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# What's in Children's Backpacks: Foods Brought from Home

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## Abstract

Forty-one percent of elementary schoolchildren bring lunch to school on any given day. Fortyfive percent bring snacks. Surprisingly, little is known about the foods and beverages they bring. The present cross-sectional analysis of baseline data from the GREEN Project Lunch Box Study sought to: (1) characterize foods and beverages brought from home to school by elementary schoolchildren, and (2) compare the quality of packed lunches to National School Lunch Program (NSLP) standards and packed snacks to Child and Adult Care Food Program (CACFP) requirements. Lunches and snacks from 626 elementary schoolchildren were assessed and evaluated using digital photography and a supplemental food checklist. Food and beverage types most likely to be provided for lunch were sandwiches (59%), snackfoods (42%), fruit (34%), desserts (28%), water (28%) and sugar-sweetened beverages (24%). Twenty-seven percent of



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lunches met at least three of five NSLP standards. At snack, snackfoods (62%), desserts (35%) and sugar-sweetened beverages (35%) were more common than fruits (30%), dairy foods (10%), and vegetables (3%). Only 4% of snacks met two of four CACFP standards. Future research is needed to understand the multiple determinants of food packing behavior, including constraints faced by families. School wellness policies should consider initiatives that work collaboratively with parents to improve the quality of foods brought from home.

### Keywords

children; packed lunches; school nutrition; nutritional quality; food-based standards

## Introduction

Schoolchildren in the United States (U.S.) do not eat recommended amounts of fruits, vegetables, whole grains, and low-fat dairy as defined by the Dietary Guidelines for Americans[1] and consume excessive calories from energy-dense, nutrient-poor foods and beverages.[2,3] Potential consequences of these unhealthy dietary patterns in childhood include diminished academic performance[4], obesity[5], and chronic disease in adulthood.[6]

The obesity epidemic among U.S. schoolchildren[7] has resulted in both federal and state policies to improve school food environments.[8] Substantial improvements to foods provided by the National School Lunch Program (NSLP) have occurred as a direct result of the Healthy, Hunger-Free Kids Act.[9] Forty-one percent of U.S. schoolchildren bring lunch to school on any given day[10] and 45% bring snacks.[11] Few studies have evaluated the quality of packed lunches and to the authors' knowledge, data that describe foods and beverages brought from home exclusively for snacks have not been published. Therefore, the aim of the present study was to characterize the types of lunch and snack foods and beverages brought from home to school by elementary schoolchildren, and to compare the quality of packed lunches to NSLP[12] standards and snacks to Child and Adult Care Food Program (CACFP) requirements.[13]

## METHODS

### Setting and Participants

The analysis utilized baseline data from the GREEN Project Lunch Box Study, a school-based nutrition education and eco-friendly communication campaign designed to influence foods brought from home. Intervention elements included a 22-lesson curriculum, school-based activities, and parent materials. Participants in grades three and four were recruited in Spring 2011 from six Eastern Massachusetts public school districts. School districts were selected so that no more than 30% of students were eligible for free lunches and 10% for reduced price lunches, in order to ensure enrollment of adequate numbers of students who did not participate in NSLP. All schools selected for the study had a classroom snack period for third and fourth graders. Recruitment packets, available in English and Spanish, were sent home from classrooms in children's backpacks. To be eligible to participate in the study, children had to bring some food from home at least three days per week, either for

lunch, snack, or both. Parents and participants provided written informed consent and assent, respectively. The study protocol was approved by the Tufts University Institutional Review Board.

## Measures

**Socio-Demographic Data—**Parent and child demographic data were obtained from a self-administered, 16-item pencil-and-paper survey that was included in the recruitment packet. Participants returned the demographic survey to classroom teachers in sealed envelopes; surveys were later collected from the school by trained research staff. Child race/ethnicity was parent-reported based on the categories of the National Institutes of Health[14] and aggregated into four groups: non-Hispanic white/Caucasian, black/African American, Hispanic, and other/multi-racial. Income was used as an indicator of socioeconomic status (SES).

**Dietary Data Collection—**Baseline dietary data were collected from late October to early December 2011 by trained graduate student research assistants before the start of the intervention. The date of the data collection visit was arranged in advance with teachers; participants and parents were not informed of the date to prevent biases in packing behaviors. Data collection took place in each school cafeteria and was scheduled for the morning, prior to any eating events.[15,16] All packed lunches and snacks of participants in the same class were examined on a single day unless the participant was absent. In cases of absences, data collectors returned to the school on a subsequent, pre-arranged date, again without informing participants or parents. Justification for the collection of one day of dietary data for each participant was supported by a pilot study of 55 participants in three schools conducted during Spring 2011 over five random days. Day-to-day consistency with which participants brought either a snack or lunch and snack was moderate (intraclass correlation coefficient [ICC]=0.51). The median number of food items brought from home was two, ranging from 1 to 8 (ICC=0.66). The day-to-day variability in servings was moderate (ICC=0.59) with some variability by food type.

Digital photography and a supplemental food inventory checklist (FIC) were used as the dietary assessment method. The development of the FIC used in this study was informed by checklists used in previous studies that support their use in school settings as an efficient and accurate alternative to traditional direct observation.[17-19] The protocol did not permit the data collectors to touch participants' foods and beverages. Participants emptied the contents of their lunch boxes or bags on to an 11 by 17 inch placemat that had a unique study ID and a 1-inch square grid background. Participants placed foods and beverages intended to be consumed at snack on the left side of the placemat (labeled "1") and those intended to be consumed at lunch on the right side of the placemat (labeled "2") (Figure 1). Participants were instructed to take lids off of containers, unwrap opaque packaging (aluminum foil, paper towels) and to orient brand names of packaged food forward. Angle (35 degrees) and aerial (20.5 inches) photographs were taken of each participant's placemat. Separate snack and lunch photos were taken when the number of items brought from home exceeded the space available on one placemat.

The photograph was considered the primary source of data. To supplement these data, research assistants recorded detailed information regarding eight major food and beverage categories (beverages, fruits, vegetables, sandwiches, leftovers, snackfoods, desserts, and condiments) on the FIC. Participants were asked whether beverages in reusable containers were 100% juice, if they planned to purchase other beverages (e.g., milk) or eat other foods at school. Data collectors recorded this information on the FIC, along with sandwich fillings. Each participant repacked their lunch and snack after the photographs and checklist were complete.

**Photo Coding—**The first step in the analysis of packed items was to identify foods and beverages in the photographs. The portion sizes of commercially packaged foods and beverages were obtained directly from the packaging and entered by weight. For foods and beverages not in commercial packaging, estimation of portion sizes involved a comparison of the item in the photograph to standard reference photos in a reference manual developed for the study. The manual included 1200 food and beverage photographs, divided into the eight major food and beverage categories corresponding to the FIC. Each page of the manual contained six reference photos of the food or beverage; two photos (one angle and one aerial view) for each small, medium, and large portion size. Angle and aerial photos were taken at the same specifications used for data collection to allow for an exact comparison of the photo data to the standard reference photos. Reference photos of foods were taken in plastic sandwich bags and different container shapes, since foods that were not commercially packaged were packed in this manner. Small, medium, and large portions were based on reference weights (grams) provided by the Nutrition Data System for Research (NDSR, University of Minnesota). For cases in which NDSR did not provide guidelines for portions, one-half of the FDA serving size defined small, the FDA serving size defined medium, and 1.5 times the FDA serving size defined large.

Two independent coders classified portion sizes as small, medium, and large. Discrepancies of one category (e.g. small versus medium, medium versus large) were considered disagreements. Discrepancies of two categories (e.g. small versus large) were assumed to be errors and were re-evaluated by the coders. A certainty rating (i.e. pretty sure, quite sure) was used to expand the three-point scale to a five-point scale (i.e. small, small/medium, medium, medium/large, large). The method met validity and inter-rater reliability criteria, with coders correctly ranking the portion sizes more than 80% of the time.

**Dietary Assessment—**Portion size estimates for all foods and beverages were linked to gram weights corresponding to those represented by each photo in the reference manual. The gram weight for the portion size of each item was divided by the FDA serving size to determine number of servings. Gram weights were anchored by the small, medium, and large portion sizes. The average gram weight between small and medium or medium and large was used for the two estimates between the anchors - small/medium and medium/large.

The characterization of foods and beverages packed for lunches and snacks involved aggregating items within each of the major original groups on the FIC (beverages, sandwiches, leftovers, snackfoods, desserts, fruits, vegetables, and condiments) based on

typology. The final major food and beverage categories and subcategories are defined in Table 1. Condiments were excluded from the analyses.

The quality of lunches was evaluated by comparing the servings of foods and beverages in each packed lunch to NSLP standards.[12] Federal standards align lunches and snacks with the Dietary Guidelines for Americans 2010 and emphasize improvements in the provision of fruits, vegetables, and whole grains. The following five standards were used:

1. 1/2 cup of fruit (excludes fruit juice)
2. 3/4 cup of vegetables (excludes vegetable juice and vegetables "carried" in another item such as lettuce on a sandwich because the contribution to total vegetable portion size was negligible)
3. one ounce of grains from bread, rice, pasta, cereal, and granola (excludes grains from snackfoods and desserts)
4. one ounce meat/meat alternate (from sandwiches with protein filling, nuts/seeds, eggs, peanut/nut butter, hummus, leftover meat, cheese, and yogurt)
5. one cup fluid milk

Participants received "credit" (1 point) for each standard by meeting the minimum quantity indicated. Participants received credit for milk if they had one cup fluid milk on the lunch side of their placemat or if they indicated intent to purchase milk at school. Participants received credit for grains whether the item was whole grain or made from refined grains because the photographic method did not allow us to accurately distinguish between them. It was assumed that all sandwiches with protein fillings contained at least one ounce of protein. These assumptions were conservative relative to our hypothesis. The final lunch evaluation score ranged from zero (met no standards) to five (met five standards).

The quality of snacks was evaluated using four food-based standards (e.g. fruit or vegetable, grains, meat/meat alternate, fluid milk) from CACFP for after-school snacks for this age group.[13] Participants received credit for each standard by meeting the minimum quantity indicated. CACFP criteria combine fruits and vegetables into one standard and include fruit juice. The grain and meat/meat alternate criteria were the same as for lunches. The intention to purchase milk at school was not counted towards the milk minimum in the snack analysis because milk was not available for purchase for snacks. The final snack evaluation score ranged from zero (met no standards) to four (met four standards).

Descriptive statistics were used to summarize the most common food and beverage types and the proportion of lunches and snacks that met federal nutrition standards. Analyses were adjusted for clustering at the school level. All statistical analyses were conducted using Statistical Analysis Software (SAS) version 9.2 (SAS Institute, Cary, NC, USA).

# RESULTS

## Study Participants

A total of 662 third and fourth grade students from 84 classrooms in 12 schools within 6 school districts were enrolled (32% participation rate). Among them, 32 did not bring a lunch or snack on the day of data collection, and four participants brought snacks that contained water only, resulting in a final sample size of 626 participants. The mean (standard deviation) age of the study participants for the analyses was 9.1 (0.6) years, 58% were female, 73% were non-Hispanic white, and 82% of mothers completed post-secondary education (Table 2).

## Lunch and Snack Contents

Forty-eight percent of participants (n=301) brought a lunch from home. Among the lunches, 291 (97%) were brought by participants with a snack and 10 (3%) were brought without a snack. The median number of items brought for lunch was three (range 1-7), consisting of two foods (range 1-6) and one beverage (range 1-3). The typical lunch consisted of water, a sandwich, and a snackfood (Figure 1). The most common lunch foods provided were sandwiches (59%), snackfoods (42%), fruit (34%), and dessert (28%). Less common lunch foods included leftovers (17%), dairy foods (17%), and vegetables (11%). Seventy-three percent of lunches contained a beverage. The most common lunch beverage was water (28%) followed by sugar-sweetened beverages (SSB) (24%) (Table 3). Three percent of lunches included milk, and another 11% of participants planned to buy milk at school. The frequency distribution for lunches meeting NSLP standards is shown in Table 4A. Overall, 27% of lunches met at least three of five NSLP standards. The margin of error in the lunch estimates did not exceed 9.3%, 19 times out of 20.

Of the 616 snacks analyzed, 325 were from participants who brought a snack only and planned to buy their lunch at school. The other 291 snacks were from participants who also brought lunch (included in the lunch analyses). Overall, the median number of items brought for snack was two (range 1-7), consisting of one food (range 1-6) and one beverage (range 1-3). The typical snack consisted of a SSB, with a snackfood or a dessert (Figure 1). Snackfoods (62%), desserts (35%) and SSB (35%) were more common than fruits (30%), dairy foods (10%), and vegetables (3%) at snack (Table 3). The frequency distribution for snacks meeting CACFP standards is shown in Table 4B. Overall, 4.2% of snacks met at least 2 of 4 CACFP standards (Table 4B). Among the 291 participants who brought a lunch and snack, 78 (27%) met three of five NSLP standards. Only three of these 78 participants (4%) brought a snack that met 2 of 4 CACFP standards. The margin of error in the snack estimates did not exceed 8.1%, 19 times out of 20.

# DISCUSSION

To the authors' knowledge, the present study is one of the few to examine the contents of packed lunches among U.S. schoolchildren from a food-based perspective and is the first to characterize packed snacks intended to be consumed in the classroom during the school day. The use of 2012 federal benchmarks allowed a direct comparison of packed lunches and

snacks to the requirements that schools are expected to follow for reimbursement purposes.[12,13] The comparisons were enabled by the novel use of digital photography and the supplemental FIC as dietary assessment methods. In the past ten years, digital photography has emerged as a highly accurate, reliable, and cost-effective tool to measure actual consumption of school cafeteria meals.[19,20] The present study extends digital photography methodology beyond closed eating environments with limited menu offerings (i.e. cafeterias, restaurants) to free-living environments.

The findings relative to packed lunch quality are consistent with previous studies in the U.S. and worldwide. NSLP lunches provide a greater variety of dairy, fruits, and vegetables compared to lunches from home.[21] Elementary students who bring a lunch from home consume fewer total fruits and vegetables[22] and less fiber,[23] but more total calories[24] and are more likely to consume SSB and snacks high in added sugar and fats[25] while at school compared to NSLP participants.[24] NSLP participants are more likely to consume milk, fruit, and vegetables during lunch than nonparticipants.[26] Foods brought from home by schoolchildren in Canada[27] and the United Kingdom[28] were found to have lower nutrition quality compared to foods provided by schools. Fewer than 1% of packed lunches met all the food-based standards for school meals in England.[29] A cross-sectional survey of Australian schoolchildren found that over 90% of packed lunches contained at least one energy-dense, nutrient-poor snack.[30] These studies highlight the global pervasiveness of energy-dense, nutrient-poor packaged foods and beverages.

Lunches and snacks in this study lacked many of the fundamental elements of a healthy diet for school-aged children. Twenty-four percent of lunches did not contain a primary entrée (sandwich or leftover) and the majority of those lunches did not include an alternative source of protein, as would be provided by foods such as yogurt, cheese, peanut butter, or beans. Although the focus of the present study was on foods rather than nutrients, the scarcity of dairy foods and milk raises concerns about the adequacy of dietary calcium. SSB were found in 24% of lunches and 35% of snacks and were primarily portion-packed juice drinks in packages attractive to children. Results suggest a need to focus on reducing consumption of these beverages and promotion of water and low-fat milk as healthier beverage options during the school day.

The present study has a number of limitations. First, participants were not asked who had the primary responsibility to pack their lunch or snack. During data collection, participants were instructed to place foods intended to be consumed at snack on a different side of the placemat from items intended to be consumed at lunch. It should be acknowledged that the participant’s response to this question when they were not the person packing the lunch may not reflect the packer’s intent. It is possible that some foods and beverages may have been assigned to the incorrect eating occasion by the 291 participants who brought both lunch and snack. In addition, participants reported details about juice packed in reusable bottles, and self-reported plans to purchase milk and eat other foods at school. These factors could have introduced error in the number of food-based standards met for lunch and snack.

Second, actual food consumption was not measured. It is possible that more foods and beverages were packed for participants than they consumed and that part of what was

packed was thrown out, shared, or returned home at the end of day. The quality of what is packed suggests that there is considerable room for improvement, regardless of how much the participant actually consumes. Furthermore, it is unlikely that the more healthy foods are consumed in favor of the less healthy ones.

Finally, the generalizability of the results needs to be considered. The use of a convenience sample from school districts in which no more than 30% of participants were eligible for free lunches and 10% for reduced price lunches resulted in a study sample with a relatively high maternal education level and SES. It is also possible that parents with an interest in the intervention were differentially attracted to the study and may not be representative of the school districts studied. However, the findings that few of the lunches and snacks brought from home met NSLP or CACFP standards are particularly noteworthy given that the sample comprised families that volunteered for a nutrition education study; presumably these families would be more motivated than other families to provide their children with nutritious lunches and snacks.

## CONCLUSION

Schoolchildren who do not participate in the NSLP on a regular basis may not fully benefit from the policy changes enacted for this program, and classroom snacking offers yet another opportunity to consume energy-dense, nutrient poor snacks and SSBs during the school day. Interventions are needed to improve the quality of foods brought from home to school. Understanding the multiple determinants of parental food packing behavior including child preferences and constraints faced by families is a critical next research step. Future research should also examine the extent to which children are responsible for packing their own lunches and snacks for the school day and effective approaches to modify children's choices of what to pack and eat. School wellness policies provide opportunities to work collaboratively with parents to improve the quality of foods brought from home to eat at school, but programs to implement these policies are needed. Finally, both rural and urban school districts, as well as a more diverse population of schoolchildren, need to be included in future studies.

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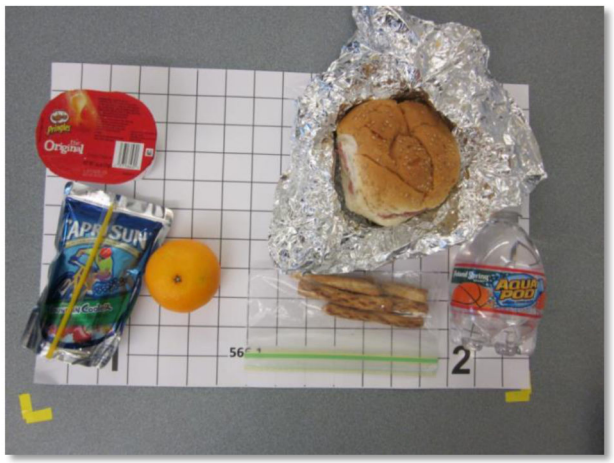


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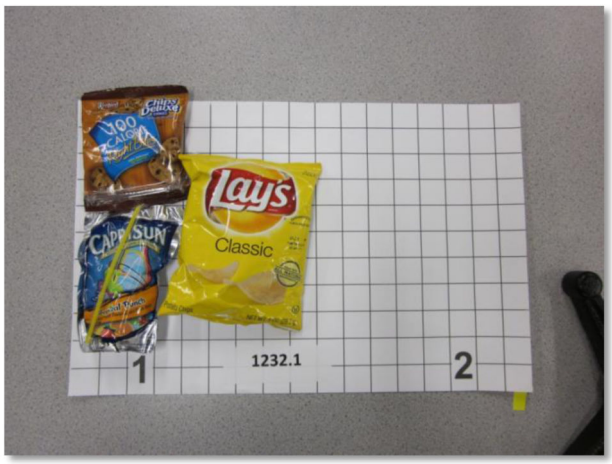
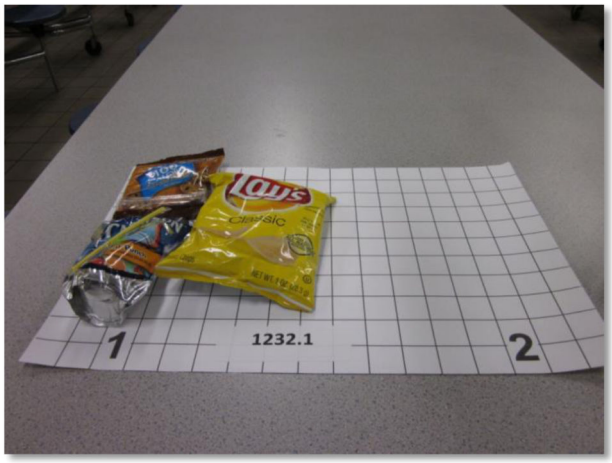



2A


1B




2B

**Figure 1. Typical lunches and snacks brought from home to school by 626 participants at baseline in the GREEN Project Lunch Box Study**

Aerial view (1A) and angle view (1B) of typical lunch and snack contents. Lunch contents (labeled “2): water, sandwich, and snackfood. Snack contents (labeled “1”): Sugar-sweetened beverage, snackfood, and fruit.

Aerial view (2A) and angle view (2B) of typical snack contents: Sugar-sweetened beverage, dessert, and snackfood.

## Table 1

**Categories of foods and beverages brought from home to school at baseline by 626 participants in the GREEN Project Lunch Box Study**

| Food and Beverage Category | Description |
|---|---|
| **Beverages** | |
| **Water** | Bottled or brought in a reusable container only; excludes sparkling water, flavor enhanced water, or water with added vitamins or electrolytes |
| **Juice** | 100% fruit or vegetable juice |
| **Milk-based** | Range of non-fat to whole milk, plain and flavored, and yogurt-based drinks |
| **Sugar-sweetened** | Fruit punch, fruit cocktail, sweetened iced tea, sports drinks, lemonade |
| **Calorie-free** | Diet drinks with artificial sweeteners, water with enhancements |
| **Sandwiches** | |
| **Protein filling** | Sandwich filling from proteins including meat, poultry, cheese, eggs, fish, nut butters |
| **Carbohydrate or fat-based filling** | Sandwich filling from carbohydrate or fats (jam, jelly, chocolate spread, cream cheese) with no protein filling present |
| **Leftovers** | |
| **Pizza** | Pizza and calzones; pizza-based hot-pockets |
| **Grains** | Pasta, rice, couscous, macaroni and cheese (may have added vegetables) |
| **Meat/protein** | Leftover meat that was not part of a sandwich; includes separately packed eggs and beans |
| **Mixed dish** | Soup, stew, chili (may have added vegetables); ethnic dishes (burritos, tacos) |
| **Snackfoods** | |
| **Salty snacks** | Puffed snacks, snack/party mix, popcorn, pretzels |
| **Chips** | Potato chips, corn chips, tortilla chips |
| **Crackers** | Crackers (plain & flavored), sandwich crackers |
| **Nuts/seeds** | Nuts, seeds, trail mix |
| **Desserts** | |
| **Cookies** | All cookie varieties |
| **Baked goods** | Cakes, muffins, dessert-style bread, doughnuts, pastries, pie |
| **Candy** | Chocolate candy, non-chocolate candy, gummy fruit, fruit leather |
| **Other desserts** | Pudding, gelatin, marshmallows, sugar-coated pretzels, dessert-style popcorn |
| **Fruits** | |
| **Fresh** | Includes apples, bananas, grapes, citrus fruits, melon, peaches, berries |
| **Canned** | Applesauce, other pureed fruits, canned fruits (all juice and syrup pack) |
| **Dried** | All dried fruits, 100% fruit leathers; excludes yogurt or chocolate covered dried fruit |
| **Vegetables** | |
| **Green/orange/red** | Includes carrots, tomatoes, red peppers, spinach |
| **Starchy/other vegetables** | Includes potatoes, corn, peas, cucumbers, celery |
| **Dairy foods** | |
| **Yogurt** | Yogurt (plain & flavored); yogurt with topping |
| **Cheese** | String cheese, cheese slices and cubes |

## Table 2

**Baseline characteristics of 626 participants in the GREEN Project Lunch Box Study**

| | | |
|---|---|---|
| **Mean (sd) age, years** | 9.1 (0.6) | |
| | **n** | **%** |
| **Grade** | | |
| 3rd grade | 333 | 53% |
| 4th grade | 293 | 47% |
| **Sex** | | |
| Male | 262 | 42% |
| Female | 364 | 58% |
| **Race/Ethnicity** [a] | | |
| Non-Hispanic white | 453 | 73% |
| Hispanic | 90 | 14% |
| Black/African American | 21 | 3% |
| Multiracial/Other | 48 | 8% |
| **Income** [a] | | |
| ≤ $30,000 | 116 | 19% |
| $30,001-$50,000 | 88 | 14% |
| $50,001-$70,000 | 85 | 13% |
| >$70,000 | 258 | 41% |
| **Maternal Education** [a] | | |
| Less than high school education | 19 | 3% |
| High school graduate or equivalent | 74 | 12% |
| 2-year college degree | 208 | 33% |
| 4-year college degree | 163 | 26% |
| Advanced degree | 144 | 23% |

[a] sample sizes vary slightly due to missing data

## Table 3

**Proportion of lunches and snacks from 626 participants in the GREEN Project Lunch Box Study containing one or more items from food and beverage categories at baseline**

| | Lunches n=301 | | Snacks n=616 | |
|---|---|---|---|---|
| **Food and Beverage Categories** | **n** | **%** | **n** | **%** |
| **Beverages** | **219** | **73%** | **391** | **63%** |
| Water | 84 | 28% | 133 | 21% |
| Sugar-Sweetened Beverage | 72 | 24% | 214 | 35% |
| Milk | 42 | 14% | 12 | 2% |
| Juice | 21 | 7% | 55 | 9% |
| Calorie-free | 3 | 1% | 2 | <1% |
| **Sandwiches** | **178** | **59%** | **3** | **1%** |
| Sandwiches with protein filling | 156 | 52% | 1 | <1% |
| Sandwiches with fat or carbohydrate-based filling | 22 | 7% | 2 | <1% |
| **Snackfoods** | **127** | **42%** | **384** | **62%** |
| Salty snacks | 59 | 20% | 166 | 27% |
| Chips | 39 | 13% | 110 | 18% |
| Crackers | 34 | 11% | 144 | 23% |
| Nuts/seeds | 8 | 3% | 2 | <1% |
| **Fruits** | **104** | **34%** | **188** | **30%** |
| Fresh | 86 | 29% | 157 | 25% |
| Canned | 20 | 7% | 30 | 5% |
| Dried | 4 | 1% | 6 | 1% |
| **Desserts** | **85** | **28%** | **214** | **35%** |
| Cookies | 38 | 13% | 106 | 17% |
| Candy | 30 | 10% | 69 | 11% |
| Baked goods | 14 | 5% | 45 | 7% |
| Other desserts | 7 | 2% | 14 | 2% |
| **Leftovers** | **51** | **17%** | **3** | **1%** |
| Grains | 18 | 6% | 1 | <1% |
| Meat/protein | 12 | 4% | 1 | <1% |
| Mixed dish | 11 | 4% | 0 | 0% |
| Pizza | 10 | 3% | 1 | <1% |
| **Dairy Foods** | **50** | **17%** | **62** | **10%** |
| Yogurt | 40 | 13% | 44 | 7% |
| Cheese | 14 | 5% | 18 | 3% |
| **Vegetables** | **33** | **11%** | **18** | **3%** |
| Green/orange/red | 24 | 8% | 13 | 2% |
| Starchy/other | 10 | 3% | 5 | 1% |

## Table 4

**Percentage of lunches (A) and snacks (B) brought from home to school by 626 participants at baseline in the GREEN Project Lunch Box Study meeting federal nutrition standards**

| **(A) Lunches (n=301)** | | |
|---|---|---|
| | **n** | **%** |
| **Standards** [a] | | |
| Fruit (1/2 cup) | 95 | 32% |
| Vegetables (3/4 cup) | 17 | 6% |
| Grains (1 ounce) | 197 | 65% |
| Protein (1 ounce) | 198 | 66% |
| Milk (1 cup) [b] | 44 | 15% |
| **Lunch Evaluation** | | |
| Number of standards met | | |
| 0 | 44 | 14% |
| 1 | 59 | 20% |
| 2 | 116 | 38% |
| 3 | 68 | 23% |
| 4 | 14 | 5% |
| 5 | 0 | 0% |
| **Met 3 or more standards** | **82** | **27%** |

| **(B) Snacks (n=616)** | | |
|---|---|---|
| | **n** | **%** |
| **Standards** [a] | | |
| Fruit/veg/juice (1/2 cup) | 168 | 27% |
| Grains (1 ounce) | 5 | 1% |
| Protein (1 ounce) | 65 | 10% |
| Milk (1 cup) | 5 | 1% |
| **Snack Evaluation** | | |
| Number of standards met | | |
| 0 | 352 | 57% |
| 1 | 239 | 39% |
| 2 | 25 | 4% |
| 3 | 0 | 0% |
| 4 | 0 | 0% |
| **Met 2 or more standards** | **25** | **4%** |

[a] recommended serving size provided in parentheses

[b] includes participants who indicated they planned to purchase milk at lunch