5.2	6.3	7.6	8.4	9.0	10.0	*(0.38)*	*(0.29)*	*(0.26)*	*(0.31)*	*(0.47)*	*(0.51)*	*(0.59)*	*(0.68)*	*(0.83)*
3 years old	14	4.4	4.8	5.1	5.6	6.6	7.8	8.6	9.2	10.2	*(0.25)*	*(0.25)*	*(0.25)*	*(0.27)*	*(0.33)*	*(0.44)*	*(0.52)*	*(0.58)*	*(0.70)*
4 years old	14	4.1	4.5	4.8	5.3	6.2	7.3	8.0	8.5	9.2	*(0.28)*	*(0.29)*	*(0.31)*	*(0.34)*	*(0.41)*	*(0.52)*	*(0.60)*	*(0.66)*	*(0.79)*
Total, age adjusted	–	4.0	4.4	4.7	5.2	6.3	7.5	8.3	8.8	9.7	*(0.16)*	*(0.16)*	*(0.16)*	*(0.17)*	*(0.21)*	*(0.27)*	*(0.32)*	*(0.35)*	*(0.41)*
Income-eligible nonparticipating children																			
1 year old	14	3.0	3.5	3.8	4.3	5.3	6.5	7.2	7.8	8.6	*(0.26)*	*(0.27)*	*(0.27)*	*(0.26)*	*(0.26)*	*(0.38)*	*(0.47)*	*(0.54)*	*(0.72)*
2 years old	14	3.8	4.2	4.5	5.0	6.0	7.3	8.1	8.7	9.6	*(0.22)*	*(0.25)*	*(0.26)*	*(0.29)*	*(0.34)*	*(0.39)*	*(0.44)*	*(0.50)*	*(0.61)*
3 years old	14	4.2	4.6	4.8	5.2	6.1	7.2	7.9	8.4	9.2	*(0.22)*	*(0.24)*	*(0.26)*	*(0.30)*	*(0.41)*	*(0.54)*	*(0.63)*	*(0.71)*	*(0.88)*
4 years old	14	4.3	4.6	4.9	5.3	6.1	7.2	7.8	8.4	9.2	*(0.34)*	*(0.32)*	*(0.32)*	*(0.34)*	*(0.44)*	*(0.62)*	*(0.75)*	*(0.86)*	*(1.06)*
Total, age adjusted	–	3.9	4.3	4.6	5.0	6.0	7.1	7.7	8.2	9.0	*(0.12)*	*(0.12)*	*(0.14)*	*(0.17)*	*(0.22)*	*(0.34)*	*(0.39)*	*(0.41)*	*(0.45)*
Higher-income nonparticipating children																			
1 year old	14	3.6	4.1	4.5	5.0	6.2	7.6	8.5	9.1	10.1	*(0.24)*	*(0.24)*	*(0.24)*	*(0.26)*	*(0.32)*	*(0.42)*	*(0.51)*	*(0.57)*	*(0.70)*
2 years old	14	4.3	4.7	5.1	5.5	6.5	7.7	8.4	8.9	9.8	*(0.28)*	*(0.28)*	*(0.29)*	*(0.30)*	*(0.34)*	*(0.43)*	*(0.50)*	*(0.55)*	*(0.64)*
3 years old	14	4.7	5.1	5.5	6.0	6.9	7.8	8.4	8.8	9.5	*(0.57)*	*(0.49)*	*(0.44)*	*(0.40)*	*(0.39)*	*(0.45)*	*(0.50)*	*(0.55)*	*(0.62)*
4 years old	14	4.8	5.2	5.4	5.8	6.6	7.4	8.0	8.4	9.0	*(0.24)*	*(0.23)*	*(0.22)*	*(0.23)*	*(0.25)*	*(0.29)*	*(0.33)*	*(0.36)*	*(0.43)*
Total, age adjusted	–	4.4	4.9	5.2	5.6	6.6	7.6	8.2	8.7	9.4	*(0.21)*	*(0.18)*	*(0.17)*	*(0.16)*	*(0.18)*	*(0.22)*	*(0.26)*	*(0.28)*	*(0.32)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

1 The AIs for fiber are based on intake of 14g of total fiber per 1,000 kcal (IOM, 2006). Intakes of dietary fiber understate total fiber intake.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-39—Total Fat (g) and Saturated Fat (g)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Total fat (g), Mean Usual Intake											
Children												
1 year old	785	52	*(1.7)*	375	52	*(2.7)*	193	57	*(3.3)*	191	50	*(2.4)*
2 years old	784	54	*(2.0)*	307	57	*(3.1)*	219	58	*(2.8)*	220	49	*(2.9)*
3 years old	518	58	*(2.0)*	192	64	*(5.1)*	171	59	*(2.9)*	131	* 51	*(2.9)*
4 years old	499	62	*(2.1)*	132	61	*(5.0)*	179	67	*(4.4)*	167	59	*(2.4)*
Total, age adjusted	2,586	56	*(1.1)*	1,006	58	*(2.4)*	762	60	*(1.7)*	709	* 52	*(1.4)*
	Saturated fat (g)[1], Mean Usual Intake											
2 years old	784	21	*(0.7)*	307	21	*(1.3)*	219	22	*(1.2)*	220	19	*(1.2)*
3 years old	518	22	*(1.1)*	192	25	*(2.2)*	171	22	*(1.4)*	131	19	*(1.5)*
4 years old	499	22	*(0.8)*	132	22	*(1.6)*	179	25	*(1.9)*	167	21	*(1.1)*
Total, age adjusted	1,801	22	*(0.5)*	631	23	*(1.2)*	569	23	*(0.9)*	518	20	*(0.6)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] One-year olds are excluded from the table because Dietary Guidelines recommendations for saturated fat apply to persons age 2 years and older.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation*.

Table B-40—Total Fat (% of energy intake)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	33.3	*(0.43)*	375	32.6	*(0.76)*	193	34.3	*(0.97)*	191	33.7	*(0.96)*
2 years old	784	31.4	*(0.51)*	307	31.6	*(0.79)*	219	31.7	*(0.94)*	220	31.4	*(0.94)*
3 years old	518	32.1	*(0.69)*	192	32.6	*(1.27)*	171	32.9	*(0.72)*	131	30.7	*(1.17)*
4 years old	499	31.7	*(0.56)*	132	32.8	*(1.10)*	179	32.8	*(0.86)*	167	30.6	*(0.83)*
Total, age adjusted	2,586	32.1	*(0.33)*	1,006	32.4	*(0.55)*	762	32.9	*(0.48)*	709	31.6	*(0.54)*
	Percent of Children with Usual Intake Below the AMDR[1]											
Children												
1 year old	785	22.8	*(3.07)*	375	27.7	*(5.57)*	193	15.6 u	*(6.03)*	191	20.4 u	*(7.51)*
2 years old	784	36.0	*(4.96)*	307	33.2	*(9.59)*	219	33.6	*(9.25)*	220	35.6	*(8.80)*
3 years old	518	26.7	*(7.03)*	192	22.5 u	*(12.00)*	171	17.6 u	*(6.64)*	131	43.4 u	*(13.60)*
4 years old	499	4.5 u	*(1.47)*	132	1.9 u	*(1.58)*	179	1.9 u	*(1.30)*	167	7.8 u	*(3.49)*
Total, age adjusted	2,586	22.3	*(2.30)*	1,006	21.2	*(4.08)*	762	17.0	*(3.21)*	709	26.7	*(4.53)*
	Percent of Children with Usual Intake Above the AMDR[1]											
Children												
1 year old	785	6.7	*(1.51)*	375	5.0 u	*(1.92)*	193	9.1 u	*(3.68)*	191	7.9 u	*(3.23)*
2 years old	784	1.4 u	*(0.68)*	307	0.9 u	*(0.66)*	219	2.1 u	*(1.50)*	220	1.4 u	*(1.50)*
3 years old	518	1.0 u	*(0.78)*	192	1.4 u	*(1.68)*	171	1.2 u	*(0.85)*	131	0.6 u	*(0.95)*
4 years old	499	20.0	*(4.28)*	132	27.8 u	*(13.50)*	179	30.2	*(8.07)*	167	12.9 u	*(4.73)*
Total, age adjusted	2,586	7.4	*(1.18)*	1,006	8.9 u	*(3.51)*	762	10.8	*(2.30)*	709	5.8	*(1.52)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-41—Total Fat (% of energy intake): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AMDR[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	30-40	25.6	27.4	28.6	30.3	33.4	36.4	38.0	39.1	40.6	*(0.62)*	*(0.55)*	*(0.52)*	*(0.48)*	*(0.45)*	*(0.46)*	*(0.47)*	*(0.48)*	*(0.50)*
2 years old	30-40	24.8	26.3	27.3	28.7	31.4	34.1	35.5	36.4	37.8	*(0.72)*	*(0.64)*	*(0.60)*	*(0.56)*	*(0.51)*	*(0.50)*	*(0.51)*	*(0.54)*	*(0.59)*
3 years old	30-40	26.8	27.9	28.7	29.8	32.0	34.2	35.5	36.3	37.6	*(0.62)*	*(0.60)*	*(0.62)*	*(0.66)*	*(0.76)*	*(0.79)*	*(0.81)*	*(0.84)*	*(0.89)*
4 years old	25-35	25.2	26.6	27.6	29.0	31.7	34.3	35.8	36.7	38.2	*(0.60)*	*(0.58)*	*(0.57)*	*(0.56)*	*(0.57)*	*(0.60)*	*(0.62)*	*(0.63)*	*(0.66)*
Total, age adjusted	–	24.6	26.3	27.4	29.0	32.1	35.2	36.8	38.0	39.6	*(0.40)*	*(0.37)*	*(0.35)*	*(0.34)*	*(0.34)*	*(0.37)*	*(0.39)*	*(0.42)*	*(0.46)*
WIC children																			
1 year old	30-40	24.8	26.6	27.8	29.6	32.8	35.8	37.4	38.5	40.0	*(0.89)*	*(0.84)*	*(0.82)*	*(0.80)*	*(0.78)*	*(0.77)*	*(0.77)*	*(0.77)*	*(0.78)*
2 years old	30-40	25.3	26.7	27.7	29.1	31.6	34.1	35.4	36.2	37.5	*(1.12)*	*(1.08)*	*(1.05)*	*(1.00)*	*(0.96)*	*(0.86)*	*(0.77)*	*(0.72)*	*(0.73)*
3 years old	30-40	27.2	28.3	29.1	30.3	32.6	34.9	36.1	36.9	38.1	*(1.05)*	*(1.12)*	*(1.21)*	*(1.32)*	*(1.37)*	*(1.29)*	*(1.30)*	*(1.34)*	*(1.43)*
4 years old	25-35	26.7	28.0	29.0	30.3	32.8	35.3	36.6	37.5	38.8	*(1.19)*	*(1.14)*	*(1.18)*	*(1.20)*	*(1.12)*	*(1.50)*	*(1.54)*	*(1.45)*	*(1.29)*
Total, age adjusted	–	24.9	26.6	27.7	29.4	32.4	35.4	37.0	38.1	39.6	*(0.60)*	*(0.58)*	*(0.57)*	*(0.56)*	*(0.56)*	*(0.57)*	*(0.58)*	*(0.59)*	*(0.61)*
Income-eligible nonparticipating children																			
1 year old	30-40	27.2	28.8	29.9	31.5	34.4	37.3	38.8	39.8	41.3	*(1.33)*	*(1.16)*	*(1.11)*	*(1.06)*	*(1.02)*	*(0.96)*	*(0.94)*	*(0.92)*	*(0.91)*
2 years old	30-40	25.0	26.5	27.5	29.0	31.7	34.5	36.0	37.0	38.4	*(1.44)*	*(1.31)*	*(1.23)*	*(1.11)*	*(0.93)*	*(0.90)*	*(0.94)*	*(0.98)*	*(1.06)*
3 years old	30-40	27.9	29.0	29.7	30.8	32.8	34.9	36.0	36.8	38.0	*(0.82)*	*(0.78)*	*(0.77)*	*(0.75)*	*(0.74)*	*(0.75)*	*(0.77)*	*(0.78)*	*(0.82)*
4 years old	25-35	26.4	27.7	28.6	30.0	32.8	35.7	37.1	38.1	39.5	*(0.84)*	*(0.87)*	*(0.91)*	*(0.94)*	*(0.91)*	*(0.99)*	*(1.00)*	*(0.99)*	*(1.00)*
Total, age adjusted	–	25.6	27.1	28.2	29.8	32.8	35.9	37.6	38.7	40.3	*(0.63)*	*(0.61)*	*(0.62)*	*(0.59)*	*(0.49)*	*(0.54)*	*(0.54)*	*(0.52)*	*(0.53)*
Higher-income nonparticipating children																			
1 year old	30-40	26.1	27.9	29.0	30.7	33.8	36.8	38.4	39.5	40.9	*(1.55)*	*(1.33)*	*(1.27)*	*(1.22)*	*(0.98)*	*(1.12)*	*(1.08)*	*(0.98)*	*(0.88)*
2 years old	30-40	24.9	26.4	27.3	28.8	31.5	34.1	35.5	36.5	37.9	*(0.96)*	*(0.91)*	*(0.90)*	*(0.91)*	*(0.99)*	*(1.06)*	*(1.12)*	*(1.18)*	*(1.31)*
3 years old	30-40	25.5	26.6	27.3	28.4	30.5	32.8	34.1	35.0	36.3	*(1.16)*	*(1.12)*	*(1.10)*	*(1.08)*	*(1.12)*	*(1.30)*	*(1.46)*	*(1.60)*	*(1.85)*
4 years old	25-35	24.1	25.5	26.5	27.9	30.6	33.2	34.6	35.6	37.0	*(0.96)*	*(0.91)*	*(0.89)*	*(0.86)*	*(0.84)*	*(0.85)*	*(0.88)*	*(0.91)*	*(0.97)*
Total, age adjusted	–	24.0	25.7	26.8	28.4	31.5	34.6	36.3	37.5	39.2	*(0.63)*	*(0.59)*	*(0.57)*	*(0.55)*	*(0.56)*	*(0.61)*	*(0.68)*	*(0.74)*	*(0.85)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-42—Saturated Fat (% of energy intake)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
2 years old	784	12.16	*(0.28)*	307	11.98	*(0.36)*	219	12.05	*(0.46)*	220	12.35	*(0.54)*
3 years old	518	11.92	*(0.34)*	192	12.28	*(0.63)*	171	11.99	*(0.52)*	131	11.53	*(0.69)*
4 years old	499	11.54	*(0.31)*	132	11.81	*(0.55)*	179	12.03	*(0.46)*	167	11.13	*(0.50)*
Total, age adjusted	1,801	11.88	*(0.18)*	631	12.05	*(0.35)*	569	12.02	*(0.28)*	518	11.66	*(0.25)*
	Percent of Children Meeting Dietary Guidelines Recommendation[1]											
2 years old	784	16.5	*(3.45)*	307	15.3 u	*(5.18)*	219	17.6 u	*(7.11)*	220	15.9 u	*(5.12)*
3 years old	518	6.4 u	*(3.27)*	192	3.8 u	*(3.77)*	171	6.0 u	*(4.96)*	131	11.4 u	*(10.10)*
4 years old	499	20.0	*(5.07)*	132	14.1 u	*(8.19)*	179	14.2 u	*(5.18)*	167	27.2 u	*(9.36)*
Total, age adjusted	1,801	14.3	*(2.33)*	631	11.1 u	*(3.49)*	569	12.6	*(3.35)*	518	18.3	*(4.92)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] The Dietary Guidelines recommend that persons age 2 years and older consume less than 10 percent of total daily calories from saturated fat.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-43—Saturated Fat (% of energy intake): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	Guide-line (%)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	< 10	9.7 u	10.6 u	11.3 u	12.2 u	13.9 u	15.7 u	16.7 u	17.4 u	18.5 u	*(0.30)*	*(0.26)*	*(0.24)*	*(0.22)*	*(0.23)*	*(0.25)*	*(0.27)*	*(0.29)*	*(0.32)*
2 years old	< 10	8.6	9.3	9.9	10.6	12.1	13.6	14.4	15.0	15.9	*(0.33)*	*(0.31)*	*(0.30)*	*(0.29)*	*(0.29)*	*(0.32)*	*(0.35)*	*(0.38)*	*(0.43)*
3 years old	< 10	9.9	10.3	10.6	11.0	11.9	12.8	13.3	13.6	14.1	*(0.30)*	*(0.31)*	*(0.32)*	*(0.33)*	*(0.34)*	*(0.36)*	*(0.38)*	*(0.38)*	*(0.40)*
4 years old	< 10	8.7	9.3	9.7	10.3	11.5	12.7	13.4	13.9	14.6	*(0.30)*	*(0.30)*	*(0.30)*	*(0.31)*	*(0.32)*	*(0.33)*	*(0.35)*	*(0.37)*	*(0.41)*
Total, age adjusted	–	8.3	9.1	9.6	10.3	11.8	13.3	14.2	14.8	15.7	*(0.17)*	*(0.17)*	*(0.17)*	*(0.17)*	*(0.19)*	*(0.22)*	*(0.25)*	*(0.27)*	*(0.32)*
WIC children																			
1 year old	< 10	9.3 u	10.1 u	10.7 u	11.5 u	13.2 u	14.9 u	15.8 u	16.4 u	17.3 u	*(0.39)*	*(0.37)*	*(0.36)*	*(0.35)*	*(0.36)*	*(0.40)*	*(0.43)*	*(0.46)*	*(0.52)*
2 years old	< 10	8.8	9.5	10.0	10.7	11.9	13.3	14.0	14.5	15.3	*(0.49)*	*(0.45)*	*(0.41)*	*(0.38)*	*(0.38)*	*(0.46)*	*(0.71)*	*(0.84)*	*(0.87)*
3 years old	< 10	10.2	10.6	10.9	11.4	12.3	13.2	13.7	14.0	14.5	*(0.55)*	*(0.56)*	*(0.58)*	*(0.60)*	*(0.64)*	*(0.68)*	*(0.71)*	*(0.73)*	*(0.76)*
4 years old	< 10	9.1	9.7	10.1	10.6	11.8	12.9	13.6	14.0	14.7	*(0.56)*	*(0.56)*	*(0.57)*	*(0.57)*	*(0.56)*	*(0.56)*	*(0.58)*	*(0.60)*	*(0.65)*
Total, age adjusted	–	8.6	9.4	9.9	10.6	12.0	13.4	14.2	14.8	15.7	*(0.38)*	*(0.38)*	*(0.40)*	*(0.40)*	*(0.37)*	*(0.37)*	*(0.40)*	*(0.41)*	*(0.44)*
Income-eligible nonparticipating children																			
1 year old	< 10	10.6 u	11.4 u	11.9 u	12.7 u	14.4 u	16.2 u	17.2 u	17.8 u	18.8 u	*(0.46)*	*(0.50)*	*(0.52)*	*(0.50)*	*(0.51)*	*(0.69)*	*(0.71)*	*(0.67)*	*(0.63)*
2 years old	< 10	8.4	9.2	9.8	10.6	12.0	13.5	14.3	14.8	15.7	*(0.72)*	*(0.67)*	*(0.62)*	*(0.56)*	*(0.46)*	*(0.42)*	*(0.44)*	*(0.48)*	*(0.56)*
3 years old	< 10	9.9	10.3	10.6	11.1	12.0	12.9	13.4	13.7	14.2	*(0.49)*	*(0.50)*	*(0.50)*	*(0.51)*	*(0.53)*	*(0.55)*	*(0.56)*	*(0.56)*	*(0.57)*
4 years old	< 10	9.0	9.6	10.1	10.7	11.9	13.3	14.1	14.6	15.4	*(0.43)*	*(0.40)*	*(0.39)*	*(0.41)*	*(0.49)*	*(0.56)*	*(0.60)*	*(0.64)*	*(0.71)*
Total, age adjusted	–	8.4	9.2	9.7	10.5	11.9	13.5	14.4	15.0	15.9	*(0.30)*	*(0.29)*	*(0.29)*	*(0.29)*	*(0.29)*	*(0.31)*	*(0.33)*	*(0.34)*	*(0.38)*
Higher-income nonparticipating children																			
1 year old	< 10	9.8 u	10.9 u	11.6 u	12.6 u	14.5 u	16.3 u	17.4 u	18.2 u	19.3 u	*(0.82)*	*(0.69)*	*(0.62)*	*(0.56)*	*(0.50)*	*(0.57)*	*(0.66)*	*(0.71)*	*(0.77)*
2 years old	< 10	8.7	9.4	9.9	10.7	12.3	13.9	14.8	15.4	16.4	*(0.50)*	*(0.46)*	*(0.46)*	*(0.53)*	*(0.67)*	*(0.62)*	*(0.70)*	*(0.81)*	*(0.98)*
3 years old	< 10	9.5	9.9	10.2	10.6	11.5	12.4	12.9	13.2	13.8	*(0.56)*	*(0.59)*	*(0.61)*	*(0.64)*	*(0.70)*	*(0.77)*	*(0.81)*	*(0.84)*	*(0.90)*
4 years old	< 10	8.3	8.9	9.3	9.9	11.1	12.3	13.0	13.4	14.1	*(0.47)*	*(0.47)*	*(0.48)*	*(0.49)*	*(0.51)*	*(0.54)*	*(0.57)*	*(0.60)*	*(0.69)*
Total, age adjusted	–	8.1	8.8	9.3	10.1	11.5	13.1	14.0	14.7	15.6	*(0.22)*	*(0.21)*	*(0.22)*	*(0.23)*	*(0.25)*	*(0.30)*	*(0.36)*	*(0.40)*	*(0.50)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 The Dietary Guidelines recommend that persons age 2 years and older consume less than 10 percent of total daily calories from saturated fat.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-44—Linoleic Acid (g)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	6.8	*(0.28)*	375	7.1	*(0.44)*	193	7.4	*(0.60)*	191	6.4	*(0.43)*
2 years old	784	8.0	*(0.48)*	307	8.5	*(1.05)*	219	8.4	*(0.56)*	220	7.2	*(0.51)*
3 years old	518	9.0	*(0.34)*	192	9.7	*(0.79)*	171	9.5	*(0.62)*	131	7.9	*(0.56)*
4 years old	499	9.9	*(0.47)*	132	10.1	*(1.09)*	179	10.0	*(0.78)*	167	9.8	*(0.63)*
Total, age adjusted	2,586	8.4	*(0.20)*	1,006	8.7	*(0.37)*	762	8.9	*(0.33)*	709	7.9	*(0.31)*
	Mean Usual Intake as a Percent of Adequate Intake (AI)[1]											
Children												
1 year old	785	97.4	*(4.05)*	375	101.6	*(6.31)*	193	106.1	*(8.59)*	191	90.8	*(6.20)*
2 years old	784	114.4	*(6.93)*	307	121.2	*(15.00)*	219	120.7	*(8.00)*	220	102.6	*(7.23)*
3 years old	518	128.5	*(4.83)*	192	138.5	*(11.32)*	171	135.4	*(8.82)*	131	112.9	*(8.06)*
4 years old	499	99.1	*(4.73)*	132	101.2	*(10.90)*	179	100.4	*(7.85)*	167	98.0	*(6.30)*
Total, age adjusted	2,586	109.8	*(2.62)*	1,006	115.5	*(5.64)*	762	115.5	*(4.16)*	709	* 101.1	*(3.49)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

1 Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-45—Linoleic Acid (g): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AI (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	7	3.0	3.6	4.0	4.7	6.3	8.4	9.8	10.8	12.5	*(0.35)*	*(0.33)*	*(0.28)*	*(0.24)*	*(0.40)*	*(0.38)*	*(0.37)*	*(0.44)*	*(0.58)*
2 years old	7	4.8	5.3	5.7	6.4	7.7	9.3	10.3	11.0	12.2	*(0.34)*	*(0.36)*	*(0.38)*	*(0.40)*	*(0.46)*	*(0.54)*	*(0.62)*	*(0.70)*	*(0.88)*
3 years old	7	5.7	6.3	6.7	7.3	8.7	10.4	11.3	12.1	13.2	*(0.27)*	*(0.28)*	*(0.28)*	*(0.30)*	*(0.33)*	*(0.38)*	*(0.44)*	*(0.49)*	*(0.60)*
4 years old	10	6.2	6.9	7.4	8.1	9.7	11.5	12.5	13.2	14.4	*(0.32)*	*(0.35)*	*(0.37)*	*(0.40)*	*(0.47)*	*(0.56)*	*(0.62)*	*(0.67)*	*(0.74)*
Total, age adjusted	–	3.9	4.5	5.1	5.9	7.8	10.3	11.9	13.1	15.0	*(0.13)*	*(0.14)*	*(0.14)*	*(0.15)*	*(0.20)*	*(0.25)*	*(0.31)*	*(0.38)*	*(0.49)*
WIC children																			
1 year old	7	3.1	3.8	4.2	4.9	6.6	8.7	10.1	11.2	12.9	*(0.28)*	*(0.25)*	*(0.27)*	*(0.32)*	*(0.44)*	*(0.62)*	*(0.69)*	*(0.75)*	*(0.92)*
2 years old	7	5.1	5.6	6.0	6.7	8.1	9.9	11.0	11.8	13.1	*(0.43)*	*(0.42)*	*(0.53)*	*(0.80)*	*(1.30)*	*(1.44)*	*(1.38)*	*(1.33)*	*(1.33)*
3 years old	7	5.9	6.6	7.0	7.8	9.3	11.2	12.4	13.3	14.8	*(0.44)*	*(0.47)*	*(0.49)*	*(0.53)*	*(0.68)*	*(0.97)*	*(1.21)*	*(1.42)*	*(1.82)*
4 years old	10	6.3	6.9	7.4	8.1	9.8	11.8	13.0	13.8	15.0	*(0.60)*	*(0.69)*	*(0.77)*	*(0.91)*	*(1.18)*	*(1.39)*	*(1.42)*	*(1.42)*	*(1.43)*
Total, age adjusted	–	3.9	4.6	5.1	6.0	8.0	10.6	12.3	13.6	15.7	*(0.18)*	*(0.20)*	*(0.22)*	*(0.25)*	*(0.37)*	*(0.49)*	*(0.60)*	*(0.73)*	*(0.97)*
Income-eligible nonparticipating children																			
1 year old	7	2.9	3.6	4.1	4.9	6.8	9.3	10.9	12.0	14.0	*(0.42)*	*(0.48)*	*(0.53)*	*(0.58)*	*(0.67)*	*(0.86)*	*(0.91)*	*(0.88)*	*(1.00)*
2 years old	7	5.4	5.9	6.3	6.9	8.1	9.7	10.7	11.4	12.6	*(0.35)*	*(0.35)*	*(0.37)*	*(0.41)*	*(0.56)*	*(0.81)*	*(0.96)*	*(1.02)*	*(1.07)*
3 years old	7	6.2	6.8	7.2	7.8	9.2	10.8	11.8	12.5	13.7	*(0.35)*	*(0.37)*	*(0.40)*	*(0.44)*	*(0.56)*	*(0.76)*	*(0.91)*	*(1.03)*	*(1.25)*
4 years old	10	6.2	6.9	7.4	8.2	9.8	11.6	12.7	13.5	14.7	*(0.52)*	*(0.56)*	*(0.59)*	*(0.64)*	*(0.76)*	*(0.94)*	*(1.07)*	*(1.18)*	*(1.36)*
Total, age adjusted	–	4.1	4.9	5.4	6.4	8.4	11.0	12.5	13.7	15.6	*(0.21)*	*(0.22)*	*(0.23)*	*(0.26)*	*(0.33)*	*(0.42)*	*(0.50)*	*(0.56)*	*(0.70)*
Higher-income nonparticipating children																			
1 year old	7	3.0	3.5	3.9	4.5	5.9	7.7	8.9	9.8	11.3	*(0.29)*	*(0.31)*	*(0.33)*	*(0.35)*	*(0.41)*	*(0.53)*	*(0.65)*	*(0.77)*	*(1.01)*
2 years old	7	4.5	5.0	5.3	5.8	7.0	8.3	9.1	9.7	10.6	*(0.35)*	*(0.38)*	*(0.40)*	*(0.43)*	*(0.50)*	*(0.59)*	*(0.65)*	*(0.70)*	*(0.80)*
3 years old	7	5.1	5.6	5.9	6.5	7.7	9.1	9.9	10.5	11.4	*(0.40)*	*(0.43)*	*(0.46)*	*(0.49)*	*(0.56)*	*(0.65)*	*(0.70)*	*(0.74)*	*(0.82)*
4 years old	10	6.2	6.9	7.4	8.1	9.6	11.3	12.3	13.0	14.0	*(0.50)*	*(0.51)*	*(0.52)*	*(0.55)*	*(0.63)*	*(0.76)*	*(0.84)*	*(0.90)*	*(1.01)*
Total, age adjusted	–	3.7	4.3	4.8	5.6	7.4	9.6	11.0	12.0	13.6	*(0.18)*	*(0.20)*	*(0.21)*	*(0.23)*	*(0.29)*	*(0.42)*	*(0.49)*	*(0.54)*	*(0.63)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-46—Linoleic Acid (% of energy intake)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	4.30	*(0.13)*	375	4.52	*(0.20)*	193	4.30	*(0.24)*	191	4.18	*(0.25)*
2 years old	784	4.60	*(0.16)*	307	4.79	*(0.26)*	219	4.60	*(0.23)*	220	4.59	*(0.20)*
3 years old	518	5.02	*(0.16)*	192	4.94	*(0.22)*	171	5.32	*(0.22)*	131	4.81	*(0.32)*
4 years old	499	5.12	*(0.18)*	132	5.47	*(0.35)*	179	4.99	*(0.25)*	167	5.11	*(0.24)*
Total, age adjusted	2,586	4.76	*(0.09)*	1,006	4.85	*(0.13)*	762	4.85	*(0.13)*	709	4.68	*(0.14)*
	Percent of Children with Usual Intake Below the AMDR[1]											
Children												
1 year old	785	74.7	*(3.79)*	375	69.2	*(5.97)*	193	73.7	*(6.21)*	191	79.2	*(6.74)*
2 years old	784	71.5	*(9.54)*	307	60.9	*(12.10)*	219	73.8	*(10.80)*	220	72.3	*(9.04)*
3 years old	518	48.9 u	*(16.00)*	192	57.1 u	*(23.00)*	171	19.6 u	*(15.20)*	131	68.4 u	*(27.80)*
4 years old	499	44.8	*(10.10)*	132	26.5 u	*(15.40)*	179	52.5	*(14.90)*	167	45.6	*(13.30)*
Total, age adjusted	2,586	59.8	*(5.39)*	1,006	53.2	*(7.71)*	762	54.8	*(6.19)*	709	66.2	*(8.21)*
	Percent of Children with Usual Intake Above the AMDR[1]											
Children												
1 year old	785	0.0	*(0.00)*	375	0.2 u	*(0.20)*	193	0.0	*(0.00)*	191	0.0	*(0.00)*
2 years old	784	0.0	*(0.00)*	307	0.0	*(0.00)*	219	0.0	*(0.00)*	220	0.0	*(0.00)*
3 years old	518	0.0	*(0.00)*	192	0.0	*(0.00)*	171	0.0	*(0.00)*	131	0.0	*(0.00)*
4 years old	499	0.0	*(0.00)*	132	0.0	*(0.00)*	179	0.0	*(0.00)*	167	0.0	*(0.00)*
Total, age adjusted	2,586	0.0	*(0.00)*	1,006	0.0 u	*(0.05)*	762	0.0	*(0.00)*	709	0.0	*(0.00)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-47—Linoleic Acid (% of energy intake): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AMDR[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	5-10	2.58	2.88	3.09	3.44	4.17	5.01	5.52	5.89	6.47	*(0.11)*	*(0.11)*	*(0.11)*	*(0.12)*	*(0.13)*	*(0.16)*	*(0.18)*	*(0.19)*	*(0.22)*
2 years old	5-10	3.44	3.66	3.82	4.06	4.55	5.09	5.40	5.62	5.97	*(0.20)*	*(0.20)*	*(0.19)*	*(0.17)*	*(0.17)*	*(0.25)*	*(0.30)*	*(0.31)*	*(0.32)*
3 years old	5-10	4.39	4.52	4.61	4.75	5.01	5.28	5.43	5.53	5.69	*(0.15)*	*(0.15)*	*(0.15)*	*(0.15)*	*(0.16)*	*(0.16)*	*(0.17)*	*(0.17)*	*(0.17)*
4 years old	5-10	4.02	4.24	4.39	4.63	5.09	5.58	5.86	6.05	6.33	*(0.15)*	*(0.16)*	*(0.16)*	*(0.17)*	*(0.18)*	*(0.20)*	*(0.21)*	*(0.22)*	*(0.23)*
Total, age adjusted	–	3.69	3.91	4.05	4.28	4.73	5.20	5.47	5.66	5.94	*(0.08)*	*(0.08)*	*(0.08)*	*(0.09)*	*(0.09)*	*(0.10)*	*(0.11)*	*(0.11)*	*(0.12)*
WIC children																			
1 year old	5-10	2.71	3.04	3.27	3.63	4.37	5.24	5.78	6.18	6.84	*(0.17)*	*(0.15)*	*(0.14)*	*(0.14)*	*(0.18)*	*(0.25)*	*(0.30)*	*(0.34)*	*(0.42)*
2 years old	5-10	3.42	3.66	3.84	4.13	4.74	5.39	5.76	6.00	6.35	*(0.21)*	*(0.23)*	*(0.25)*	*(0.27)*	*(0.28)*	*(0.36)*	*(0.42)*	*(0.44)*	*(0.46)*
3 years old	5-10	4.33	4.46	4.55	4.68	4.93	5.19	5.34	5.44	5.59	*(0.22)*	*(0.22)*	*(0.22)*	*(0.22)*	*(0.23)*	*(0.23)*	*(0.23)*	*(0.23)*	*(0.23)*
4 years old	5-10	4.36	4.58	4.73	4.97	5.43	5.93	6.21	6.40	6.69	*(0.27)*	*(0.28)*	*(0.30)*	*(0.31)*	*(0.35)*	*(0.40)*	*(0.42)*	*(0.44)*	*(0.45)*
Total, age adjusted	–	3.76	3.98	4.13	4.36	4.81	5.30	5.58	5.77	6.07	*(0.11)*	*(0.12)*	*(0.12)*	*(0.12)*	*(0.14)*	*(0.15)*	*(0.15)*	*(0.16)*	*(0.17)*
Income-eligible nonparticipating children																			
1 year old	5-10	2.49	2.81	3.05	3.42	4.18	5.05	5.57	5.94	6.51	*(0.23)*	*(0.24)*	*(0.24)*	*(0.24)*	*(0.25)*	*(0.26)*	*(0.27)*	*(0.29)*	*(0.34)*
2 years old	5-10	3.57	3.75	3.87	4.07	4.50	5.03	5.37	5.61	6.00	*(0.14)*	*(0.15)*	*(0.16)*	*(0.19)*	*(0.24)*	*(0.28)*	*(0.31)*	*(0.33)*	*(0.37)*
3 years old	5-10	4.73	4.85	4.94	5.06	5.31	5.57	5.71	5.81	5.96	*(0.18)*	*(0.19)*	*(0.19)*	*(0.20)*	*(0.22)*	*(0.24)*	*(0.25)*	*(0.26)*	*(0.27)*
4 years old	5-10	3.94	4.15	4.29	4.52	4.96	5.43	5.70	5.89	6.17	*(0.21)*	*(0.22)*	*(0.22)*	*(0.23)*	*(0.25)*	*(0.28)*	*(0.30)*	*(0.32)*	*(0.34)*
Total, age adjusted	–	3.79	4.00	4.15	4.38	4.82	5.29	5.55	5.74	6.02	*(0.12)*	*(0.12)*	*(0.12)*	*(0.12)*	*(0.13)*	*(0.15)*	*(0.15)*	*(0.16)*	*(0.17)*
Higher-income nonparticipating children																			
1 year old	5-10	2.63	2.89	3.07	3.38	4.03	4.82	5.31	5.67	6.25	*(0.16)*	*(0.18)*	*(0.19)*	*(0.21)*	*(0.26)*	*(0.30)*	*(0.33)*	*(0.36)*	*(0.40)*
2 years old	5-10	3.44	3.67	3.83	4.07	4.55	5.06	5.35	5.55	5.86	*(0.19)*	*(0.20)*	*(0.20)*	*(0.20)*	*(0.20)*	*(0.21)*	*(0.22)*	*(0.22)*	*(0.23)*
3 years old	5-10	4.14	4.28	4.37	4.52	4.80	5.09	5.25	5.36	5.52	*(0.28)*	*(0.29)*	*(0.30)*	*(0.31)*	*(0.32)*	*(0.34)*	*(0.36)*	*(0.36)*	*(0.38)*
4 years old	5-10	3.97	4.19	4.35	4.60	5.08	5.59	5.88	6.07	6.36	*(0.22)*	*(0.23)*	*(0.23)*	*(0.24)*	*(0.25)*	*(0.26)*	*(0.28)*	*(0.29)*	*(0.31)*
Total, age adjusted	–	3.63	3.83	3.98	4.20	4.65	5.12	5.38	5.57	5.85	*(0.11)*	*(0.11)*	*(0.12)*	*(0.12)*	*(0.14)*	*(0.15)*	*(0.16)*	*(0.16)*	*(0.17)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-48—Linolenic Acid (g)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	0.85	*(0.03)*	375	0.86	*(0.05)*	193	0.89	*(0.05)*	191	0.83	*(0.05)*
2 years old	784	0.84	*(0.03)*	307	0.93	*(0.05)*	219	0.91	*(0.06)*	220	0.77	*(0.07)*
3 years old	518	0.93	*(0.05)*	192	1.06	*(0.10)*	171	0.96	*(0.08)*	131	* 0.80	*(0.07)*
4 years old	499	0.97	*(0.05)*	132	1.01	*(0.09)*	179	1.01	*(0.10)*	167	0.94	*(0.07)*
Total, age adjusted	2,586	0.89	*(0.02)*	1,006	0.95	*(0.04)*	762	0.95	*(0.04)*	709	* 0.84	*(0.03)*
	Mean Usual Intake as a Percent of Adequate Intake (AI)[1]											
Children												
1 year old	785	121.6	*(4.10)*	375	122.6	*(7.82)*	193	127.4	*(7.36)*	191	119.2	*(7.21)*
2 years old	784	120.3	*(4.11)*	307	132.5	*(7.81)*	219	129.6	*(8.09)*	220	110.7	*(9.61)*
3 years old	518	132.9	*(6.49)*	192	151.2	*(14.86)*	171	137.5	*(11.89)*	131	* 114.9	*(10.34)*
4 years old	499	107.5	*(5.08)*	132	111.8	*(9.97)*	179	112.6	*(10.73)*	167	104.0	*(7.66)*
Total, age adjusted	2,586	120.5	*(2.52)*	1,006	129.4	*(5.26)*	762	126.7	*(4.86)*	709	* 112.1	*(4.39)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-49—Linolenic Acid (g): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AI (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	0.7	0.44	0.51	0.56	0.64	0.81	1.02	1.15	1.25	1.40	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*
2 years old	0.7	0.50	0.55	0.60	0.66	0.81	0.98	1.10	1.18	1.31	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*
3 years old	0.7	0.62	0.68	0.72	0.78	0.91	1.05	1.14	1.21	1.31	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.09)*
4 years old	0.9	0.62	0.68	0.73	0.80	0.94	1.11	1.21	1.28	1.39	*(0.03)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.05)*	*(0.06)*	*(0.06)*	*(0.06)*
Total, age adjusted	–	0.45	0.52	0.57	0.66	0.85	1.08	1.23	1.33	1.51	*(0.01)*	*(0.01)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*
WIC children																			
1 year old	0.7	0.42	0.49	0.54	0.62	0.80	1.04	1.19	1.30	1.49	*(0.03)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.08)*	*(0.10)*
2 years old	0.7	0.51	0.58	0.64	0.72	0.89	1.10	1.22	1.31	1.46	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.05)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.10)*
3 years old	0.7	0.68	0.74	0.79	0.86	1.02	1.22	1.34	1.42	1.56	*(0.07)*	*(0.08)*	*(0.08)*	*(0.08)*	*(0.09)*	*(0.14)*	*(0.19)*	*(0.22)*	*(0.27)*
4 years old	0.9	0.64	0.70	0.75	0.82	0.98	1.16	1.27	1.34	1.46	*(0.06)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.10)*	*(0.11)*	*(0.11)*	*(0.11)*	*(0.11)*
Total, age adjusted	–	0.44	0.52	0.58	0.67	0.89	1.15	1.32	1.45	1.65	*(0.03)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.06)*	*(0.07)*	*(0.10)*
Income-eligible nonparticipating children																			
1 year old	0.7	0.46	0.53	0.58	0.67	0.85	1.07	1.21	1.31	1.46	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.07)*	*(0.08)*	*(0.09)*	*(0.10)*
2 years old	0.7	0.56	0.62	0.66	0.72	0.86	1.05	1.17	1.27	1.42	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.08)*	*(0.10)*
3 years old	0.7	0.65	0.71	0.75	0.81	0.94	1.09	1.18	1.24	1.35	*(0.04)*	*(0.05)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.10)*	*(0.12)*	*(0.14)*	*(0.18)*
4 years old	0.9	0.65	0.71	0.76	0.83	0.99	1.17	1.27	1.34	1.46	*(0.07)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.12)*	*(0.13)*	*(0.13)*	*(0.13)*	*(0.13)*
Total, age adjusted	–	0.49	0.56	0.61	0.70	0.89	1.13	1.29	1.41	1.60	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.05)*	*(0.06)*	*(0.07)*	*(0.09)*
Higher-income nonparticipating children																			
1 year old	0.7	0.47	0.54	0.58	0.65	0.80	0.98	1.09	1.18	1.30	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*	*(0.06)*	*(0.08)*	*(0.09)*	*(0.10)*
2 years old	0.7	0.46	0.52	0.55	0.62	0.75	0.91	1.00	1.07	1.17	*(0.05)*	*(0.05)*	*(0.05)*	*(0.05)*	*(0.09)*	*(0.10)*	*(0.09)*	*(0.09)*	*(0.08)*
3 years old	0.7	0.55	0.60	0.64	0.69	0.80	0.91	0.97	1.01	1.08	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*	*(0.07)*	*(0.08)*	*(0.08)*	*(0.09)*	*(0.10)*
4 years old	0.9	0.61	0.66	0.71	0.77	0.91	1.07	1.17	1.24	1.34	*(0.05)*	*(0.06)*	*(0.06)*	*(0.06)*	*(0.07)*	*(0.08)*	*(0.09)*	*(0.09)*	*(0.10)*
Total, age adjusted	–	0.44	0.51	0.55	0.63	0.80	1.00	1.13	1.22	1.36	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.05)*	*(0.05)*	*(0.06)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] Adequate Intake (AI) is the approximate intake of the nutrient that appears to be adequate for all individuals in the population group. Mean intake at or above the AI implies a low prevalence of inadequate intake.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-50—Linolenic Acid (% of energy intake)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
Mean Usual Intake												
Children												
1 year old	785	0.55	*(0.01)*	375	0.56	*(0.03)*	193	0.54	*(0.02)*	191	0.57	*(0.02)*
2 years old	784	0.50	*(0.01)*	307	0.52	*(0.02)*	219	0.50	*(0.02)*	220	0.50	*(0.03)*
3 years old	518	0.51	*(0.02)*	192	0.53	*(0.03)*	171	0.53	*(0.03)*	131	0.48	*(0.04)*
4 years old	499	0.50	*(0.02)*	132	0.55	*(0.03)*	179	0.50	*(0.03)*	167	0.49	*(0.03)*
Total, age adjusted	2,586	0.52	*(0.01)*	1,006	0.54	*(0.01)*	762	0.52	*(0.02)*	709	0.51	*(0.01)*
Percent of Children with Usual Intake Below the AMDR[1]												
Children												
1 year old	785	66.0	*(3.51)*	375	66.3	*(6.45)*	193	69.7	*(7.62)*	191	61.1	*(6.96)*
2 years old	784	81.3	*(5.75)*	307	77.3	*(6.02)*	219	82.6	*(5.75)*	220	81.5	*(6.10)*
3 years old	518	100.0	*(0.30)*	192	98.8	*(2.65)*	171	99.2	*(2.83)*	131	100.0	*(0.00)*
4 years old	499	90.4	*(4.94)*	132	77.8	*(12.60)*	179	93.0	*(5.30)*	167	92.2	*(6.00)*
Total, age adjusted	2,586	84.5	*(2.09)*	1,006	80.0	*(3.95)*	762	86.2	*(2.82)*	709	83.8	*(2.76)*
Percent of Children with Usual Intake Above the AMDR[1]												
Children												
1 year old	785	0.1 u	*(0.18)*	375	0.4 u	*(0.48)*	193	0.0	*(0.00)*	191	0.0	*(0.00)*
2 years old	784	0.0	*(0.00)*	307	0.0 u	*(0.04)*	219	0.0	*(0.00)*	220	0.0	*(0.00)*
3 years old	518	0.0	*(0.00)*	192	0.0	*(0.00)*	171	0.0	*(0.00)*	131	0.0	*(0.00)*
4 years old	499	0.0	*(0.00)*	132	0.0	*(0.00)*	179	0.0	*(0.00)*	167	0.0	*(0.00)*
Total, age adjusted	2,586	0.0 u	*(0.04)*	1,006	0.1 u	*(0.12)*	762	0.0	*(0.00)*	709	0.0	*(0.00)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-51—Linolenic Acid (% of energy intake): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AMDR[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	0.6-1.2	0.35	0.39	0.41	0.46	0.54	0.64	0.69	0.73	0.79	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.02)*	*(0.02)*	*(0.03)*
2 years old	0.6-1.2	0.33	0.36	0.38	0.42	0.48	0.57	0.62	0.66	0.73	*(0.02)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*
3 years old	0.6-1.2	0.46	0.47	0.48	0.49	0.50	0.52	0.53	0.54	0.55	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*
4 years old	0.6-1.2	0.39	0.41	0.43	0.45	0.50	0.55	0.58	0.60	0.63	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*
Total, age adjusted	–	0.40	0.42	0.44	0.46	0.51	0.56	0.59	0.62	0.65	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.02)*
WIC children																			
1 year old	0.6-1.2	0.34	0.37	0.40	0.45	0.54	0.64	0.70	0.75	0.84	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.04)*	*(0.05)*	*(0.07)*
2 years old	0.6-1.2	0.35	0.38	0.40	0.43	0.50	0.59	0.64	0.69	0.75	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.05)*
3 years old	0.6-1.2	0.48	0.49	0.49	0.50	0.52	0.55	0.56	0.57	0.58	*(0.02)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*
4 years old	0.6-1.2	0.43	0.45	0.47	0.49	0.54	0.59	0.62	0.65	0.69	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.05)*
Total, age adjusted	–	0.41	0.44	0.45	0.48	0.53	0.59	0.62	0.65	0.68	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*
Income-eligible nonparticipating children																			
1 year old	0.6-1.2	0.35	0.39	0.41	0.46	0.54	0.62	0.66	0.70	0.75	*(0.03)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*
2 years old	0.6-1.2	0.34	0.37	0.39	0.42	0.48	0.56	0.61	0.65	0.71	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*
3 years old	0.6-1.2	0.48	0.49	0.50	0.51	0.53	0.55	0.56	0.56	0.58	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*
4 years old	0.6-1.2	0.41	0.43	0.44	0.46	0.50	0.54	0.57	0.59	0.61	*(0.02)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*
Total, age adjusted	–	0.41	0.43	0.44	0.47	0.51	0.56	0.59	0.61	0.64	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*
Higher-income nonparticipating children																			
1 year old	0.6-1.2	0.37	0.41	0.43	0.48	0.56	0.65	0.70	0.73	0.78	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.04)*
2 years old	0.6-1.2	0.34	0.36	0.38	0.42	0.48	0.57	0.62	0.66	0.71	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.04)*	*(0.04)*
3 years old	0.6-1.2	0.44	0.44	0.45	0.46	0.48	0.50	0.50	0.51	0.52	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*	*(0.04)*
4 years old	0.6-1.2	0.38	0.40	0.42	0.44	0.49	0.54	0.57	0.59	0.62	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.03)*	*(0.04)*
Total, age adjusted	–	0.39	0.42	0.43	0.46	0.50	0.56	0.58	0.60	0.64	*(0.01)*	*(0.01)*	*(0.01)*	*(0.01)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-52—Protein (g)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Protein (g), Mean Usual Intake											
Children												
1 year old	785	51.9	*(1.65)*	375	52.1	*(2.20)*	193	55.3	*(3.17)*	191	50.5	*(2.74)*
2 years old	784	53.7	*(1.50)*	307	56.0	*(2.55)*	219	56.3	*(2.53)*	220	50.7	*(2.21)*
3 years old	518	55.3	*(1.71)*	192	58.8	*(3.97)*	171	55.2	*(2.58)*	131	50.9	*(2.96)*
4 years old	499	57.8	*(1.52)*	132	57.0	*(4.52)*	179	61.8	*(3.53)*	167	55.2	*(1.94)*
Total, age adjusted	2,586	54.6	*(0.92)*	1,006	55.6	*(1.72)*	762	57.3	*(1.49)*	709	51.9	*(1.35)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-53—Protein (g/kg body weight)[1]

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	4.33	*(0.138)*	375	4.34	*(0.184)*	193	4.61	*(0.265)*	191	4.21	*(0.228)*
2 years old	674	4.44	*(0.145)*	269	4.64	*(0.252)*	192	4.58	*(0.255)*	183	4.19	*(0.202)*
3 years old	486	4.62	*(0.154)*	179	4.96	*(0.435)*	164	4.59	*(0.239)*	119	4.24	*(0.302)*
4 years old	483	3.21	*(0.093)*	126	3.28	*(0.303)*	174	3.41	*(0.185)*	164	3.05	*(0.124)*
Total, age adjusted	2,428	4.14	*(0.083)*	949	4.36	*(0.161)*	723	4.25	*(0.122)*	657	* 3.87	*(0.122)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[2]											
Children												
1 year old	785	100.0 u	*(0.00)*	375	100.0 u	*(0.00)*	193	100.0 u	*(0.00)*	191	100.0 u	*(0.00)*
2 years old	674	100.0 u	*(0.00)*	269	100.0 u	*(0.00)*	192	100.0 u	*(0.00)*	183	100.0 u	*(0.00)*
3 years old	486	100.0 u	*(0.00)*	179	100.0 u	*(0.00)*	164	100.0 u	*(0.00)*	119	100.0 u	*(0.00)*
4 years old	483	100.0 u	*(0.00)*	126	100.0 u	*(0.00)*	174	100.0 u	*(0.00)*	164	100.0 u	*(0.00)*
Total, age adjusted	2,428	100.0 u	*(0.00)*	949	100.0 u	*(0.00)*	723	100.0 u	*(0.00)*	657	100.0 u	*(0.00)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 Protein measured as g/kg body weight follows the method used by USDA/ARS, *What We Eat in America* (2005). For children age 1-3 years, the reference weight of 12 kg is used. For children age 4 years, actual body weight is used if BMI is in healthy range, otherwise the weight that places the individual at the nearest endpoint of the healthy range was used. Healthy range is defined as the 5th to 85th percentile of the CDC BMI-for-age growth chart.

2 The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-54—Protein (g/kg body weight): Distribution of Usual Intake[1]

	Percentiles										Standard errors of percentiles								
	EAR (mg/d)[2]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	0.87	2.54	2.88	3.12	3.49	4.21	5.04	5.54	5.91	6.51	*(0.12)*	*(0.11)*	*(0.11)*	*(0.12)*	*(0.13)*	*(0.16)*	*(0.19)*	*(0.20)*	*(0.24)*
2 years old	0.87	2.68	2.99	3.21	3.56	4.30	5.17	5.69	6.07	6.67	*(0.11)*	*(0.11)*	*(0.12)*	*(0.12)*	*(0.14)*	*(0.18)*	*(0.22)*	*(0.26)*	*(0.33)*
3 years old	0.87	2.94	3.26	3.48	3.82	4.51	5.29	5.76	6.12	6.69	*(0.17)*	*(0.16)*	*(0.16)*	*(0.16)*	*(0.15)*	*(0.16)*	*(0.17)*	*(0.19)*	*(0.23)*
4 years old	0.76	1.98	2.21	2.37	2.62	3.11	3.69	4.05	4.33	4.78	*(0.12)*	*(0.09)*	*(0.09)*	*(0.10)*	*(0.10)*	*(0.13)*	*(0.16)*	*(0.17)*	*(0.19)*
Total, age adjusted	–	2.41	2.72	2.94	3.28	3.99	4.84	5.36	5.75	6.38	*(0.07)*	*(0.08)*	*(0.09)*	*(0.09)*	*(0.08)*	*(0.10)*	*(0.11)*	*(0.13)*	*(0.16)*
WIC children																			
1 year old	0.87	2.54	2.89	3.13	3.50	4.23	5.06	5.56	5.93	6.52	*(0.15)*	*(0.16)*	*(0.16)*	*(0.17)*	*(0.18)*	*(0.22)*	*(0.26)*	*(0.29)*	*(0.34)*
2 years old	0.87	2.71	3.07	3.32	3.73	4.55	5.46	5.97	6.32	6.85	*(0.20)*	*(0.21)*	*(0.22)*	*(0.24)*	*(0.27)*	*(0.29)*	*(0.30)*	*(0.32)*	*(0.37)*
3 years old	0.87	3.18	3.55	3.80	4.17	4.87	5.66	6.13	6.49	7.07 u	*(0.30)*	*(0.21)*	*(0.23)*	*(0.31)*	*(0.26)*	*(0.60)*	*(1.07)*	*(1.58)*	*(2.31)*
4 years old	0.76	1.93	2.14	2.30	2.55	3.11	3.83	4.28	4.63	5.20	*(0.20)*	*(0.21)*	*(0.22)*	*(0.26)*	*(0.36)*	*(0.36)*	*(0.36)*	*(0.37)*	*(0.41)*
Total, age adjusted	–	2.45	2.79	3.04	3.43	4.24	5.16	5.70	6.08	6.68	*(0.12)*	*(0.12)*	*(0.13)*	*(0.14)*	*(0.15)*	*(0.18)*	*(0.22)*	*(0.25)*	*(0.34)*
Income-eligible nonparticipating children																			
1 year old	0.87	2.54	2.90	3.16	3.57	4.45	5.47	6.07	6.51	7.21	*(0.25)*	*(0.30)*	*(0.32)*	*(0.29)*	*(0.26)*	*(0.41)*	*(0.44)*	*(0.45)*	*(0.56)*
2 years old	0.87	2.81	3.15	3.38	3.74	4.48	5.32	5.82	6.17	6.71	*(0.22)*	*(0.21)*	*(0.21)*	*(0.21)*	*(0.26)*	*(0.31)*	*(0.34)*	*(0.36)*	*(0.40)*
3 years old	0.87	2.86	3.16	3.38	3.73	4.46	5.31	5.82	6.19	6.78	*(0.19)*	*(0.19)*	*(0.19)*	*(0.19)*	*(0.23)*	*(0.30)*	*(0.35)*	*(0.41)*	*(0.51)*
4 years old	0.76	2.04	2.29	2.47	2.75	3.29	3.94	4.35	4.66	5.19	*(0.21)*	*(0.19)*	*(0.18)*	*(0.18)*	*(0.19)*	*(0.22)*	*(0.26)*	*(0.30)*	*(0.40)*
Total, age adjusted	–	2.42	2.75	2.98	3.35	4.10	4.99	5.54	5.95	6.62	*(0.13)*	*(0.11)*	*(0.11)*	*(0.10)*	*(0.12)*	*(0.15)*	*(0.17)*	*(0.19)*	*(0.23)*
Higher-income nonparticipating children																			
1 year old	0.87	2.55	2.88	3.10	3.45	4.14	4.89	5.32	5.62	6.07	*(0.22)*	*(0.21)*	*(0.21)*	*(0.20)*	*(0.22)*	*(0.25)*	*(0.28)*	*(0.30)*	*(0.36)*
2 years old	0.87	2.65	2.90	3.09	3.39	4.04	4.83	5.32	5.68	6.26	*(0.15)*	*(0.16)*	*(0.17)*	*(0.18)*	*(0.20)*	*(0.24)*	*(0.29)*	*(0.33)*	*(0.41)*
3 years old	0.87	2.72	3.04	3.27	3.60	4.17	4.76	5.17	5.49	6.02	*(0.48)*	*(0.28)*	*(0.40)*	*(0.65)*	*(0.46)*	*(0.41)*	*(0.52)*	*(0.52)*	*(0.52)*
4 years old	0.76	1.97	2.18	2.33	2.55	3.01	3.50	3.78	3.98	4.28	*(0.14)*	*(0.12)*	*(0.11)*	*(0.11)*	*(0.13)*	*(0.17)*	*(0.19)*	*(0.21)*	*(0.25)*
Total, age adjusted	–	2.34	2.62	2.82	3.12	3.75	* 4.49	4.94	5.27	5.81	*(0.09)*	*(0.10)*	*(0.10)*	*(0.10)*	*(0.11)*	*(0.15)*	*(0.18)*	*(0.21)*	*(0.24)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 Protein measured as g/kg body weight follows the method used by USDA/ARS, *What We Eat in America* (2005). For children age 1–3 years, the reference weight of 12 kg is used. For children age 4 years, actual body weight is used if BMI is in healthy range, otherwise the weight that places the individual at the nearest endpoint of the healthy range was used. Healthy range is defined as the 5th to 85th percentile of the CDC BMI-for-age growth chart.

2 The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-55—Protein (% of energy intake)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
Mean Usual Intake												
Children												
1 year old	785	15.0	*(0.26)*	375	15.1	*(0.36)*	193	15.0	*(0.64)*	191	15.2	*(0.44)*
2 years old	784	14.4	*(0.24)*	307	14.2	*(0.40)*	219	14.1	*(0.49)*	220	14.7	*(0.55)*
3 years old	518	13.8	*(0.32)*	192	13.7	*(0.46)*	171	13.9	*(0.45)*	131	13.7	*(0.58)*
4 years old	499	13.4	*(0.27)*	132	13.9	*(0.38)*	179	13.8	*(0.52)*	167	13.0	*(0.49)*
Total, age adjusted	2,586	14.2	*(0.19)*	1,006	14.3	*(0.20)*	762	14.2	*(0.32)*	709	14.1	*(0.23)*
Percent of Children with Usual Intake Below the AMDR[1]												
Children												
1 year old	785	0.0	*(0.00)*	375	0.0	*(0.00)*	193	0.0	*(0.00)*	191	0.0	*(0.00)*
2 years old	784	0.0	*(0.00)*	307	0.0	*(0.00)*	219	0.0	*(0.00)*	220	0.0	*(0.00)*
3 years old	518	0.0	*(0.00)*	192	0.0	*(0.00)*	171	0.0	*(0.00)*	131	0.0	*(0.00)*
4 years old	499	2.5 u	*(1.21)*	132	0.6 u	*(0.54)*	179	1.9 u	*(1.80)*	167	4.8 u	*(2.64)*
Total, age adjusted	2,586	0.6 u	*(0.31)*	1,006	0.2 u	*(0.14)*	762	0.5 u	*(0.46)*	709	1.2 u	*(0.67)*
Percent of Children with Usual Intake Above the AMDR[1]												
Children												
1 year old	785	2.0 u	*(0.92)*	375	1.8 u	*(1.08)*	193	4.1 u	*(2.65)*	191	1.1 u	*(0.77)*
2 years old	784	0.4 u	*(0.45)*	307	0.4 u	*(0.59)*	219	0.2 u	*(0.22)*	220	0.6 u	*(1.13)*
3 years old	518	0.3 u	*(0.19)*	192	0.2 u	*(0.34)*	171	0.0 u	*(0.20)*	131	0.5 u	*(0.54)*
4 years old	499	0.0	*(0.00)*	132	0.0	*(0.00)*	179	0.0	*(0.00)*	167	0.0	*(0.00)*
Total, age adjusted	2,586	0.6 u	*(0.26)*	1,006	0.6 u	*(0.32)*	762	1.1 u	*(0.66)*	709	0.5 u	*(0.36)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-56—Protein (% of energy intake): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AMDR[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	5-20	11.3	12.1	12.6	13.4	15.0	16.6	17.4	18.0	18.9	*(0.25)*	*(0.24)*	*(0.24)*	*(0.24)*	*(0.26)*	*(0.31)*	*(0.35)*	*(0.38)*	*(0.42)*
2 years old	5-20	11.6	12.1	12.5	13.1	14.3	15.5	16.3	16.8	17.5	*(0.22)*	*(0.23)*	*(0.23)*	*(0.23)*	*(0.23)*	*(0.28)*	*(0.32)*	*(0.36)*	*(0.45)*
3 years old	5-20	10.8	11.4	11.8	12.5	13.7	15.0	15.7	16.2	17.0	*(0.30)*	*(0.30)*	*(0.30)*	*(0.31)*	*(0.33)*	*(0.36)*	*(0.38)*	*(0.40)*	*(0.45)*
4 years old	10-30	10.5	11.1	11.5	12.2	13.3	14.6	15.3	15.8	16.6	*(0.32)*	*(0.30)*	*(0.29)*	*(0.28)*	*(0.28)*	*(0.30)*	*(0.32)*	*(0.35)*	*(0.40)*
Total, age adjusted	–	10.7	11.4	11.9	12.7	14.1	15.6	16.4	17.0	18.0	*(0.22)*	*(0.20)*	*(0.18)*	*(0.18)*	*(0.25)*	*(0.26)*	*(0.24)*	*(0.24)*	*(0.25)*
WIC children																			
1 year old	5-20	11.4	12.2	12.7	13.5	15.0	16.6	17.4	18.0	18.9	*(0.38)*	*(0.35)*	*(0.34)*	*(0.34)*	*(0.36)*	*(0.41)*	*(0.45)*	*(0.48)*	*(0.54)*
2 years old	5-20	11.4	11.9	12.3	12.9	14.1	15.4	16.2	16.7	17.5	*(0.36)*	*(0.36)*	*(0.36)*	*(0.36)*	*(0.38)*	*(0.45)*	*(0.52)*	*(0.58)*	*(0.70)*
3 years old	5-20	10.9	11.5	11.9	12.5	13.6	14.7	15.4	15.9	16.7	*(0.43)*	*(0.43)*	*(0.43)*	*(0.43)*	*(0.46)*	*(0.50)*	*(0.54)*	*(0.58)*	*(0.69)*
4 years old	10-30	11.3	11.9	12.2	12.8	13.8	14.9	15.5	15.9	16.6	*(0.47)*	*(0.43)*	*(0.41)*	*(0.40)*	*(0.41)*	*(0.45)*	*(0.52)*	*(0.59)*	*(0.75)*
Total, age adjusted	–	11.0	11.7	12.2	12.9	14.2	15.6	16.4	17.0	18.0	*(0.23)*	*(0.22)*	*(0.22)*	*(0.21)*	*(0.20)*	*(0.21)*	*(0.23)*	*(0.26)*	*(0.31)*
Income-eligible nonparticipating children																			
1 year old	5-20	11.0	11.8	12.3	13.1	14.7	16.6	17.7	18.5	19.7	*(0.50)*	*(0.51)*	*(0.52)*	*(0.56)*	*(0.64)*	*(0.75)*	*(0.83)*	*(0.90)*	*(1.02)*
2 years old	5-20	11.3	11.9	12.3	12.9	14.1	15.3	16.0	16.5	17.2	*(0.66)*	*(0.67)*	*(0.66)*	*(0.60)*	*(0.51)*	*(0.63)*	*(0.67)*	*(0.65)*	*(0.60)*
3 years old	5-20	10.8	11.5	11.9	12.6	13.8	15.1	15.8	16.3	17.0	*(0.49)*	*(0.49)*	*(0.49)*	*(0.49)*	*(0.48)*	*(0.45)*	*(0.43)*	*(0.42)*	*(0.43)*
4 years old	10-30	10.7	11.3	11.8	12.4	13.7	15.0	15.7	16.2	17.1	*(0.60)*	*(0.58)*	*(0.57)*	*(0.55)*	*(0.54)*	*(0.53)*	*(0.55)*	*(0.59)*	*(0.69)*
Total, age adjusted	–	10.6	11.3	11.8	12.6	14.1	15.6	16.5	17.1	18.0	*(0.38)*	*(0.37)*	*(0.36)*	*(0.36)*	*(0.38)*	*(0.34)*	*(0.33)*	*(0.34)*	*(0.40)*
Higher-income nonparticipating children																			
1 year old	5-20	11.5	12.3	12.9	13.7	15.2	16.7	17.4	17.9	18.7	*(0.61)*	*(0.56)*	*(0.53)*	*(0.50)*	*(0.44)*	*(0.42)*	*(0.42)*	*(0.43)*	*(0.46)*
2 years old	5-20	12.0	12.5	12.9	13.5	14.6	15.8	16.5	17.0	17.8	*(0.33)*	*(0.33)*	*(0.36)*	*(0.44)*	*(0.58)*	*(0.64)*	*(0.70)*	*(0.79)*	*(0.99)*
3 years old	5-20	10.5	11.1	11.6	12.2	13.5	14.9	15.8	16.3	17.2	*(0.51)*	*(0.51)*	*(0.52)*	*(0.53)*	*(0.60)*	*(0.68)*	*(0.75)*	*(0.81)*	*(0.92)*
4 years old	10-30	10.0	10.7	11.1	11.7	13.0	14.3	15.0	15.5	16.3	*(0.45)*	*(0.43)*	*(0.42)*	*(0.43)*	*(0.48)*	*(0.58)*	*(0.65)*	*(0.71)*	*(0.80)*
Total, age adjusted	–	10.6	11.3	11.8	12.6	14.0	15.6	16.4	17.0	17.9	*(0.22)*	*(0.21)*	*(0.21)*	*(0.22)*	*(0.23)*	*(0.26)*	*(0.30)*	*(0.34)*	*(0.43)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-57—Carbohydrates (g)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	185	*(5.0)*	375	187	*(6.6)*	193	195	*(9.9)*	191	176	*(8.0)*
2 years old	784	212	*(5.5)*	307	225	*(10.6)*	219	224	*(8.6)*	220	* 193	*(9.2)*
3 years old	518	222	*(7.3)*	192	235	*(13.4)*	171	220	*(12.8)*	131	212	*(10.9)*
4 years old	499	243	*(6.9)*	132	225	*(16.3)*	179	243	*(14.2)*	167	249	*(9.1)*
Total, age adjusted	2,586	215	*(3.5)*	1,006	215	*(5.9)*	762	222	*(6.3)*	709	209	*(6.0)*
	Percent of Children with Usual Intake Greater than Estimated Average Requirement (EAR)[1]											
Children												
1 year old	785	97.6 u	*(0.71)*	375	97.6 u	*(0.88)*	193	97.3 u	*(1.72)*	191	97.4 u	*(1.78)*
2 years old	784	99.5 u	*(0.24)*	307	99.4 u	*(0.36)*	219	100.0 u	*(0.15)*	220	99.5 u	*(0.42)*
3 years old	518	99.8 u	*(0.15)*	192	99.7 u	*(0.35)*	171	99.7 u	*(0.33)*	131	100.0 u	*(0.22)*
4 years old	499	100.0 u	*(0.00)*	132	100.0 u	*(0.00)*	179	100.0 u	*(0.00)*	167	100.0 u	*(0.00)*
Total, age adjusted	2,586	99.2	*(0.19)*	1,006	99.2 u	*(0.25)*	762	99.2 u	*(0.44)*	709	99.2 u	*(0.46)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-58—Carbohydrates (g): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	EAR (µg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	100	112	125	135	150	180	215	236	252	277	*(4.23)*	*(4.29)*	*(4.37)*	*(4.50)*	*(4.98)*	*(5.89)*	*(6.53)*	*(7.11)*	*(8.58)*
2 years old	100	132	147	157	173	206	244	267	283	309	*(5.62)*	*(5.76)*	*(5.97)*	*(5.81)*	*(6.14)*	*(6.19)*	*(7.64)*	*(8.57)*	*(9.60)*
3 years old	100	144	158	168	185	217	254	275	290	315	*(5.83)*	*(6.25)*	*(6.89)*	*(7.65)*	*(7.81)*	*(9.07)*	*(9.83)*	*(10.10)*	*(11.30)*
4 years old	100	177	189	198	212	240	271	289	302	321	*(6.11)*	*(6.27)*	*(6.42)*	*(6.55)*	*(6.87)*	*(7.95)*	*(8.86)*	*(9.69)*	*(11.30)*
Total, age adjusted	–	131	146	157	174	209	250	274	292	319	*(2.98)*	*(3.51)*	*(3.62)*	*(3.40)*	*(4.68)*	*(4.89)*	*(6.52)*	*(6.28)*	*(6.21)*
WIC children																			
1 year old	100	113	127	137	152	182	217	238	253	277	*(5.46)*	*(5.46)*	*(5.57)*	*(5.87)*	*(6.79)*	*(8.26)*	*(9.25)*	*(10.00)*	*(11.40)*
2 years old	100	135	152	164	183	220	262	286	303	330	*(9.03)*	*(9.43)*	*(9.81)*	*(10.50)*	*(11.60)*	*(11.80)*	*(11.90)*	*(12.00)*	*(12.50)*
3 years old	100	148	165	177	195	231	270	293	310	337	*(11.40)*	*(11.10)*	*(11.60)*	*(12.70)*	*(14.40)*	*(15.20)*	*(17.30)*	*(19.90)*	*(24.10)*
4 years old	100	159	171	179	192	220	253	274	288	310	*(11.30)*	*(12.10)*	*(12.90)*	*(14.40)*	*(17.20)*	*(19.20)*	*(20.00)*	*(20.70)*	*(22.00)*
Total, age adjusted	–	128	143	155	172	208	251	277	296	325	*(4.47)*	*(4.67)*	*(4.87)*	*(5.28)*	*(6.26)*	*(7.21)*	*(7.81)*	*(8.34)*	*(9.44)*
Income-eligible nonparticipating children																			
1 year old	100	111	126	137	154	189	229	253	271	299	*(10.10)*	*(10.40)*	*(10.90)*	*(11.40)*	*(9.85)*	*(12.20)*	*(13.70)*	*(15.40)*	*(19.90)*
2 years old	100	146	160	169	185	218	257	280	297	324	*(6.82)*	*(7.04)*	*(7.22)*	*(7.52)*	*(8.28)*	*(10.80)*	*(13.70)*	*(16.10)*	*(20.70)*
3 years old	100	136	151	161	178	213	254	279	298	326	*(10.40)*	*(11.10)*	*(11.60)*	*(12.30)*	*(13.40)*	*(14.50)*	*(15.40)*	*(16.50)*	*(18.90)*
4 years old	100	175	188	197	210	239	272	292	306	328	*(12.90)*	*(12.20)*	*(12.30)*	*(12.90)*	*(14.90)*	*(16.80)*	*(17.80)*	*(18.60)*	*(20.00)*
Total, age adjusted	–	133	149	161	178	216	258	284	303	334	*(6.41)*	*(5.50)*	*(5.12)*	*(5.53)*	*(7.42)*	*(8.56)*	*(9.99)*	*(11.10)*	*(12.50)*
Higher-income nonparticipating children																			
1 year old	100	110	122	131	145	173	204	222	235	255	*(7.78)*	*(6.78)*	*(6.51)*	*(6.64)*	*(7.83)*	*(9.72)*	*(11.10)*	*(12.30)*	*(14.40)*
2 years old	100	124	137	146	160	190	222	241	254	275	*(9.46)*	*(10.30)*	*(10.40)*	*(9.59)*	*(8.56)*	*(9.78)*	*(12.00)*	*(13.80)*	*(16.20)*
3 years old	100	144	156	165	179	209	242	260	272	290	*(8.53)*	*(9.66)*	*(10.30)*	*(10.70)*	*(11.90)*	*(14.70)*	*(15.10)*	*(14.60)*	*(14.90)*
4 years old	100	187	199	208	221	247	275	291	302	319	*(8.75)*	*(7.98)*	*(7.67)*	*(7.55)*	*(8.55)*	*(11.20)*	*(13.40)*	*(15.20)*	*(18.30)*
Total, age adjusted	–	130	144	155	171	204	242	263	279	302	*(6.24)*	*(6.31)*	*(6.31)*	*(6.22)*	*(6.28)*	*(7.20)*	*(7.83)*	*(8.32)*	*(9.76)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Reference Intakes (DRI) Estimated Average Requirement (EAR) is used to assess the adequacy of intakes for population groups.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-59—Carbohydrate (% of energy intake)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
Mean Usual Intake												
Children												
1 year old	785	53.1	*(0.55)*	375	53.6	*(0.92)*	193	51.9	*(1.47)*	191	52.7	*(1.28)*
2 years old	784	55.5	*(0.58)*	307	55.4	*(0.85)*	219	55.4	*(1.21)*	220	55.2	*(1.03)*
3 years old	518	55.6	*(0.83)*	192	55.1	*(1.49)*	171	54.6	*(1.04)*	131	57.3	*(1.62)*
4 years old	499	56.3	*(0.63)*	132	54.6	*(1.32)*	179	54.7	*(1.14)*	167	* 58.0	*(0.88)*
Total, age adjusted	2,586	55.1	*(0.39)*	1,006	54.6	*(0.65)*	762	54.3	*(0.68)*	709	55.8	*(0.60)*
Percent of Children with Usual Intake Below the AMDR[1]												
Children												
1 year old	785	8.1	*(2.07)*	375	5.0 u	*(2.27)*	193	12.4 u	*(5.28)*	191	9.6 u	*(3.51)*
2 years old	784	1.3 u	*(0.59)*	307	0.9 u	*(0.48)*	219	1.4 u	*(0.80)*	220	1.6 u	*(1.24)*
3 years old	518	1.6 u	*(0.94)*	192	2.1 u	*(2.05)*	171	2.2 u	*(1.20)*	131	1.0 u	*(1.26)*
4 years old	499	0.5 u	*(0.27)*	132	0.8 u	*(1.01)*	179	1.6 u	*(1.18)*	167	0.0 u	*(0.21)*
Total, age adjusted	2,586	2.8	*(0.59)*	1,006	2.2 u	*(0.81)*	762	4.4 u	*(1.39)*	709	3.0 u	*(0.98)*
Percent of Children with Usual Intake Above the AMDR[1]												
Children												
1 year old	785	2.5 u	*(0.78)*	375	3.1 u	*(1.51)*	193	1.2 u	*(1.25)*	191	2.0 u	*(1.66)*
2 years old	784	2.8 u	*(1.08)*	307	1.4 u	*(0.98)*	219	3.1 u	*(2.80)*	220	2.3 u	*(1.19)*
3 years old	518	2.2 u	*(1.15)*	192	1.6 u	*(1.09)*	171	1.2 u	*(0.89)*	131	5.2 u	*(4.18)*
4 years old	499	2.3 u	*(0.99)*	132	0.6 u	*(0.60)*	179	1.1 u	*(0.91)*	167	5.0 u	*(2.98)*
Total, age adjusted	2,586	2.4	*(0.50)*	1,006	1.6 u	*(0.55)*	762	1.6 u	*(0.82)*	709	3.6 u	*(1.39)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-60—Carbohydrate (% of energy intake): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	AMDR[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	45-65	43.8	45.6	46.9	49.0	52.9	56.9	59.1	60.7	62.9	*(0.75)*	*(0.68)*	*(0.61)*	*(0.58)*	*(0.76)*	*(0.59)*	*(0.61)*	*(0.71)*	*(0.83)*
2 years old	45-65	47.7	49.4	50.5	52.2	55.4	58.7	60.5	61.7	63.6	*(0.78)*	*(0.68)*	*(0.63)*	*(0.59)*	*(0.64)*	*(0.67)*	*(0.69)*	*(0.72)*	*(0.81)*
3 years old	45-65	47.5	49.4	50.6	52.4	55.7	58.8	60.5	61.6	63.3	*(1.08)*	*(1.01)*	*(0.96)*	*(0.90)*	*(0.83)*	*(0.84)*	*(0.87)*	*(0.90)*	*(0.97)*
4 years old	45-65	49.2	50.8	51.8	53.4	56.3	59.2	60.8	61.9	63.5	*(0.72)*	*(0.69)*	*(0.67)*	*(0.65)*	*(0.64)*	*(0.65)*	*(0.67)*	*(0.69)*	*(0.74)*
Total, age adjusted	–	46.2	48.1	49.5	51.4	55.1	58.8	60.7	62.1	64.1	*(0.50)*	*(0.48)*	*(0.46)*	*(0.43)*	*(0.40)*	*(0.41)*	*(0.43)*	*(0.45)*	*(0.50)*
WIC children																			
1 year old	45-65	45.0	46.7	47.9	49.7	53.3	57.2	59.5	61.0	63.5	*(0.97)*	*(1.07)*	*(1.09)*	*(1.03)*	*(0.93)*	*(1.09)*	*(1.15)*	*(1.15)*	*(1.24)*
2 years old	45-65	48.3	49.8	50.9	52.5	55.4	58.4	60.0	61.1	62.7	*(0.84)*	*(0.82)*	*(0.82)*	*(0.84)*	*(0.90)*	*(0.95)*	*(0.98)*	*(1.00)*	*(1.04)*
3 years old	45-65	46.9	48.8	50.1	51.9	55.2	58.4	60.0	61.1	62.7	*(1.99)*	*(1.90)*	*(1.82)*	*(1.71)*	*(1.50)*	*(1.33)*	*(1.26)*	*(1.23)*	*(1.22)*
4 years old	45-65	48.0	49.4	50.4	51.9	54.6	57.3	58.8	59.8	61.3	*(1.63)*	*(1.56)*	*(1.53)*	*(1.47)*	*(1.36)*	*(1.27)*	*(1.28)*	*(1.32)*	*(1.40)*
Total, age adjusted	–	46.1	47.9	49.2	51.1	54.6	58.1	60.0	61.4	63.3	*(0.64)*	*(0.65)*	*(0.66)*	*(0.66)*	*(0.68)*	*(0.68)*	*(0.69)*	*(0.70)*	*(0.72)*
Income-eligible nonparticipating children																			
1 year old	45-65	42.5	44.3	45.6	47.7	51.8	56.0	58.1	59.5	61.6	*(1.10)*	*(1.31)*	*(1.52)*	*(1.77)*	*(1.74)*	*(1.51)*	*(1.51)*	*(1.55)*	*(1.72)*
2 years old	45-65	47.5	49.2	50.4	52.1	55.3	58.6	60.5	61.7	63.7	*(0.90)*	*(0.89)*	*(0.90)*	*(0.95)*	*(1.19)*	*(1.58)*	*(1.80)*	*(1.95)*	*(2.16)*
3 years old	45-65	46.8	48.5	49.7	51.4	54.6	57.8	59.4	60.6	62.2	*(1.10)*	*(1.09)*	*(1.09)*	*(1.09)*	*(1.08)*	*(1.09)*	*(1.10)*	*(1.12)*	*(1.17)*
4 years old	45-65	47.3	48.9	50.0	51.6	54.7	57.7	59.4	60.5	62.1	*(1.21)*	*(1.17)*	*(1.16)*	*(1.15)*	*(1.17)*	*(1.22)*	*(1.24)*	*(1.24)*	*(1.26)*
Total, age adjusted	–	45.3	47.2	48.5	50.5	54.3	57.9	59.9	61.2	63.2	*(0.62)*	*(0.63)*	*(0.63)*	*(0.65)*	*(0.70)*	*(0.76)*	*(0.82)*	*(0.86)*	*(0.94)*
Higher-income nonparticipating children																			
1 year old	45-65	43.2	45.1	46.5	48.6	52.7	56.6	58.7	60.1	62.3	*(1.08)*	*(1.13)*	*(1.15)*	*(1.19)*	*(1.28)*	*(1.44)*	*(1.59)*	*(1.72)*	*(1.97)*
2 years old	45-65	47.4	49.1	50.2	51.9	55.1	58.4	60.2	61.4	63.3	*(1.26)*	*(1.18)*	*(1.15)*	*(1.13)*	*(1.11)*	*(1.05)*	*(1.03)*	*(1.04)*	*(1.06)*
3 years old	45-65	49.0	51.0	52.3	54.1	57.4	60.6	62.2	63.4	65.1	*(2.33)*	*(2.10)*	*(1.96)*	*(1.78)*	*(1.58)*	*(1.63)*	*(1.72)*	*(1.78)*	*(1.89)*
4 years old	45-65	51.2	52.7	53.7	55.2	58.0	60.8	62.4	63.4	65.0	*(0.87)*	*(0.81)*	*(0.78)*	*(0.78)*	*(0.85)*	*(0.99)*	*(1.09)*	*(1.16)*	*(1.26)*
Total, age adjusted	–	46.8	48.8	50.2	52.1	55.8	59.5	61.5	62.8	64.8	*(0.97)*	*(0.87)*	*(0.79)*	*(0.69)*	*(0.63)*	*(0.58)*	*(0.62)*	*(0.68)*	*(0.80)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

1 Acceptable Macronutrient Distribution Ranges (AMDR) are the ranges of intake for macronutrients, as a percent of total food energy, associated with reduced risk of chronic disease while providing intakes of essential nutrients.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Table B-61—Cholesterol (mg)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error	Sample size	Mean	Standard error
	Mean Usual Intake											
Children												
1 year old	785	194	*(10.8)*	375	207	*(17.9)*	193	222	*(20.9)*	191	172	*(17.8)*
2 years old	784	180	*(9.3)*	307	213	*(18.8)*	219	178	*(19.3)*	220	171	*(15.9)*
3 years old	518	182	*(10.3)*	192	214	*(28.9)*	171	189	*(14.8)*	131	* 141	*(15.8)*
4 years old	499	188	*(11.5)*	132	208	*(30.0)*	179	217	*(17.6)*	167	162	*(17.7)*
Total, age adjusted	2,586	186	*(5.8)*	1,006	211	*(13.0)*	762	201	*(10.4)*	709	*** 160	*(7.3)*
	Percent of Children Meeting Dietary Guidelines Recommendation[1]											
Children												
1 year old	785	88.4	*(2.73)*	375	84.1	*(4.85)*	193	81.0	*(6.16)*	191	93.6 u	*(5.01)*
2 years old	784	95.8	*(1.45)*	307	88.1	*(5.81)*	219	96.7 u	*(2.79)*	220	96.5 u	*(3.33)*
3 years old	518	92.3	*(2.34)*	192	84.5	*(8.53)*	171	91.3 u	*(4.01)*	131	98.6 u	*(1.56)*
4 years old	499	94.3	*(2.57)*	132	88.3 u	*(7.94)*	179	88.1	*(5.88)*	167	98.1 u	*(2.51)*
Total, age adjusted	2,586	92.7	*(1.17)*	1,006	86.3	*(3.48)*	762	89.3	*(2.46)*	709	** 96.7	*(1.67)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 The Dietary Guidelines recommend that persons of all ages consume less than or equal to 300 milligrams of cholesterol daily.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes those with missing WIC participation or income. Data reflect nutrient intake from foods and do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using *C-SIDE: Software for Intake Distribution Estimation.*

Table B-62—Cholesterol (mg): Distribution of Usual Intake

	Percentiles										Standard errors of percentiles								
	Guide-line (mg/d)[1]	5th	10th	15th	25th	50th	75th	85th	90th	95th	5th	10th	15th	25th	50th	75th	85th	90th	95th
All children																			
1 year old	≤ 300	83	99	111	131	176	237	279	312	368	*(4.81)*	*(5.22)*	*(5.71)*	*(6.79)*	*(10.10)*	*(14.90)*	*(17.80)*	*(19.90)*	*(23.10)*
2 years old	≤ 300	99	112	121	137	171	214	241	260	292	*(5.84)*	*(6.38)*	*(6.80)*	*(7.51)*	*(9.15)*	*(11.20)*	*(12.40)*	*(13.30)*	*(14.80)*
3 years old	≤ 300	86	100	110	127	167	219	255	282	329	*(6.67)*	*(7.04)*	*(7.33)*	*(7.64)*	*(9.05)*	*(12.80)*	*(15.80)*	*(18.50)*	*(24.10)*
4 years old	≤ 300	105	118	128	143	178	222	251	272	307	*(5.40)*	*(6.13)*	*(6.75)*	*(7.87)*	*(10.70)*	*(14.70)*	*(17.40)*	*(19.50)*	*(22.90)*
Total, age adjusted	–	81	96	108	126	169	226	267	299	353	*(3.04)*	*(3.04)*	*(3.14)*	*(3.55)*	*(5.17)*	*(7.62)*	*(9.26)*	*(10.60)*	*(13.10)*
WIC children																			
1 year old	≤ 300	85	102	114	135	186	257	305	343	404	*(7.99)*	*(8.98)*	*(9.78)*	*(11.30)*	*(15.70)*	*(23.40)*	*(29.20)*	*(33.90)*	*(42.30)*
2 years old	≤ 300	113	129	141	160	202	254	287	310	348	*(10.60)*	*(9.56)*	*(10.00)*	*(13.10)*	*(21.60)*	*(26.20)*	*(27.20)*	*(27.90)*	*(30.10)*
3 years old	≤ 300	102	117	128	147	193	258	303	338	398	*(11.30)*	*(12.00)*	*(13.20)*	*(15.70)*	*(22.70)*	*(36.10)*	*(48.00)*	*(58.70)*	*(79.60)*
4 years old	≤ 300	108	124	135	153	195	249	284	310	351	*(17.90)*	*(20.00)*	*(21.60)*	*(24.10)*	*(29.60)*	*(36.30)*	*(40.30)*	*(43.20)*	*(48.00)*
Total, age adjusted	–	88	105	117	139	189	260	309	346	408	*(5.54)*	*(6.24)*	*(7.01)*	*(8.31)*	*(11.30)*	*(16.40)*	*(20.80)*	*(24.90)*	*(33.40)*
Income-eligible nonparticipating children																			
1 year old	≤ 300	92	110	124	148	203	275	321	357	416	*(9.74)*	*(11.60)*	*(13.00)*	*(15.30)*	*(20.30)*	*(26.90)*	*(32.10)*	*(36.70)*	*(46.10)*
2 years old	≤ 300	101	114	123	138	170	211	236	254	283	*(9.53)*	*(9.41)*	*(10.40)*	*(13.30)*	*(20.50)*	*(25.90)*	*(28.00)*	*(29.20)*	*(31.50)*
3 years old	≤ 300	93	107	117	134	174	226	262	290	339	*(9.21)*	*(9.13)*	*(9.20)*	*(9.74)*	*(12.70)*	*(18.60)*	*(24.00)*	*(29.50)*	*(42.00)*
4 years old	≤ 300	122	138	149	168	207	256	287	309	345	*(12.10)*	*(12.10)*	*(12.30)*	*(13.10)*	*(16.10)*	*(21.40)*	*(25.30)*	*(28.60)*	*(33.60)*
Total, age adjusted	–	89	105	117	137	183	246	288	320	373	*(5.14)*	*(5.77)*	*(6.33)*	*(7.35)*	*(9.75)*	*(13.00)*	*(15.60)*	*(18.00)*	*(22.80)*
Higher-income nonparticipating children																			
1 year old	≤ 300	79	94	104	120	157	205	240	268	318	*(7.98)*	*(8.40)*	*(9.13)*	*(11.80)*	*(21.40)*	*(21.40)*	*(32.90)*	*(45.10)*	*(64.80)*
2 years old	≤ 300	91	104	113	128	161	203	230	250	283	*(8.79)*	*(9.76)*	*(10.50)*	*(11.50)*	*(14.00)*	*(17.80)*	*(21.60)*	*(25.80)*	*(36.40)*
3 years old	≤ 300	70	81	89	102	131	168	193	212	243	*(11.30)*	*(12.10)*	*(12.30)*	*(12.50)*	*(13.90)*	*(19.40)*	*(25.00)*	*(29.90)*	*(37.40)*
4 years old	≤ 300	94	105	113	126	153	188	211	229	259	*(6.87)*	*(7.10)*	*(7.58)*	*(8.94)*	*(13.90)*	*(23.10)*	*(30.30)*	*(36.20)*	*(46.80)*
Total, age adjusted	–	74	87	97	* 112	* 147	** 193	** 225	** 250	* 292	*(4.40)*	*(4.27)*	*(4.05)*	*(4.23)*	*(6.81)*	*(9.97)*	*(12.50)*	*(14.90)*	*(19.30)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall. The Bonferroni adjustment was used to adjust levels of significant and control for multiplicity in the number of tests.

[1] The Dietary Guidelines recommend that persons of all ages consume less than or equal to 300 milligrams of cholesterol daily.

Source: NHANES 1999–2004 dietary recalls. See notes on prior table.

Appendix C
Other Detailed Tables

List of Tables

Table C-1—Mean Percent of Daily Energy Intakes from Solid Fats and Added Sugars (SoFAAS): Children Age 2-4[1]

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean percent of calories	Standard Error	Sample size	Mean percent of calories	Standard Error	Sample size	Mean percent of calories	Standard Error	Sample size	Mean percent of calories	Standard Error
Children												
2 years old	522	34.8	*(0.64)*	200	33.1	*(1.03)*	146	** 38.3	*(1.07)*	145	33.3	*(0.94)*
3 years old	356	36.1	*(0.75)*	134	37.0	*(1.64)*	110	37.2	*(1.20)*	93	35.2	*(1.24)*
4 years old	334	38.3	*(0.93)*	89	36.3	*(1.59)*	113	39.8	*(1.30)*	113	38.5	*(1.50)*
Total, age adjusted	1,212	36.4	*(0.59)*	423	35.5	*(0.95)*	369	* 38.4	*(0.93)*	351	35.7	*(0.81)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] Calories from solid fats and added sugars (SoFAAS) are identified in the MyPyramid Equivalents Database compiled by USDA/ARS.

Source: NHANES 1999-2002 dietary recalls and MyPyramid Equivalents Database for USDA Survey Food Codes, 1994-2002, Version 1.0, October 2006. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-2—Mean Energy Density of Daily Intakes of Foods by Children Age 1-4[1]

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean energy density	Standard Error	Sample size	Mean energy density	Standard Error	Sample size	Mean energy density	Standard Error	Sample size	Mean energy density	Standard Error
Children												
1 year old	782	1.62	*(0.03)*	373	1.58	*(0.04)*	193	* 1.71	*(0.05)*	191	1.60	*(0.05)*
2 years old	783	1.76	*(0.03)*	306	1.71	*(0.04)*	219	1.78	*(0.05)*	220	1.79	*(0.05)*
3 years old	518	1.82	*(0.04)*	192	1.74	*(0.04)*	171	1.86	*(0.06)*	131	1.86	*(0.07)*
4 years old	499	1.87	*(0.03)*	132	1.84	*(0.06)*	179	1.86	*(0.07)*	167	1.90	*(0.05)*
Total, age adjusted	2,582	1.77	*(0.02)*	1,003	1.72	*(0.03)*	762	* 1.80	*(0.03)*	709	1.79	*(0.03)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] Energy density is measured as calories per 100 grams of solid food. Beverages (fluid milk, juice drinks, soft drinks, coffee, tea, and alcoholic beverages) are not included in the analyses.

Source: NHANES 1999-2004 sample of persons with complete dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-3—Distribution of Body Weights of WIC Children and Nonparticipating Children

	All Children		WIC Children		Income-eligible Nonparticipating Children		Higher-income Nonparticipating Children	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All children, age 2-4 years								
Low BMI	3.8	*(0.75)*	3.5 u	*(1.26)*	† 4.5 u	*(1.50)*	3.5 u	*(1.07)*
Healthy weight	74.9	*(1.62)*	75.6	*(2.66)*	71.3	*(2.54)*	77.3	*(2.58)*
At risk for overweight	11.8	*(1.22)*	12.4	*(1.61)*	10.2	*(2.01)*	12.5	*(2.13)*
Overweight	9.5	*(1.07)*	8.5	*(1.33)*	13.9	*(1.91)*	6.8	*(1.53)*
Sample size	1,643		574		530		466	
Children age 2 years								
Low BMI	4.5 u	*(1.34)*	1.6 u	*(0.67)*	5.0 u	*(2.59)*	5.2 u	*(2.34)*
Healthy weight	77.8	*(1.87)*	80.3	*(2.75)*	74.9	*(4.92)*	78.2	*(2.87)*
At risk for overweight	10.8	*(1.65)*	11.4	*(1.81)*	10.7 u	*(3.55)*	11.4	*(2.93)*
Overweight	6.9	*(1.14)*	6.6	*(1.63)*	9.4	*(2.39)*	5.2 u	*(2.08)*
Sample size	674		269		192		183	
Children age 3 years								
Low BMI	4.5 u	*(1.41)*	2.1 u	*(0.90)*	7.8 u	*(3.73)*	3.8 u	*(2.12)*
Healthy weight	72.6	*(2.62)*	72.9	*(4.27)*	71.5	*(4.33)*	72.8	*(5.06)*
At risk for overweight	13.7	*(2.73)*	15.9	*(3.66)*	8.9 u	*(3.05)*	15.6	*(4.64)*
Overweight	9.2	*(1.63)*	9.1 u	*(2.83)*	11.9	*(2.63)*	7.9 u	*(3.02)*
Sample size	486		179		164		119	
Children age 4 years								
Low BMI	2.3 u	*(0.96)*	6.8 u	*(3.57)*	0.9 u	*(0.33)*	1.5 u	*(0.97)*
Healthy weight	74.3	*(2.81)*	73.6	*(6.99)*	67.8	*(5.14)*	80.8	*(3.66)*
At risk for overweight	10.9	*(1.75)*	10.0 u	*(3.21)*	11.1	*(2.99)*	10.5	*(3.01)*
Overweight	12.4	*(2.04)*	9.6	*(2.05)*	20.2	*(4.42)*	7.2 u	*(2.55)*
Sample size	483		126		174		164	

Notes: Significant differences in distributions are noted by †. Differences are tested in comparison to WIC participants using chi-square tests.
u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

For children, weight categories are defined as: low BMI if BMI-for-age is less than the 5th percentile of the CDC BMI-for-age growth chart; healthy weight if BMI-for-age is between the 5th and 85th percentiles; at risk for overweight if BMI-for-age is between the 85th and 95th percentiles; and overweight if BMI-for-age is above the 95th percentile of the BMI-for-age growth chart.

Source: NHANES 1999-2004 dietary recalls. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-4—Percent of Children Eating All Three Main Meals (Breakfast, Lunch, and Dinner)

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Percent	Standard Error	Sample size	Percent	Standard Error	Sample size	Percent	Standard Error	Sample size	Percent	Standard Error
Children												
1 years old	785	83.0	*(1.75)*	375	77.7	*(2.65)*	193	81.6	*(4.08)*	191	** 89.6	*(2.90)*
2 years old	784	86.6	*(1.73)*	307	74.8	*(3.43)*	219	*** 89.1	*(2.41)*	220	*** 91.6	*(2.73)*
3 years old	518	81.6	*(2.18)*	192	82.5	*(3.25)*	171	77.0	*(3.95)*	131	82.1	*(4.07)*
4 years old	499	85.6	*(1.93)*	132	83.8	*(3.85)*	179	84.8	*(3.23)*	167	86.6	*(3.48)*
Total, age adjusted	2,586	84.2	*(1.03)*	1,006	79.7	*(2.07)*	762	83.1	*(1.68)*	709	** 87.5	*(1.92)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

Source: NHANES 1999-2004 sample of persons with complete dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-5—Percent of Children Eating Each Meal: Breakfast, Lunch, and Dinner

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Percent	Std Error	Sample size	Percent	Std Error	Sample size	Percent	Std Error	Sample size	Percent	Std Error
Percent of Children Eating Breakfast												
Children												
1 years old	785	94.7	*(1.43)*	375	94.7	*(1.41)*	193	94.4	*(2.13)*	191	94.8 u	*(2.50)*
2 years old	784	96.6	*(0.97)*	307	93.8	*(1.84)*	219	97.5 u	*(1.09)*	220	97.3 u	*(1.69)*
3 years old	518	94.6	*(1.31)*	192	97.0 u	*(1.09)*	171	* 90.5	*(2.93)*	131	95.2 u	*(2.80)*
4 years old	499	96.6 u	*(1.09)*	132	97.0 u	*(1.06)*	179	97.1 u	*(1.01)*	167	96.1 u	*(2.19)*
Total, age adjusted	2,586	95.6	*(0.58)*	1,006	95.6	*(0.81)*	762	94.9	*(0.95)*	709	95.8	*(1.14)*
Percent of Children Eating Lunch												
Children												
1 years old	785	90.6	*(1.46)*	375	88.2	*(2.20)*	193	88.4	*(3.63)*	191	* 95.0 u	*(1.69)*
2 years old	784	93.0	*(1.05)*	307	87.6	*(2.77)*	219	* 94.6 u	*(1.56)*	220	* 95.1 u	*(1.72)*
3 years old	518	89.2	*(1.96)*	192	89.4	*(2.89)*	171	86.9	*(3.33)*	131	89.1	*(3.55)*
4 years old	499	91.8	*(1.41)*	132	89.8 u	*(3.16)*	179	93.3 u	*(2.10)*	167	91.4	*(2.70)*
Total, age adjusted	2,586	91.1	*(0.84)*	1,006	88.8	*(1.75)*	762	90.8	*(1.31)*	709	92.6	*(1.56)*
Percent of Children Eating Dinner												
Children												
1 years old	785	94.2	*(0.84)*	375	90.7	*(1.64)*	193	94.6	*(1.09)*	191	*** 97.9 u	*(0.91)*
2 years old	784	95.6	*(0.76)*	307	89.7	*(1.96)*	219	** 96.3	*(1.19)*	220	*** 98.8 u	*(0.56)*
3 years old	518	94.5	*(1.13)*	192	92.6	*(1.72)*	171	95.8	*(1.34)*	131	94.6 u	*(2.36)*
4 years old	499	95.4	*(1.00)*	132	94.0 u	*(2.53)*	179	93.4	*(2.23)*	167	97.1 u	*(1.31)*
Total, age adjusted	2,586	94.9	*(0.54)*	1,006	91.8	*(1.25)*	762	* 95.0	*(0.77)*	709	*** 97.1	*(0.59)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

Source: NHANES 1999-2004 sample of persons with complete dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-6—Average Number of Snacks Consumed

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Std Error	Sample size	Mean	Std Error	Sample size	Mean	Std Error	Sample size	Mean	Std Error
Children												
1 years old	785	3.8	*(0.11)*	375	4.0	*(0.14)*	193	3.9 u	*(0.19)*	191	3.6 u	*(0.18)*
2 years old	784	3.4	*(0.09)*	307	3.2 u	*(0.12)*	219	3.6 u	*(0.19)*	220	3.3 u	*(0.14)*
3 years old	518	2.9 u	*(0.11)*	192	2.8 u	*(0.16)*	171	3.0 u	*(0.16)*	131	3.0 u	*(0.19)*
4 years old	499	2.9 u	*(0.10)*	132	2.6 u	*(0.16)*	179	3.0 u	*(0.21)*	167	3.0 u	*(0.13)*
Total, age adjusted	2,586	3.2	*(0.05)*	1,006	3.2	*(0.08)*	762	3.4	*(0.10)*	709	3.2	*(0.09)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.
u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

Source: NHANES 1999-2004 sample of persons with complete dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-7—Mean Energy Density of Foods Consumed in Meals and Snacks[1]

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard Error	Sample size	Mean	Standard Error	Sample size	Mean	Standard Error	Sample size	Mean	Standard Error
Breakfast												
1 year old	712	1.74	*(0.06)*	333	1.65	*(0.06)*	178	1.84	*(0.12)*	177	1.80	*(0.11)*
2 years old	743	1.79	*(0.05)*	285	1.82	*(0.10)*	208	1.69	*(0.10)*	213	1.85	*(0.11)*
3 years old	481	1.77	*(0.06)*	179	1.61	*(0.09)*	152	1.67	*(0.07)*	126	* 1.93	*(0.10)*
4 years old	463	1.91	*(0.08)*	126	1.95	*(0.11)*	164	1.90	*(0.11)*	153	1.91	*(0.13)*
Total, age adjusted	2,399	1.80	*(0.04)*	923	1.76	*(0.05)*	702	1.77	*(0.05)*	669	1.87	*(0.06)*
Lunch												
1 year old	685	1.77	*(0.06)*	324	1.79	*(0.10)*	167	1.92	*(0.09)*	173	1.69	*(0.09)*
2 years old	694	2.04	*(0.05)*	263	1.93	*(0.09)*	198	2.04	*(0.09)*	199	2.13	*(0.08)*
3 years old	453	2.13	*(0.06)*	165	2.05	*(0.10)*	149	2.22	*(0.11)*	115	2.14	*(0.09)*
4 years old	434	2.23	*(0.07)*	114	2.04	*(0.14)*	160	2.22	*(0.10)*	142	2.29	*(0.11)*
Total, age adjusted	2,266	2.04	*(0.03)*	866	1.95	*(0.07)*	674	2.10	*(0.06)*	629	2.07	*(0.04)*
Dinner												
1 year old	695	1.67	*(0.04)*	320	1.71	*(0.06)*	173	1.69	*(0.07)*	182	1.63	*(0.06)*
2 years old	716	1.82	*(0.03)*	263	1.70	*(0.05)*	205	*** 1.92	*(0.06)*	213	1.83	*(0.05)*
3 years old	468	1.87	*(0.06)*	166	1.97	*(0.11)*	161	1.89	*(0.08)*	119	1.83	*(0.10)*
4 years old	455	1.90	*(0.04)*	122	1.75	*(0.07)*	158	* 2.00	*(0.09)*	156	1.93	*(0.07)*
Total, age adjusted	2,334	1.82	*(0.02)*	871	1.78	*(0.04)*	697	1.88	*(0.04)*	670	1.81	*(0.04)*
Snacks												
1 year old	721	2.50	*(0.08)*	347	2.51	*(0.12)*	173	2.69	*(0.16)*	177	2.33	*(0.15)*
2 years old	734	2.55	*(0.09)*	283	2.66	*(0.14)*	203	2.57	*(0.14)*	211	2.44	*(0.14)*
3 years old	472	2.70	*(0.09)*	169	2.65	*(0.15)*	156	2.73	*(0.14)*	126	2.74	*(0.16)*
4 years old	456	2.65	*(0.10)*	123	2.80	*(0.19)*	157	2.37	*(0.18)*	156	2.75	*(0.18)*
Total, age adjusted	2,383	2.60	*(0.05)*	922	2.66	*(0.09)*	689	2.59	*(0.09)*	670	2.57	*(0.08)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] Energy density is measured as calories per 100 grams of solid food. Beverages (fluid milk, juice drinks, soft drinks, coffee, tea, and alcoholic beverages) are not included in the analyses.

Source: NHANES 1999-2004 sample of persons with complete dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-8—Mean Percent of Energy Intakes from Solid Fats and Added Sugars (SoFAAS), For Meals and Snacks[1]

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean	Standard Error	Sample size	Mean	Standard Error	Sample size	Mean	Standard Error	Sample size	Mean	Standard Error
Breakfast												
Children												
2 years old	498	34.6	*(0.93)*	188	33.6	*(1.84)*	139	37.6	*(2.03)*	141	33.3	*(1.64)*
3 years old	334	35.0	*(0.98)*	128	38.3	*(1.44)*	98	36.6	*(1.19)*	89	* 31.7	*(1.88)*
4 years old	320	35.9	*(1.39)*	87	33.4 u	*(3.75)*	107	39.0	*(2.20)*	107	34.6	*(2.27)*
Total, age adjusted	1,152	35.2	*(0.72)*	403	35.1	*(1.58)*	344	37.7	*(0.90)*	337	33.2	*(1.16)*
Lunch												
Children												
2 years old	469	31.8	*(1.08)*	177	31.3	*(1.96)*	133	34.1	*(1.60)*	130	30.3	*(1.43)*
3 years old	312	34.3	*(1.11)*	113	33.0	*(1.97)*	95	32.7	*(1.83)*	85	35.4	*(1.69)*
4 years old	292	34.4	*(1.55)*	75	33.4	*(2.34)*	102	33.5	*(1.59)*	99	35.6	*(3.16)*
Total, age adjusted	1,073	33.5	*(0.84)*	365	32.6	*(1.41)*	330	33.4	*(1.10)*	314	33.8	*(1.24)*
Dinner												
Children												
2 years old	472	29.8	*(1.01)*	169	26.6	*(1.07)*	136	* 32.1	*(2.02)*	138	30.5	*(1.49)*
3 years old	321	29.0	*(1.18)*	114	32.0	*(2.03)*	103	28.6	*(1.67)*	87	28.3	*(1.87)*
4 years old	307	33.8	*(1.35)*	83	31.0	*(2.74)*	100	35.7	*(2.20)*	106	34.6	*(2.35)*
Total, age adjusted	1,100	30.9	*(0.76)*	366	29.9	*(1.10)*	339	32.2	*(1.43)*	331	31.2	*(1.27)*
Snacks												
Children												
2 years old	504	39.4	*(1.15)*	189	35.6	*(1.78)*	143	** 46.1	*(2.84)*	142	36.1	*(2.25)*
3 years old	331	42.6	*(1.64)*	120	39.1	*(2.25)*	104	* 46.7	*(2.51)*	90	42.6	*(2.57)*
4 years old	312	45.3	*(2.05)*	83	44.7	*(4.00)*	102	47.2	*(4.33)*	108	44.2	*(2.59)*
Total, age adjusted	1,147	42.5	*(1.18)*	392	39.9	*(1.75)*	349	** 46.7	*(2.58)*	340	41.0	*(1.42)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] Calories from solid fats and added sugars (SoFAAS) are identified in the MyPyramid Equivalents Database compiled by USDA/ARS.

Source: NHANES 1999-2002 dietary recalls and MyPyramid Equivalents Database for USDA Survey Food Codes, 1994-2002, Version 1.0, October 2006. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-9—Mean Nutrient Rich (NR) Score for Meals and Snacks: Children Age 1-4[1]

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean NR Score	Standard Error	Sample size	Mean NR Score	Standard Error	Sample size	Mean NR Score	Standard Error	Sample size	Mean NR Score	Standard Error
Breakfast												
1 year old	736	151.4	*(3.47)*	346	150.4	*(4.97)*	184	155.7	*(8.80)*	181	149.4	*(3.67)*
2 years old	752	155.8	*(3.02)*	290	153.0	*(5.35)*	210	161.2	*(5.58)*	215	154.2	*(5.46)*
3 years old	490	151.3	*(4.78)*	182	152.0	*(9.12)*	157	162.7	*(8.31)*	127	145.6	*(6.08)*
4 years old	473	153.3	*(7.01)*	127	142.3	*(8.66)*	167	145.8	*(7.47)*	159	164.2	*(11.88)*
Total, age adjusted	2,451	152.9	*(2.63)*	945	149.4	*(3.68)*	718	156.3	*(4.25)*	682	153.4	*(4.16)*
Lunch												
1 year old	690	98.5	*(2.91)*	326	102.8	*(5.11)*	169	95.1	*(2.63)*	174	97.7	*(3.31)*
2 years old	700	92.3	*(2.10)*	265	94.5	*(1.92)*	200	* 87.9	*(2.59)*	200	93.6	*(3.93)*
3 years old	458	89.7	*(2.44)*	166	90.1	*(3.40)*	153	88.2	*(3.19)*	115	90.2	*(4.53)*
4 years old	437	86.5	*(2.14)*	114	91.7	*(3.83)*	161	* 82.4	*(2.89)*	144	87.4	*(3.23)*
Total, age adjusted	2,285	91.7	*(1.28)*	871	94.8	*(2.12)*	683	** 88.4	*(1.63)*	633	92.2	*(1.95)*
Dinner												
1 year old	701	103.0	*(1.47)*	322	102.8	*(2.69)*	176	99.4	*(2.57)*	183	105.6	*(2.30)*
2 years old	722	100.5	*(1.76)*	267	106.1	*(4.27)*	207	* 97.6	*(2.56)*	213	100.1	*(2.58)*
3 years old	472	98.2	*(2.62)*	169	96.9	*(3.10)*	161	91.5	*(3.47)*	120	102.3	*(5.18)*
4 years old	460	95.2	*(1.84)*	122	98.2	*(4.39)*	159	93.0	*(4.24)*	159	95.0	*(3.07)*
Total, age adjusted	2,355	99.2	*(1.13)*	880	101.0	*(2.22)*	703	* 95.4	*(1.64)*	675	100.7	*(1.80)*
Snacks												
1 year old	771	106.2	*(2.34)*	365	106.4	*(4.27)*	191	98.4	*(3.90)*	189	112.1	*(3.90)*
2 years old	761	89.9	*(2.07)*	293	93.1	*(4.87)*	215	88.5	*(3.53)*	216	89.9	*(2.88)*
3 years old	484	86.2	*(3.97)*	174	82.9	*(4.40)*	161	86.2	*(4.63)*	127	88.4	*(7.97)*
4 years old	473	81.0	*(3.14)*	126	76.4	*(3.77)*	164	80.1	*(3.60)*	162	83.6	*(5.41)*
Total, age adjusted	2,489	90.8	*(1.90)*	958	89.6	*(2.41)*	731	88.2	*(2.38)*	694	93.4	*(3.16)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] The nutrient rich score is based on the Naturally Nutrient Rich (NNR) score proposed by Drenowski (2005), but does not exclude fortified foods.

Source: NHANES 1999-2004 sample of persons with complete dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-10—Mean Nutrient Rich (NR) Score for Daily Intakes: Children Age 1-4[1]

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Sample size	Mean NR Score	Standard Error	Sample size	Mean NR Score	Standard Error	Sample size	Mean NR Score	Standard Error	Sample size	Mean NR Score	Standard Error
Children												
1 year old	785	110.9	*(1.23)*	375	112.1	*(2.09)*	193	** 105.4	*(1.99)*	191	113.1	*(1.47)*
2 years old	784	105.2	*(1.41)*	307	107.1	*(3.08)*	219	101.9	*(2.01)*	220	105.8	*(1.62)*
3 years old	518	99.9	*(1.55)*	192	102.0	*(2.61)*	171	97.9	*(2.20)*	131	100.2	*(2.45)*
4 years old	499	96.8	*(1.50)*	132	98.1	*(2.42)*	179	93.8	*(1.62)*	167	98.3	*(2.92)*
Total, age adjusted	2,586	103.2	*(0.87)*	1,006	104.8	*(1.41)*	762	** 99.7	*(1.25)*	709	104.3	*(1.27)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

[1] The nutrient rich score is based on the Naturally Nutrient Rich (NNR) score proposed by Drenowski (2005), but does not exclude fortified foods.

Source: NHANES 1999-2004 sample of persons with complete dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Table C-11—Food Choices of Children Age 1-4 Years Old

	All Children	WIC Children	Income-eligible Nonparticipating Children	Higher-income Nonparticipating Children
	Percent of children consuming at least once on the intake day			
Sample size	2,586	1,006	762	709
Grains	92.1	91.3	89.1	94.4
Whole grains	32.4	25.0	27.2	***40.9
Not whole grain	89.1	90.5	88.6	88.4
Bread	25.7	27.0	24.2	26.7
Rolls	3.8	3.4	3.2	5.2
English muffin	0.3 u	0.1 u	0.0	0.6 u
Bagels	3.4	2.1 u	1.5 u	5.5
Biscuits, scones, croissants	2.9	1.4	*4.3	2.6
Muffins	1.5	1.1	0.8 u	2.4
Cornbread	1.5	1.6	2.0	0.9 u
Corn tortillas	4.2	8.8	***2.8	***1.7
Flour tortillas	4.2	5.7	6.2	**2.2
Taco shells	1.0	2.2	0.9	**0.3 u
Crackers	27.7	23.8	24.6	*32.1
Breakfast/granola bar	3.5	1.5 u	1.4	**6.0
Pancakes, waffles, French toast	13.0	9.6	8.4	**18.6
Cold cereal	53.4	53.9	52.1	53.7
Hot cereal	10.8	10.2	11.1	10.9
Rice	11.7	14.0	9.6	11.7
Pasta	8.0	6.5	6.1	10.4
Vegetables	64.0	60.3	65.2	66.0
Raw vegetables	16.2	14.3	13.7	19.6
Raw lettuce/greens	1.7	3.5	2.5	*0.2 u
Raw carrots	6.7	1.8	**6.1	***10.6
Raw tomatoes	3.1	3.9	2.6	2.5
Raw cabbage/coleslaw	0.3	0.4	0.7 u	0.1 u
Other raw (high nutrients) [1]	1.2	0.5 u	1.2 u	1.4 u
Other raw (low nutrients) [1]	3.0	2.7	2.0	3.6
Salads (w/greens)	4.6	4.4	3.5	5.6
Cooked vegetables, excluding potatoes	33.9	30.1	*37.2	35.0
Cooked green beans	8.2	7.1	7.9	8.7
Cooked corn	10.1	11.2	13.4	*7.5
Cooked peas	3.8	3.8	3.4	3.9
Cooked carrots	3.0	2.2	2.9	3.8
Cooked broccoli	4.0	3.3	3.6	5.1
Cooked tomatoes	4.0	3.1	4.2	4.8
Cooked mixed	3.8	3.1	5.0	3.5
Cooked starchy	0.2 u	0.0	0.4 u	0.0
Other cooked deep yellow	1.2	1.1 u	0.9	1.7 u
Other cooked dark green	1.3	0.9 u	1.3	1.3 u
Other cooked (high nutrients) [1]	1.7	1.6 u	0.5 u	2.6
Other cooked (low nutrients) [1]	2.4	2.8	1.9	2.6
Other fried	0.4	0.8	0.4 u	*0.0 u
Cooked potatoes	37.3	37.0	41.3	34.4
Cooked potatoes-not fried	13.5	16.0	13.6	10.9
Cooked potatoes-fried	25.9	23.5	29.7	24.7

See footnotes at end of table.

Table C-11—Food Choices of Children Age 1-4 Years Old — Continued

	All Children	WIC Children	Income-eligible Nonparticipating Children	Higher-income Nonparticipating Children
	Percent of children consuming at least once on the intake day			
Vegetable juice	0.3 u	0.3 u	0.2 u	0.0 u
Fruit and 100% fruit juice	79.9	79.9	** 72.0	* 85.6
Any whole fruit	57.3	51.9	* 44.8	*** 68.8
Fresh fruit	49.1	44.6	* 37.1	*** 60.8
Fresh orange	4.9	7.2	5.5	* 3.0
Fresh other citrus	0.3	0.1 u	0.5 u	0.3 u
Fresh apple	16.7	16.4	* 11.9	21.0
Fresh banana	19.1	19.9	16.3	20.9
Fresh melon	3.7	2.5	0.9 u	* 6.1
Fresh watermelon	3.5	2.9	2.0	5.0
Fresh grapes	10.0	7.0	5.8	*** 15.2
Fresh peach/nectarine	1.9	1.5	1.4 u	2.2 u
Fresh pear	1.7	2.2	1.1 u	1.8
Fresh berries	6.1	2.4	2.1	*** 11.5
Other fresh fruit	4.0	3.3	2.1	5.3
Avocado/guacamole	0.6	0.8	0.4 u	0.5 u
Lemon/lime - any form	0.3 u	0.2 u	0.1 u	0.3 u
Canned or frozen fruit, total	14.1	10.9	12.1	** 17.3
Canned or frozen in syrup	9.3	8.6	7.8	10.5
Canned or frozen, no syrup	4.6	1.9	3.3	*** 6.8
Applesauce,canned/frozen apples	6.2	3.2	5.4	** 7.7
Canned/frozen peaches	2.7	2.8	1.2	3.8
Canned/frozen pineapple	1.2	0.9	1.8 u	1.0 u
Other canned/frozen	5.4	5.2	4.4	6.6
100% Fruit juice	59.0	66.0	*** 50.1	60.8
Non-citrus juice	43.7	48.7	*** 34.7	46.4
Citrus juice	22.5	24.2	23.2	21.4
Dried fruit	3.4	2.2	1.5 u	* 5.1
Milk & milk products	91.3	89.1	88.9	* 93.8
Cow's milk, total	86.2	85.2	84.8	87.3
Unflavored white milk, total	81.9	81.6	79.2	83.4
Unflavored whole milk,	49.0	59.2	* 50.2	*** 41.6
Unflavored non-whole, total	35.7	25.3	30.8	*** 44.9
2% milk, unflavored	28.2	21.4	27.4	*** 32.4
1% milk, unflavored	5.1	1.9	2.7	*** 8.9
Skim milk, unflavored	4.0	2.6	2.2 u	6.0
Unflavored, fat not specified	1.1	1.2	0.7 u	1.3
Flavored milk, total	13.4	13.1	13.7	12.8
Flavored, whole milk	6.7	9.1	8.7	** 3.7
Flavored non-whole, total	5.5	2.4	4.2	*** 7.7
2% milk, flavored	2.6	1.3	2.4	* 3.3
1% milk, flavored	1.5	0.5 u	0.7 u	* 2.7

See footnotes at end of table.

Table C-11—Food Choices of Children Age 1-4 Years Old — Continued

	All Children	WIC Children	Income-eligible Nonparticipating Children	Higher-income Nonparticipating Children
	Percent of children consuming at least once on the intake day			
Skim milk, flavored	1.4	0.6 u	1.0 u	1.6 u
Flavored, fat not specified	1.4	1.8	0.8 u	1.6
Soymilk	0.8	0.0 u	0.4 u	* 1.6 u
Dry or evaporated milk	4.2	5.9	3.3	3.6
Yogurt	10.9	6.1	6.9	*** 16.1
Cheese	29.2	27.9	25.6	31.6
Meat and meat alternates	72.9	71.0	76.8	71.0
Beef	9.5	13.3	10.2	*** 6.3
Ground beef	5.1	4.7	6.8	4.6
Pork	3.8	3.2	5.4	3.1
Ham	2.1	3.0	1.4 u	1.9 u
Lamb and misc. meats	0.8	0.9 u	0.9 u	0.6 u
Chicken	30.9	28.5	34.7	30.3
Turkey	1.6	1.4	1.6	1.2 u
Organ meats	0.3 u	0.4 u	0.3 u	0.2 u
Hot dogs	9.0	8.0	9.4	8.9
Cold cuts	6.1	6.6	4.5	7.3
Fish	6.0	4.0	6.2	7.0
Shellfish	1.2	0.7 u	0.9 u	1.7 u
Bacon/sausage	9.4	7.8	10.3	9.5
Eggs	19.0	24.1	21.2	*** 13.8
Beans	5.4	8.3	6.8	** 2.5
Baked/refried beans	5.3	5.5	4.9	5.1
Soy products	0.8 u	0.0	1.7 u	0.7 u
Protein/meal enhancement	0.2 u	0.3 u	0.2 u	0.0
Nuts	1.9	1.0	1.7	2.6
Peanut/almond butter	3.6	2.7	1.9	5.3
Seeds	0.3 u	0.1 u	0.1 u	0.6 u
Mixed dishes	82.2	82.5	83.6	81.4
Tomato sauce & meat (no pasta)	2.6	2.2	2.5	2.7
Chili con carne	1.0	0.8 u	1.9 u	0.7 u
Meat mixtures w/ red meat	5.2	5.5	7.6	3.6
Meat mixtures W/ chicken/turkey	3.6	3.9	4.2	2.9
Meat mixtures W/ fish	1.3	3.0	0.5 u	1.4 u
Hamburgers/cheeseburgers	10.1	12.7	8.7	9.8
Other sandwiches	36.4	34.4	38.4	36.8
Hot dogs	7.0	8.4	7.5	5.3
Luncheon meat	9.7	12.1	12.6	6.7
Beef,pork,ham	0.7	0.5 u	1.1 u	0.6 u
Chicken,turkey	1.5	0.5 u	0.8 u	* 2.6
Cheese (no meat)	4.7	4.0	4.0	5.8
Fish	1.8	1.0	2.1	1.9
Peanut butter	11.4	9.2	10.6	13.3
Breakfast sandwiches	2.1	1.2	3.6	2.0
Pizza (no meat)	4.9	2.9	4.5	** 6.4
Pizza w/ meat	7.6	7.4	8.5	7.4
Mexican entrees	4.6	5.5	4.9	4.1
Macaroni & cheese	12.3	9.9	13.0	* 14.3
Pasta dishes, Italian style	12.2	11.9	12.4	11.9
Rice dishes	6.9	7.1	8.5	6.0

See footnotes at end of table.

Table C-11—Food Choices of Children Age 1-4 Years Old — Continued

	All Children	WIC Children	Income-eligible Nonparticipating Children	Higher-income Nonparticipating Children
	Percent of children consuming at least once on the intake day			
Other grain mixtures	3.4	4.1	4.2	2.8
Meat soup	3.2	4.7	2.9	** 1.6
Bean soup	0.4 u	0.4 u	0.1 u	0.7 u
Grain soups	8.3	12.0	9.8	*** 4.2
Vegetables mixtures (inc soup)	4.8	7.0	3.3	4.4
Beverages, excl. milk and 100% fruit juice	63.4	66.0	72.1	*** 55.2
Coffee	0.6	1.4	0.7 u	* 0.2 u
Tea	8.2	9.8	11.1	6.3
Beer	0.0	0.0	0.0	0.0
Wine	0.1 u	0.5 u	0.0	0.0
Liquor	0.0	0.0	0.0	0.0
Soda, regular	30.2	36.2	37.1	*** 22.4
Soda, sugar-free	3.6	3.5	4.1	3.0
Noncarbonated, sweetened drinks	38.6	33.2	*** 45.3	36.0
Noncarbonated, low-calorie/sugar free drinks	1.3	1.3	0.7 u	1.7 u
Sweets and desserts	80.6	77.3	80.6	* 83.7
Sugar and sugar substitutes	8.0	10.3	6.8	* 6.8
Syrups/sweet toppings	15.4	12.2	11.8	** 19.9
Jelly	4.0	3.7	4.5	3.9
Jello	2.8	2.9	2.6	2.7
Candy	30.8	28.3	27.5	33.9
Ice cream	17.0	15.1	18.3	17.7
Pudding	2.1	2.4	1.6 u	2.3
Ice/popsicles	6.0	5.3	8.3	5.2
Sweet rolls	2.1	4.0	* 1.8	** 1.2
Cake/cupcakes	8.8	7.8	9.4	9.4
Cookies	41.7	38.6	40.3	45.4
Pies/cobblers	1.3	0.4 u	* 1.9	1.6 u
Pastries	3.5	2.3	4.3	3.9
Doughnuts	3.6	4.0	4.3	3.1
Salty snacks	44.4	46.4	45.2	42.0
Corn-based salty snacks	16.1	18.3	18.0	* 13.0
Pretzels/party mix	7.5	7.7	7.2	7.7
Popcorn	8.7	5.3	5.1	* 12.4
Potato chips	18.7	19.6	21.2	16.4
Added Fats and Oils	30.5	27.6	24.3	** 36.8
Butter	8.0	5.6	4.4	** 11.3
Margarine	13.8	13.6	11.5	16.2
Other added fats	0.5 u	0.2 u	0.7 u	0.5 u
Other added oils	0.2 u	0.2 u	0.3 u	0.0
Salad dressing	2.7	0.9	2.0	** 4.6
Mayonnaise	0.8	1.6	0.7 u	0.5 u
Gravy	3.5	4.5	3.6	2.6
Cream cheese	2.0	2.1 u	1.3 u	2.9
Cream /sour cream	2.9	2.8	2.5	3.2

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the interview.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

1 "Other raw" and "Other cooked" vegetables include all vegetables not categorized separately. Within these two groups, vegetables in the top quartile of the distribution of Vitamins A or C per 100 grams were categorized as "high in nutrients"; all others are "in nutrients."
Raw vegetables, high in nutrients include peppers (sweet and hot), broccoli, cauliflower, green peas, seaweed, and snowpeas.
Raw vegetables, low in nutrients include onions, cucumbers, celery, radishes, and mushrooms.
Cooked vegetables, high in nutrients include cabbage, peppers, asparagus, cauliflower, brussel sprouts, snowpeas, and squash.
Cooked vegetables, low in nutrients include artichokes, onions, mushrooms, eggplant, beets, and yellow string beans.

Source: NHANES 1999-2004 dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Tabulations are based on NHANES data containing one record for each individual food reported by respondents. Food choices reflect all individual foods except when foods were reported to be eaten in 'combination' as sandwiches, green salads, and soup. Sandwiches, salads and soups are counted as one food choice.

Table C-12—Food Choices in the Milk and Milk Products Food Group: 1-Year-Olds and 2-4-Year-Olds

	All Children	WIC Children	Income-eligible Nonparticipating Children	Higher-income Nonparticipating Children
	Percent of children consuming at least once on the intake day			
	1-Year-Olds			
Sample size	785	375	193	191
Milk & milk products	94.0	91.8	92.0 u	** 97.4 u
Cow's milk, total	89.6	86.8	88.5	92.5
Unflavored white milk, total	86.7	84.7	83.6	89.9
Unflavored whole milk,	66.6	64.4	65.4	70.1
Unflavored non-whole, total	21.8	22.6	21.1	20.8
2% milk, unflavored	19.2	21.4	20.3	15.6
1% milk, unflavored	1.8 u	0.8 u	1.2 u	3.2 u
Skim milk, unflavored	1.0 u	0.5 u	0.4 u	2.0 u
Unflavored, fat not specified	0.2 u	0.3 u	0.0	0.0
Flavored milk, total	7.8	7.7	10.6	5.9
Flavored, whole milk	4.7	4.5	8.3	2.6 u
Flavored non-whole, total	2.7	3.1 u	1.7 u	2.5 u
2% milk, flavored	1.0 u	1.3 u	1.5 u	0.4 u
1% milk, flavored	0.7 u	0.0	0.2 u	1.0 u
Skim milk, flavored	1.0 u	1.8 u	0.0	1.1 u
Flavored, fat not specified	0.8 u	0.6 u	0.6 u	1.2 u
Soymilk	0.5 u	0.0	0.0	1.4 u
Dry or evaporated milk	3.2	4.9	3.9 u	*** 1.1 u
Yogurt	11.9	6.1	8.1	*** 19.7
Cheese	34.4	31.3	25.2	* 43.1
	2-4-Year-Olds			
Sample size	1,801	631	569	518
Milk & milk products	90.3	88.2	87.9	92.6
Cow's milk, total	85.2	84.7	83.5	85.6
Unflavored white milk, total	80.3	80.6	77.7	81.2
Unflavored whole milk,	43.2	57.5	** 45.2	*** 32.2
Unflavored non-whole, total	40.4	26.2	34.0	*** 52.8
2% milk, unflavored	31.2	21.4	29.7	*** 38.0
1% milk, unflavored	6.2	2.3	3.2	*** 10.8
Skim milk, unflavored	5.0	3.3 u	2.8 u	7.3
Unflavored, fat not specified	1.4	1.5	1.0 u	1.7
Flavored milk, total	15.2	14.9	14.8	15.1
Flavored, whole milk	7.4	10.7	8.9	** 4.1
Flavored non-whole, total	6.4	2.2	5.1	*** 9.4
2% milk, flavored	3.1	1.3 u	2.8 u	** 4.3
1% milk, flavored	1.8	0.7 u	0.9 u	* 3.3
Skim milk, flavored	1.5	0.2 u	1.4 u	1.8 u

See footnotes at end of table.

Table C-12—Food Choices in the Milk and Milk Products Food Group: 1-Year-Olds and 2-4-Year-Olds — Continued

	All Children	WIC Children	Income-eligible Nonparticipating Children	Higher-income Nonparticipating Children
	Percent of children consuming at least once on the intake day			
	2-4-Year-Olds			
Flavored, fat not specified	1.5	2.2 u	0.9 u	1.7
Soymilk	0.8 u	0.0 u	0.5 u	* 1.7 u
Dry or evaporated milk	4.6	6.2	3.1	4.5
Yogurt	10.6	6.1	6.5	*** 14.9
Cheese	27.5	26.8	25.8	27.8

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the interview.
u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

Source: NHANES 1999-2004 dietary recalls. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.

Tabulations are based on NHANES data containing one record for each individual food reported by respondents. Food choices reflect all individual foods except when foods were reported to be eaten in 'combination' as sandwiches, green salads, and soup. Sandwiches, salads and soups are counted as one food choice.

Table C-13—Percent of Food Choices from Foods Suggested for Frequent, Selective, or Occasional Consumption: Children Age 2-4

	All Children			WIC Children			Income-eligible Nonparticipating Children			Higher-income Nonparticipating Children		
	Foods to enjoy frequently	Foods to enjoy selectively	Foods to enjoy occasionally	Foods to enjoy frequently	Foods to enjoy selectively	Foods to enjoy occasionally	Foods to enjoy frequently	Foods to enjoy selectively	Foods to enjoy occasionally	Foods to enjoy frequently	Foods to enjoy selectively	Foods to enjoy occasionally
Daily intake	21.0	24.5	54.5	20.9	24.1	55.0	* 18.0	23.6	58.3	22.5	26.1	* 51.4
By Food Group												
Grains	21.1	33.4	45.5	24.0	39.9	36.1	19.3	33.8	* 46.9	20.3	31.6	** 48.1
Vegetables	26.9	31.4	41.7	22.4	37.8	39.8	25.6	30.5	43.9	30.8	28.4	40.7
Fruit	74.1	24.1	1.8	74.6	23.4	2.1 u	77.1	20.7	2.2 u	72.2	26.6	1.2 u
Milk group	10.8	30.3	58.9	5.5	18.4	76.1	7.0	* 32.1	* 60.9	** 15.9	*** 36.8	*** 47.3
Meat and meat alternates	21.6	28.8	49.5	20.5	24.0	55.4	20.7	29.9	49.4	24.5	* 30.9	** 44.6
Mixed dishes	21.4	24.4	54.2	24.5	29.2	46.2	21.9	25.4	52.7	17.3	22.6	** 60.1
Condiments, Oils, Fats	6.4	40.7	52.9	7.8	37.3	55.0	6.1	41.6	52.4	5.5 u	42.4	52.1
Sweets	0.0	4.6	95.4	0.0	2.9 u	97.1 u	0.0	1.5 u	98.5 u	0.0	* 7.4	* 92.6
Beverages	8.5	0.0	91.5	11.7 u	0.0	88.3 u	6.5	0.0	93.5	10.3	0.0	89.7
Salty snacks	0.0	18.7	81.3	0.0	11.2 u	88.8 u	0.0	7.8 u	92.2 u	0.0	** 30.0	** 70.0

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC benefits at the time of the recall.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

Sources: NHANES 1999-2002 dietary recalls and MyPyramid Equivalents Database for USDA Survey Food Codes, 1994-2002, Version 1.0, October 2006. Excludes pregnant and breastfeeding women and infants. Estimates are based on a single dietary recall per person. 'All Children' includes those with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC and nonparticipants.

Table C-14—Healthy Eating Index-2005 (HEI-2005) Scores for Children Age 2-4 Years Old

	Children age 2-4 years							
	All Children		WIC Children		Income-eligible Nonparticipating Children		Higher-income Nonparticipating Children	
	Mean Score	Standard error	Mean Score	Standard error	Mean Score	Standard error	Mean Score	Standard error
Sample size	1,212	–	423	–	369	–	351	–
Total Fruit	5.0	*(0.19)*	5.0	*(0.31)*	* 4.2	*(0.24)*	5.0	*(0.33)*
Whole Fruit	4.8	*(0.29)*	4.2	*(0.38)*	3.9	*(0.38)*	5.0	*(0.52)*
Total Vegetables	2.3	*(0.06)*	2.3	*(0.11)*	2.5	*(0.17)*	2.1	*(0.13)*
Dark Green & Orange Vegetables, and Legumes	1.0	*(0.10)*	0.9	*(0.18)*	1.2	*(0.23)*	0.9	*(0.17)*
Total Grains	5.0	*(0.10)*	5.0	*(0.16)*	5.0	*(0.19)*	5.0	*(0.11)*
Whole Grains	0.9	*(0.06)*	0.8	*(0.08)*	0.8	*(0.09)*	** 1.1	*(0.09)*
Milk	10.0	*(0.43)*	9.5	*(0.42)*	10.0	*(0.58)*	10.0	*(0.60)*
Meat & Beans	7.2	*(0.21)*	7.8	*(0.33)*	7.6	*(0.36)*	** 6.4	*(0.31)*
Oils	4.6	*(0.20)*	3.9	*(0.24)*	4.5	*(0.27)*	* 4.9	*(0.32)*
Saturated Fat[1]	4.3	*(0.17)*	4.0	*(0.32)*	4.4	*(0.22)*	4.7	*(0.32)*
Sodium[1]	4.8	*(0.27)*	4.6	*(0.39)*	4.7	*(0.45)*	5.1	*(0.35)*
Calories from SoFAAS	8.7	*(0.34)*	9.1	*(0.54)*	* 7.2	*(0.60)*	9.4	*(0.45)*
Total HEI Score	59.8	*(1.10)*	58.3	*(1.46)*	56.0	*(1.71)*	* 63.6	*(1.55)*

	2 years old							
	All Children		WIC Children		Income-eligible Nonparticipating Children		Higher-income Nonparticipating Children	
	Mean Score	Standard error	Mean Score	Standard error	Mean Score	Standard error	Mean Score	Standard error
Sample size	522	–	200	–	146	–	145	–
Total Fruit	5.0	*(0.40)*	5.0	*(0.56)*	4.5	*(0.52)*	5.0	*(0.62)*
Whole Fruit	5.0	*(0.44)*	5.0	*(0.70)*	4.3	*(0.67)*	5.0	*(0.62)*
Total Vegetables	2.1	*(0.09)*	2.3	*(0.17)*	2.2	*(0.21)*	1.8	*(0.16)*
Dark Green & Orange Vegetables, and Legumes	0.9	*(0.14)*	0.8	*(0.14)*	1.0	*(0.19)*	1.0	*(0.29)*
Total Grains	5.0	*(0.13)*	5.0	*(0.14)*	5.0	*(0.25)*	5.0	*(0.23)*
Whole Grains	1.0	*(0.10)*	0.6	*(0.08)*	0.7	*(0.10)*	*** 1.3	*(0.17)*
Milk	10.0	*(0.55)*	10.0	*(0.43)*	10.0	*(1.15)*	10.0	*(0.74)*
Meat & Beans	7.3	*(0.34)*	7.6	*(0.36)*	7.4	*(0.73)*	7.0	*(0.55)*
Oils	4.2	*(0.31)*	3.7	*(0.34)*	4.0	*(0.43)*	4.6	*(0.47)*
Saturated Fat[1]	4.6	*(0.29)*	5.0	*(0.39)*	4.2	*(0.44)*	4.5	*(0.60)*
Sodium[1]	4.7	*(0.39)*	5.2	*(0.38)*	5.2	*(0.70)*	3.8	*(0.69)*
Calories from SoFAAS	9.8	*(0.30)*	10.6	*(0.46)*	*** 7.3	*(0.71)*	11.0	*(0.41)*
Total HEI Score	62.7	*(1.20)*	63.5	*(1.70)*	** 56.6	*(1.80)*	66.6	*(2.04)*

See footnotes at end of table.

Table C-14—Healthy Eating Index-2005 (HEI-2005) Scores for Children Age 2-4 Years Old — Continued

	3 years old							
	All Children		WIC Children		Income-eligible Nonparticipating Children		Higher-income Nonparticipating Children	
	Mean Score	Standard error	Mean Score	Standard error	Mean Score	Standard error	Mean Score	Standard error
Sample size	356	–	134	–	110	–	93	–
Total Fruit	5.0	*(0.34)*	5.0	*(0.75)*	4.5 u	*(0.45)*	5.0 u	*(0.64)*
Whole Fruit	5.0	*(0.54)*	4.5	*(0.81)*	4.4	*(0.73)*	5.0 u	*(1.01)*
Total Vegetables	2.3	*(0.10)*	2.3	*(0.17)*	2.5	*(0.24)*	2.3	*(0.22)*
Dark Green & Orange Vegetables, and Legumes	1.1	*(0.21)*	1.1	*(0.34)*	1.3 u	*(0.52)*	1.0 u	*(0.35)*
Total Grains	5.0	*(0.13)*	5.0	*(0.17)*	5.0	*(0.24)*	5.0	*(0.18)*
Whole Grains	1.0	*(0.11)*	0.7	*(0.14)*	1.1	*(0.21)*	** 1.2 u	*(0.15)*
Milk	10.0	*(0.78)*	10.0	*(0.66)*	10.0	*(0.74)*	10.0	*(1.38)*
Meat & Beans	7.0	*(0.36)*	7.5	*(0.42)*	7.6	*(0.59)*	** 5.7	*(0.49)*
Oils	4.4	*(0.25)*	4.1	*(0.34)*	4.6	*(0.35)*	4.3	*(0.51)*
Saturated Fat[1]	4.3	*(0.41)*	4.0	*(0.47)*	4.3	*(0.63)*	5.1	*(0.55)*
Sodium[1]	4.9	*(0.48)*	4.0	*(0.69)*	4.7	*(0.67)*	5.9	*(1.00)*
Calories from SoFAAS	8.8	*(0.47)*	8.1 u	*(0.99)*	8.1 u	*(0.72)*	9.7 u	*(0.67)*
Total HEI Score	60.7	*(1.94)*	56.7	*(2.83)*	58.4	*(2.41)*	* 65.8	*(2.61)*

	4 years old							
	All Children		WIC Children		Income-eligible Nonparticipating Children		Higher-income Nonparticipating Children	
	Mean Score	Standard error	Mean Score	Standard error	Mean Score	Standard error	Mean Score	Standard error
Sample size	334	–	89	–	113	–	113	–
Total Fruit	4.5	*(0.22)*	4.7 u	*(0.41)*	* 3.5 u	*(0.34)*	5.0 u	*(0.45)*
Whole Fruit	4.0	*(0.35)*	2.9 u	*(0.39)*	2.9	*(0.44)*	* 5.0	*(0.73)*
Total Vegetables	2.4	*(0.10)*	2.4	*(0.19)*	2.7	*(0.27)*	2.3	*(0.28)*
Dark Green & Orange Vegetables, and Legumes	0.8	*(0.11)*	0.7 u	*(0.23)*	1.2	*(0.30)*	0.7	*(0.16)*
Total Grains	5.0	*(0.20)*	5.0	*(0.50)*	5.0	*(0.28)*	5.0	*(0.25)*
Whole Grains	0.8	*(0.06)*	1.1 u	*(0.14)*	** 0.6	*(0.11)*	0.9	*(0.08)*
Milk	9.1	*(0.50)*	8.5	*(0.88)*	9.2	*(0.77)*	9.5	*(0.57)*
Meat & Beans	7.3	*(0.21)*	8.4	*(0.73)*	7.8	*(0.46)*	* 6.4	*(0.41)*
Oils	5.1	*(0.30)*	4.0	*(0.36)*	5.0	*(0.59)*	** 5.7	*(0.41)*
Saturated Fat[1]	4.2	*(0.32)*	3.0 u	*(0.94)*	4.7	*(0.29)*	4.4	*(0.54)*
Sodium[1]	4.9	*(0.44)*	4.6	*(0.71)*	4.1	*(0.79)*	5.6	*(0.65)*
Calories from SoFAAS	7.5	*(0.58)*	8.8 u	*(0.83)*	* 6.3 u	*(0.88)*	7.6 u	*(0.96)*
Total HEI Score	56.0	*(1.27)*	54.9 u	*(1.81)*	53.1	*(2.33)*	58.6	*(2.34)*

Notes: Significant differences in means and proportions are noted by * (.05 level), ** (.01 level), or *** (.001 level). Differences are tested in comparison to WIC participants, identified as children receiving WIC at the time of the interview.

u Denotes individual estimates not meeting the standards of reliability or precision due to inadequate cell size or large coefficient of variation.

– Not applicable.

1 Calculated as the mean of individual HEI scores, rather than the score of group means to enable significance testing (see Appendix A).

Source: NHANES 1999-2004 dietary recalls and MyPyramid Equivalents Database for USDA Survey Food Codes, 1994-2002, Version 1.0, October. 2006. Estimates are based on a single dietary recall per person. 'All Children' includes children with missing WIC participation or income. Percents are age adjusted to account for different age distributions of WIC participants and nonparticipants.