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## Participant Characteristics and Dietary Correlates of SNAP and Other Assistance Programs Among Families with Children from Racially and Ethnically Diverse Households

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### Abstract

The objective of this study was to describe food purchasing behaviors and the home food environment across families simultaneously receiving SNAP (Supplemental Nutrition Assistance Program) and other cash and food assistance benefits, and assess how child dietary intake varied across three distinct categories of assistance (i.e., SNAP and other assistance programs, assistance programs other than SNAP, and not enrolled in any assistance program). This cross-sectional study was conducted with parents of children aged 5-9 years ( $N = 1,033$ ) from low-income and racially and ethnically diverse households, living in Minneapolis and Saint Paul, Minnesota, metropolitan areas. In an online survey, parents reported enrollment in seven assistance programs (SNAP,

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#### Author Contributions

JNdB study conception and design, conducted data analysis, interpreted the data, wrote the manuscript, and coordinated revisions to the manuscript. KAL contributed to the development of study conception and design, interpretation of the data, and critically revised the manuscript. AF and AT contributed to data analysis, interpretation of the data, and revised the manuscript. ACT coordinated data collection, contributed to interpretation of the data, and revised the manuscript. JMB is the principal investigator of the Family Matters Phase II study, acted as a guarantor of the integrity of the entire Family Matters study, led the development of the Family Matters study concept and design, assisted with data acquisition, contributed to interpretation of the data, and critically revised the manuscript. All authors approved the final version of the manuscript for submission.

#### Conflicts of Interest

The authors have no conflicts of interest to disclose.

#### Ethical Statement

This study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving research study participants were approved by the Institutional Review Board of the University of Minnesota. Electronic informed consent was obtained from all participants.

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WIC [Special Supplemental Nutrition Program for Women, Infants and Children Program], free or reduced-cost school breakfast, free or reduced-cost school lunch, SSI [Supplemental Security Income Program], MFIP [Minnesota Family Investment Program], daycare assistance), food purchasing behaviors, the home food environment, and child dietary and fast-food intake. Descriptive statistics were computed to describe food purchasing behaviors and the home food environment. Multivariable linear regressions were used to evaluate the association between assistance categories and child dietary intake factors. Models were adjusted for child age, parent and child sex, race and ethnicity, household income, primary caregiver's educational attainment, employment status, and place of birth. Relative to families participating in assistance programs other than SNAP and not enrolled in any assistance program, families participating in SNAP and other assistance programs had less reliable modes of transportation to go food shopping (use 'my own car or vehicle' 57% vs. 90% and 83%, respectively), shopped less frequently during the month ('1 big trip a month and small trips in between' 35% vs. 19% and 24%, respectively), had a somewhat higher presence of energy-dense (e.g., 'French fries' 60% vs. 35% and 25%, respectively) and high-sodium food items in the home (e.g., 'canned pasta' meals 48% vs. 35% and 20%, respectively), and some aspects of children's dietary intake that were not congruent with current dietary recommendations (e.g., consumption of 'fried vegetables' 3.9 times/week [95% CI 3.4, 4.4] vs. 2.9 [2.3, 3.5] and 2.8 [2.1, 3.6], respectively). Findings could inform targeted strategies to maximize the impact of simultaneous programs' benefits on improving child dietary intake and reaching of eligible households not enrolled in assistance programs.

## Keywords

food assistance; food insecurity; diet; child; family

## 1. Introduction

Children living in poverty are at increased risk for poor developmental and nutrition-related outcomes (e.g., inadequate dietary intake) (Black et al., 2017). With growing income and racial and ethnic inequality in the United States, social safety net programs have become even more valuable for addressing nutrition-related outcomes for children and supporting families from low-income and racially and ethnically diverse households (Elise Gould, 2019; Meyer & Sullivan, 2009). Both food assistance programs (e.g., Supplemental Nutrition Assistance Program [SNAP]) and programs designed to provide cash and food benefits (e.g., Minnesota Family Investment Program [MFIP], a Minnesota's Temporary Assistance for Needy Families [TANF] program) (henceforth referred to as "assistance programs") play a vital role in addressing the nutritional needs of children and increasing food security in families from low-income households (Newman et al., 2011).

The primary goal of SNAP and other assistance programs is to reduce food insecurity - a condition defined as limited or uncertain access to adequate food that is mostly driven by a lack of money and other resources to purchase adequate foods for a healthy diet (United States Department of Agriculture, 2019). Food insecurity disproportionately impacts children from low-income and racially and ethnically diverse households (United States Department of Agriculture, 2019; Walker et al., 2020). Because of socioeconomic

constraints, children living in these households are vulnerable to have suboptimal dietary intake and suffer from undesirable nutrition-related outcomes, including, but not limited to, overweight/obesity and related diseases during childhood (Hernandez et al., 2017; Larson & Story, 2011; Moradi et al., 2019; Parker et al., 2010). The coexistence of food insecurity and obesity in the same population seems paradoxical. While there are several determinants of childhood overweight and obesity, including genetic predisposition and behavioral, socioeconomic, and environmental determinants, one of the potential mechanisms proposed to explain the complex association between food insecurity and obesity is that families facing hardships might be more likely to buy and keep at home foods that are affordable and energy-dense (i.e., with low amounts of key dietary nutrients) (e.g., chips) (Darmon et al., 2003; Dhurandhar, 2016). The inverse relationship between the selection and consumption of energy-dense and low-cost foods has been described as a strategy to save money to maintain caloric intake at a lower cost (Basiotis & Lino, 2003).

Family food purchasing behaviors and the home food environment are important determinants of child-eating behaviors (Pearson et al., 2008). The availability of both healthful food items (e.g., fruits and vegetables) and energy-dense foods (e.g., cakes, cookies) and beverages (e.g., sugar-sweetened beverages) at home have been shown to have a positive correlation with children's increased intakes of these foods items and to impact (positively or negatively) overall diet quality (Liu et al., 2017; Zahid et al., 2017). Observational studies have noted that these associations are similar among children in low-income households receiving assistance (Liu et al., 2017; Nackers & Appelhans, 2013; Odoms-Young et al., 2014). Additionally, findings from cross-sectional studies have shown important differences in child dietary intake patterns across different racial and ethnic groups (Larson et al., 2015) and household income levels (Kirkpatrick et al., 2012), with such differences also occurring in households receiving cash or food assistance (Arcan et al., 2014; Trofholz, Tate, Fulkerson, et al., 2019). However, these studies did not detail which assistance programs these households were enrolled in.

Because most families with children experiencing food insecurity are eligible for several safety net programs, evidence shows that families from low-income and racially and ethnically diverse households are often enrolled in multiple assistance programs (Coleman-Jensen et al., 2020). However, studies investigating the effects of SNAP on the dietary intake of children and their families often do not account for enrollment in other types of assistance programs. Notably, a systematic review of dietary patterns and food choices among SNAP participants noted mixed evidence about the relationship between children from low-income households receiving SNAP benefits and Healthy Eating Index (HEI), caloric intake, fruit and vegetable consumption, and macronutrient intake (Andreyeva et al., 2015). The authors of this review acknowledged that these mixed findings likely reflected families' simultaneous enrollment in SNAP and other assistance programs, such as the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) and school lunch programs (Andreyeva et al., 2015). Such concurrent enrollment is expected to impact what households buy and keep in their homes and consequently the child's dietary intake as different rules are in place regarding what families can buy with the benefits they receive. For example, SNAP recipients receive funds that can be used to purchase almost any food item their family needs (with few exceptions), whereas WIC recipients receive monthly benefits they can use

to purchase specific foods from a list of foods eligible for purchase. Because studies often fail to account for participation in multiple assistance programs, it is unclear whether child dietary intake is associated with any single assistance program.

To address this gap, the present study described the family food purchasing behaviors and home food environment among low-income, racially and ethnically diverse, and immigrant/refugee households by their participation in SNAP, the largest Federal food and nutrition assistance program (U.S. Department of Agriculture and U.S. Department of Health and Human Services & Office of Policy Support, 2019), and six other assistance programs (i.e., WIC, free or reduced-cost school breakfast, free or reduced-cost school lunch, Supplemental Security Income [SSI], Minnesota Family Investment Program [MFIP], and daycare assistance). We also explored the associations of participation in SNAP and the six other assistance programs with aspects of child dietary intake. Participation in SNAP and the six other programs was compared to households enrolled in assistance programs but not SNAP, and those not enrolled in any assistance program despite likely being eligible for assistance.

## 2. Methods

### 2.1. Study design

The *Family Matters* study is an incremental, mixed-methods investigation of risk and protective factors for childhood obesity in the home environment of racially and ethnically diverse children from primarily low-income households (Berge, Trofholz, et al., 2017). The *Family Matters* study has two phases: (1) Phase I, a *cross-sectional*, mixed-methods, in-home investigation of low-income and racially and ethnically diverse children (aged 5-7 years) and families (N=150), and (2) Phase II, a *longitudinal* cohort study of racially and ethnically and socioeconomically diverse children (aged 5-9 years) and families (N=1307). A detailed description of the study design and methodology of the Family Matters study (Berge, Trofholz, et al., 2017) has been previously published. Data presented in this investigation are from the Family Matters Phase II baseline data only. The Family Matters Phase II study includes data collection at two time points, collected 18-months apart (i.e., baseline and 18-month follow-up). Baseline data collection started in November 2016 and it was completed in November 2019. Data collection included extraction of child weight and height via electronic medical records (EMR) at baseline and follow-up, and administration of a comprehensive online survey guided by the Family Systems Theory (Combrinck-Graham, 1990), which acknowledges multiple levels of influence within the home environment on a child's weight and weight-related behaviors. The development of the Phase II online survey relied on data from Phase I, and respective findings can be found elsewhere (Berge et al., 2019; Berge, Fertig, et al., 2018; Berge, Tate, et al., 2017; Berge, Tate, Trofholz, Fertig, et al., 2018; Berge, Tate, Trofholz, Loth, et al., 2018; de Brito et al., 2020; Fertig et al., 2019; Trofholz, Tate, Loth, et al., 2019). This online survey and other study-related materials (e.g., consent forms) were translated from English to Hmong, Somali, and Spanish by trained bilingual and bi-cultural staff members. Surveys were delivered in the parents' preferred language (i.e., English, Spanish, Somali, or Hmong). The survey was designed to take 45-60 minutes and participants were allowed to stop,

save, and resume the survey later if they preferred. This study was conducted according to the guidelines stated in the Declaration of Helsinki, and all procedures involving research study participants were approved by the Institutional Review Board of the University of Minnesota. Electronic informed consent was obtained from all participants.

## 2.2. Participants

For the Family Matters Phase II study, 1307 parent-child dyads were recruited from primary care clinics located in Minneapolis and St. Paul, Minnesota. Clinics staff identified children between 5 and 9 years old who recently went in for a well-child visit and had recorded height and weight measurements in their EMR. Children between 5 to 9 years old were intentionally recruited for the Phase 2 of the Family Matters study because developmentally they are becoming more responsible for decision-making about their eating and health-related behaviors rather than their parents being the main source of these decisions (Hetherington & Parke, 1999). A total of 8405 study recruitment letters were sent from the primary care clinics to the parents/guardians (henceforth parent) of children identified by the clinic staff (response rate: 16% [1307/8405] eligible and consented). A follow-up phone call by a research team member was made approximately two weeks after recruitment letters were sent to confirm receipt of the recruitment letter, review study eligibility criteria and parents' interest in participating in the study, and answer any questions parents had. Parents and children were eligible for this prospective cohort study if they met the following eligibility criteria: (1) child aged 5-9 years old; (2) child was not diagnosed with any serious medical condition that would influence eating or physical activity behaviors (e.g., severe mental illness affecting dietary intake or engagement in physical activity), (3) child had a BMI percentile 5<sup>th</sup> as identified by the child's EMR and not more than three months old; (4) child was from one of the following racial and ethnic backgrounds: African American, Hispanic, Hmong, Native American, Somali, or White; (5) the parent completing the survey was the primary guardian of the target child; (6) the child lived with the parent more than 50 percent of the time.

## 2.3. Subsample identification

Among the 1307 participants of the Family Matters Phase II study, 1033 participants from low-income households were included in the analytic sample. A total of 274 participants were excluded because they either exceeded 200 percent of the 2017 US Federal poverty guidelines (FPG) (Koball & Jiang, 2018; Roberts et al., 2013) based on their family income and household composition (n=263) or did not provide household income information at enrollment (n=11). We applied these subsample identification criteria post data collection to include only families who were potentially eligible for assistance programs.

## 2.4. Measures

**2.4.1. Assistance programs**—An affirmative response to the following question determined participation in cash and food assistance programs *Does your family receive any of the following? Check all that apply: (1) Food support/stamps (SNAP [Supplemental Nutrition Assistance Program]), (2) WIC (Women, Infants and Children Program), (3) Free or reduced-cost school breakfast, (4) Free or reduced-cost school lunch, (5) SSI*

(Supplemental Security Income), (6) MFIP (Minnesota Family Investment Program), (7) daycare assistance, (8) None. SNAP, WIC, school breakfast and lunch, and daycare assistance programs provide supplemental food and nutrition to children and/or their families, while SSI and MFIP provide cash to meet the basic needs of families, including food. An overview of these programs is presented in Appendix A. A detailed description of the different populations these programs serve, the distinct benefits and eligibility criteria, and how applicants and recipients are often eligible for other government programs are described elsewhere (Minnesota Department of Education, 2021; Minnesota Department of Health, 2021; Minnesota Department of Human Services, 2018, 2021, 2022a, 2022b).

Families were placed into three distinct categories based on their responses to this question: (1) those who participated in SNAP and at least one of the six other assistance programs (n=457), (2) those who participated in at least one of the six assistance programs other than SNAP (n=305), and (3) those who did not participate in any of the seven possible assistance programs but had an income below 200% FPG (n=271). Analyses by participants exclusively enrolled in each one of these assistance programs was infeasible due to the limited sample size (i.e., SNAP only [n=79], WIC only [n=42], school breakfast program only [n=10], school lunch program only [n=23], SSI only [n=9], MFIP only [n=4], daycare only [n=11]). Moreover, across all study participants included in our analytic sample, 18%, 17%, 11%, and 7% were simultaneously enrolled in 2, 3, 4, and 5 assistance programs, respectively. For instance, for families included in the (1) received SNAP and at least one other type of assistance and (2) did not receive SNAP but received one or more types of assistance, approximately 83% and 70% of families, respectively, simultaneously participated in at least two assistance programs. Therefore, because (1) single program participation and (2) simultaneous participation in 3 or more assistance programs were less prevalent in our sample, we categorized families that participated in one or more assistance programs. We also chose to have SNAP and other food assistance programs in a stand-alone group to assist with the comparability of our findings because SNAP is the largest funded food assistance program in the US (Coleman-Jensen et al., 2020) and the most investigated program regarding health-related outcomes (such as child dietary intake).

**2.4.2. Food purchasing behaviors**—Participants were asked ‘*Where do you do the majority of your food shopping?*’ and could select one or more answer options from a list of establishments (e.g., grocery store, ethnic food store). Participants were then asked the most important reason for shopping at that specific location for each positive answer from these options and could select one answer option from a list of reasons (e.g., close to home, good prices). Participants were also asked ‘*When you shop for food, how do you normally get there?*’ and ‘*How often do you go food shopping for the home?*’ (Crawford et al., 2006) and could select from a list of different modes of transportation (e.g., my own car or vehicle) and shopping frequency (e.g., one big trip a month and no small trips in between), respectively. These questions were adapted from previously published work to fit with the Family Matters study population (Yoo et al., 2005). Additional questions about food shopping practices adapted from Larson et al. (Larson et al., 2010) included (1) ‘*in the past month, when shopping for food, how often did you do each of the following activities?*’ (e.g., use a written grocery list) and (2) ‘*Which of the following most influences your decision to buy a food*

*product?*' (e.g., total calories). Table 2 presents the complete list of questions asked and answer options assessing food purchasing behaviors.

**2.4.3. Home food environment**—An adapted version of the Home Food Availability inventory (Fulkerson et al., 2008) was updated with food items that reflected our sample's different racial and ethnic, and cultural diversity. Parents were asked to look at a list of food items and identify if they had any of these items in their home and were encouraged to look in all the places where they might have had food stored in the house (e.g., refrigerator, cupboards). Parents could select only one answer option for all the questions asked in this block. Questions referred to the presence of specific dairy (e.g., whole milk) and grain products (e.g., bread, rice) and included a comprehensive list of food items in which parents could select 'yes' or 'no' for their presence in the home (e.g., processed meats, desserts). Table 3 presents a complete list of the items asked. Parents were also asked to answer how many types of vegetables, fruits, low-sugar cereal, and sugared cereal they had at home. For fruits and vegetables, the answers options were '0', '1-2', '3-5', '6-8', '9-11', '12+' (recoded as 0, 1.5, 4, 7, 10, 12.5), and for low-sugar cereal and sugared cereal, the answer options were '0', '1', '2-3', '4+' (recoded as 0, 1, 1.5 and 4.5). Additional questions about home food accessibility (i.e., foods visible and easy to get to) in the home are presented in Appendix B.

**2.4.4. Child dietary intake**—Parent-reported child dietary intake was measured using a modified version of the Children's Eating Habits Questionnaire—food frequency section (CEHQ-FFQ) (Bel-Serrat et al., 2014). The CEHQ-FFQ was not designed to quantify total caloric intake or total food intake among children but instead to estimate the eating behaviors and intakes for each of the major food groups that are associated with general health status and childhood obesity (Bel-Serrat et al., 2014; Fernández-Alvira et al., 2015; Lanfer et al., 2011). Parents were asked, *'We are interested in knowing the types of foods your child eats throughout a typical week. In the past month, how many times has your child eaten* (e.g., dark-Green vegetables, fruits). Answer options included: 'never or less than 1 time/week', 'few times a week (1-3 times/week)', 'nearly every day (4-6 times/week)', '1 time/day', '2 times/day', '3+ times/day'. Parents were also asked a list of questions about child-fast food intake (e.g., traditional 'burger-and-fries' fast food restaurant [e.g., McDonald's]). Response options included: 'never/rarely', '1-3 times per month', '1-2 times per week', '3-4 times per week', '5-6 times per week', '1+ times per day'. A complete list of child dietary intake and fast-food intake items is included in Table 4. A conversion factor was used to transform child dietary intake and fast food consumption into weekly consumption frequencies, ranging from 0 to 25 and 0 to 8, respectively (Lanfer et al., 2011).

**2.4.5. Child diet quality score**—Responses to the online CEHQ-FFQ were used to create an overall diet quality score. To create this score, the Healthy Eating Index-2015 (HEI-2015) was used as a guide because it is a validated tool for measuring overall diet quality in children (Gu & Tucker, 2017; Krebs-smith et al., 2018). For the current study, 10 categories were created to match the HEI-2015: six adequacy components (Greens & Beans [5 points available], Total Vegetables [5], Total Fruit [10], Whole Grains [10], Dairy [4], Plant Proteins [5]), and four moderation components (Refined Grains [10], Sodium [10],

Saturated Fats [10], and Added Sugars [10]. Scores of the ten categories were summed, with a higher score indicating a more healthful diet quality.

**2.4.6. Sociodemographic variables**—Finally, parents also responded to a comprehensive list of sociodemographic factors including, but not limited to, child's date of birth, sex, race and ethnicity, parent's educational attainment, annual household income, employment status, place of birth, number of years living in the US (if born abroad), number of adults and children living in the home, and household food security status in the past 12 months (United States Department of Agriculture, 2012).

## 2.5. Statistical Analysis

For each of the three categories of assistance ([1] SNAP and other assistance, [2] assistance programs other than SNAP, and [3] not enrolled in any assistance), descriptive statistics (frequencies, percentages, means, standard deviations) were computed to describe the sociodemographic characteristics, food purchasing behaviors, and home food environment. We used multivariable linear regressions to evaluate the association between assistance categories (categorical) and child dietary intake factors (continuous). Models were adjusted for child age, parent and child sex, race and ethnicity, household income, primary caregiver's educational attainment, employment status, and place of birth. Means and 95 percent confidence intervals (95% CI) for child dietary intake outcomes were calculated and presented. No adjustments were made for multiple comparisons due to the exploratory nature of this study (Rothman, 2014). Data analysis was performed in Stata 16.1 (StataCorp LLC, College Station, TX).

## 3. Results

### 3.1. Assistance programs

The proportion of participants who selected each of the seven assistance program options listed in the online survey is as follows: 44% (n=457/1033) SNAP, 30% (n=313) WIC, 45% (n=463) free or reduced-cost school breakfast, 46% (n=474) free or reduced-cost school lunch, 12% (n=119) SSI, 18% (n=189) MFIP, 10% (n=99) daycare assistance, 26% (n=271) none. In this sample, 57% of families were enrolled in two or more assistance programs. In particular, 55% of families enrolled in SNAP, 38% of those enrolled in WIC, and 61% of those enrolled in free or reduced-cost school lunch were also participating in at least one other assistance program from the options provided in the survey.

### 3.2. Sociodemographic characteristics

The sociodemographic characteristics of the three assistance categories are presented in Table 1. Participants who were enrolled in SNAP and other assistance programs (n=457) were more likely to be African American (36%), single (61%), a stay-at-home caregiver, unemployed or not working for pay (50%), have a high school degree or less (73%), and with a household income less than \$20,000 (58%). Participants in assistance programs other than SNAP (n=305) and participants not enrolled in any assistance program (n=271) were more likely to be Hmong (34%) and Hispanic (28%), respectively. They also had at least a high school degree (76%), a household income of at least \$20,000 (71%),



worked full- or part-time ( 62%), and were married or in a committed relationship ( 62%). Notably, participants not enrolled in any assistance program (n=271) were more likely to be foreign-born (71%) than the participants within the two other assistance categories.

### 3.3. Food purchasing behaviors

Parents' responses to the questions regarding their food purchasing behaviors by the three categories of assistance are presented in Table 2. The majority of families enrolled in SNAP and other programs indicated that they shopped for food primarily at grocery stores, warehouses, superstores, or co-ops (57%), while the majority of families enrolled in assistance programs other than SNAP and not enrolled in any assistance programs generally shopped for food at other types of stores (e.g., farmer's market, small community grocery store) (58% and 56%, respectively). Across all three categories of assistance, participants indicated similar reasons for shopping at each specific type of food store, such as buying food items at grocery stores because it was 'close to home' ( 37%), and at superstores because of 'good prices' ( 42%). Additionally, across all three categories of assistance, the majority of parents indicated 'never' buying online ( 91%), normally using their 'own car or vehicle' to get to the place where they buy food ( 57%), and going 'food shopping for the home' in one ( 19%) to two ( 28%) big trips per months with a few small trips in between. Families across these three categories of food assistance also indicated 'often' setting a specific amount of money to spend on groceries ( 24%), 'sometimes' using a written grocery list ( 35%), 'never/rarely' using the 'ingredient list or Nutrition Facts panel before buying or choosing to eat a food product for the first time' ( 24%), and that nutritional factors are not very likely to influence their decisions to buy a food product ( 29%), except for total calories ( 12%) and sugar ( 10%).

### 3.4. Home food environment

The reported availability of food items in the home by categories of assistance is presented in Table 3. In-home availability for several food items was generally higher for participants enrolled in SNAP and other assistance programs and those enrolled in assistance programs other than SNAP relative to families not enrolled in any assistance program. Specifically, in-home availability of meat-based products (e.g., hamburger helper [ 43%]), ready-to-eat meals (e.g., ramen noodles [ 71%]), and snack foods (e.g., crackers [ 73%]) were higher for participants receiving some type of assistance relative to those who did not (e.g., hamburger helper [16%], ramen noodles [46%], and crackers [54%]). Participants in either of the two assistance categories relative to families not enrolled in any assistance program also reported, on average, having somewhat fewer varieties of vegetables (8.2, *SD* 2.9 and 8.4, *SD* 2.8 versus 8.8, *SD* 2.5) and fruits (7.8, *SD* 3.4 and 7.7, *SD* 3.4 versus 8.3, *SD* 2.9) available in the home. In the Supplemental table, in-home accessibility of food items by participation in assistance programs is presented.

### 3.5. Associations between assistance categories and child dietary intake

Table 4 presents the associations between the three categories of assistance and parent-reported child dietary and fast-food intake. In general, the average weekly consumption (i.e., average number of times item was consumed per week) of fried vegetables (3.9, 95% CI [3.4, 4.4] ;  $p=0.04$ ), whole or 2% milk (7.5, 95% CI [6.7, 8.3];  $p=0.007$ ), sugar-sweetened

beverages (4.0, 95% CI [3.5, 4.5];  $p=0.001$ ), and snack foods, such as salty snacks (4.1, 95% CI [3.7, 4.6];  $p=0.001$ ), cookies (3.5, 95% CI [3.0, 3.9];  $p=0.009$ ), and candy (2.9, 95% CI [2.5, 3.4];  $p=0.01$ ) was higher for children in the SNAP and other programs category relative to those participating in assistance programs other than SNAP (2.9, 95% CI [2.3, 3.5], 6.0, 95% CI [5.1, 7.0], 2.5, 95% CI [1.9, 3.1], 2.7, 95% CI [2.2, 3.3], 2.4, 95% CI [1.9, 2.9], and 1.9, 95% CI [1.4, 2.4], respectively) and not enrolled in any assistance programs (2.8, 95% CI [2.1, 3.6], 5.2 95% CI [4.1, 6.3], 3.3, 95% CI [2.6, 4.0], 3.3, 95% CI [2.7, 3.9], 2.5, 95% CI [1.9, 3.1], and 2.6, 95% CI [2.1, 3.2], respectively). Child consumption of vegetables, fruits, grains, 1% or skim milk, nuts and seeds, and legumes, and the overall measure of dietary intake were similar across all three assistance categories.

For child consumption of fast food, average weekly consumption of traditional “burger-and-fries” (0.9, 95% CI [0.8, 1.0]), Mexican fast-food (0.5, 95% CI [0.4, 0.6]), fried chicken (0.5, 95% CI [0.4, 0.6]), and fast-food pizza restaurants (0.8, 95% CI [0.7, 1.0]) was higher for children of families enrolled in SNAP and other assistance programs relative to those enrolled in assistance programs other than SNAP (0.7, 95% CI [0.6, 0.8], 0.3, 95% CI [0.2, 0.4], 0.3, 95% CI [0.2, 0.4], and 0.6, 95% CI [0.4, 0.7], respectively) or not enrolled in any assistance program (0.6, 95% CI [0.5, 0.8], 0.3, 95% CI [0.1, 0.4], 0.3, 95% CI [0.2, 0.5], and 0.6, 95% CI [0.5, 0.8], respectively). The weekly average child consumption at a sub shop, Asian fast food, buffet, coffee shop, or sit-down restaurants was similar across all three categories.

#### 4. Discussion

The present study described the sociodemographic characteristics, food purchasing behaviors, the home food environment, and child dietary intake across categories of participation in assistance programs among families with children living in low-income, racially and ethnically diverse, and immigrant/refugee households. Our descriptive findings showed that families enrolled in SNAP and other assistance programs had less reliable modes of transportation to go food shopping, shopped less frequently during the month, and had a higher presence of energy-dense and high-sodium food items in the home relative to those participating in assistance programs other than SNAP and not enrolled in any assistance program. Our exploratory analysis also revealed that some aspects of children’s dietary intake from families enrolled in SNAP and other assistance programs were less aligned with current dietary recommendations relative to those enrolled in assistance programs other than SNAP and not enrolled in any assistance program.

Our study expands prior research because most studies investigating health-related outcomes from SNAP program participation have not accounted for participation in multiple programs. As previously noted (Andreyeva et al., 2015), evidence from studies investigating the association between single program participation and health outcomes (e.g., dietary intake) among families living in low-income and racially and ethnically diverse households is mixed, likely because these findings are confounded with families enrollment in multiple assistance programs (Kohn et al., 2014; Newman et al., 2011). Different food assistance programs have different rules about the types of foods that can be purchased. When families receive assistance from a combination of programs, the impact on their family’s dietary

intake and related health outcomes (e.g., weight status) is likely a result of a combination of the programs in which they are enrolled. Thus, because low-income and racially and ethnically diverse families make up the largest proportion of cash and food assistance program beneficiaries, future studies investigating assistance program outcomes would benefit from collecting and presenting detailed information on which assistance programs participants are enrolled in.

Our results showed important descriptive differences regarding the sociodemographic characteristics across categories of participation in assistance programs. Approximately one-quarter of the sample reported not being enrolled in any assistance program despite a high likelihood of financial eligibility for cash and food assistance support, given their reported annual household incomes and the number of people living in the household. Notably, the majority of families not enrolled in any food assistance program were Hispanic and with the primary caregiver not born in the US. Cultural barriers, limited social connections or support from close friends and families, documentation status, and limited knowledge about these assistance programs could have played a role in preventing these families from knowing and accessing assistance programs for which they might be eligible (Munger et al., 2015). Because Hispanic families with children experience a higher prevalence of food insecurity than the US national average (Coleman-Jensen et al., 2020), outreach efforts to reduce the barriers and modify access for enrollment in this population are needed.

Several differences in food purchasing behaviors across assistance categories were observed. Noteworthy, while most families across categories of assistance reported using their vehicle when going to a food store, a larger proportion of families enrolled in SNAP and other programs indicated riding with someone else or using public transportation relative to families in the other two categories. The majority of families enrolled in SNAP and other programs also reported shopping for food less frequently relative to families participating in programs other than SNAP and those not enrolled in any assistance program. These results are consistent with previous studies investigating SNAP participants. Lack of access to transportation and distance to the nearest grocery store have been noted among SNAP participants as factors affecting consistent access to fresh fruits and vegetables (Bruening et al., 2017; Rose & Richards, 2004; Steele-Adjogon & Weatherspoon, 2017). Our results also showed that most participants across categories of assistance reported always set a specific amount of money to spend on groceries and were not likely to use a written grocery list or be influenced by nutritional factors when buying a food product. Shopping using a grocery list and reading the nutrition label has been found to predict better diet quality, especially among low-income individuals (Hersey et al., 2001; Kim et al., 2000; Wiig & Smith, 2009). Altogether, these food purchasing behaviors might lead to a lower frequency of food shopping and might impact the quantity, consistency of fruit and vegetable consumption, and overall diet quality. SNAP-Ed educators working with families eligible for assistance might consider these findings when delivering messages to assist families in making economical and wise food choices aligned with the Dietary Guidelines for Americans (DGA) (U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2020).

Regarding the home food environment, families enrolled in SNAP and other assistance programs and programs other than SNAP had an overall less healthful home food environment relative to families not enrolled in any assistance program. Our results showed higher proportions of foods high in sodium, added sugars, saturated fats reported for these two assistance categories. Noteworthy, families enrolled in SNAP and other programs were more likely to particularly report such foods than those enrolled in assistance programs other than SNAP. These results are consistent with a previous study investigating the home food environment among SNAP participants (Bruening et al., 2017).

Because food purchasing behaviors and the home food environment are known to foster healthful or less healthful eating habits among family members participating in SNAP, future studies could investigate other influences and motivators (e.g., weight control practices) for shopping behaviors that might affect the home food environment of families simultaneously participating in one or more assistance programs (Atoloye & Durward, 2019). Moreover, intervention studies that are designed to improve parents' food literacy and support families to make food decisions for themselves with the resources they have available to them might be a promising strategy (Atoloye & Durward, 2019; Austin et al., 2020; Neffa-Creech et al., 2020). Thoughtful consideration of the challenging environments in which families from low-income and racially and ethnically diverse households live is warranted for the success of such studies. It is noteworthy that despite the promise of such interventions, and in addition to the important work of public health practitioners and communities at large, the federal and state governments have the primary role in addressing the structural underlying conditions that lead to food and financial insecurity (e.g., structural racism) (Odoms-Young, 2018; Zhang & Ghosh, 2016), and in safeguarding that families with children have socioeconomic stability to facilitate food-related decisions.

While the global score of the overall healthfulness of child dietary intake was similar across assistance categories, more nuanced differences in individual components of child diet intake were observed. Results suggested that participation in SNAP and other assistance programs was generally associated with higher weekly consumption of food items that are high in sugar (e.g., cookies) and salt (e.g., salty snacks) content relative to those participating in programs other than SNAP and those not enrolled in any assistance program. Somewhat higher weekly child consumption of several fast-food items (e.g., fried chicken) was also observed among children of families participating in SNAP and other food assistance programs relative to the other two categories. These findings are consistent with prior studies conducted among SNAP participants, which suggested that they are likely to have dietary intakes of salt and discretionary energy from added sugars and fat and that exceed national recommendations, such as those provided by the DGA (Daniels et al., 2010; Johnson et al., 1999; Leung et al., 2013; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2020). Notably, our findings also demonstrated higher weekly child dietary intake of vegetables, fruits, and milk among children in the SNAP and other assistance programs and assistance programs other than the SNAP categories relative to those not enrolled in any assistance program. Overall, these distinctive findings regarding child dietary intake among families receiving assistance relative to those who are not are possibly driven by the fact that because low-income families and their children often participate in multiple food programs, these might provide

or facilitate access to more food options (nutritious or not). Thus, it is important that future studies investigating dietary intake and other health-related outcomes from cash and food assistance program participation measure and account for all assistance programs that the households participate in.

There were both strengths and limitations to this study. Our study strengths included the investigation of food purchasing behaviors, the home food environment, and aspects of child dietary intake among families who simultaneously participated in SNAP and other cash and food assistance programs. Little is known about how participation in SNAP and other assistance programs varies across food purchasing behaviors, home food environment, and aspects of child dietary intake, and thus, our study provides some insights. Additionally, these factors were investigated in a large sample of families from low-income, racially and ethnically diverse, and immigrant/refugee households. Although families across these sociodemographic factors are impacted the most regarding food insecurity and health inequalities, past studies often have limited racial and ethnic diversity. There were also study limitations. First, because of the cross-sectional study design, the results cannot be interpreted as causal. Second, all measures used were self-reported by the parent and therefore prone to measurement error and social desirability bias. Also, parents were not asked specifically about children's school breakfast and/or lunch, which might have led to underreporting of food intake. However, underestimation is likely to occur to a similar extent across the three assistance categories. Third, several of the questions asked were either adapted from validated questionnaires or developed to capture the food and nutrition-related practices that reflect the racial and ethnic diversity of the study participants. The use of validated measures is essential for accurate measurement, minimizing measurement errors, and facilitating the comparability of findings across studies (Enarson et al., 2004). However, there is a scarcity of validated measures designed to capture food and nutrition-related behaviors and practices of non-White participants in epidemiological surveys, likely due to the undue influence of white supremacy that is systematically embedded in research (Hardeman & Karbeah, 2020). Fourth, because income eligibility cutoffs vary across assistance programs (e.g., 165% FPG for SNAP, 185% for WIC), we chose to restrict our sample to a commonly used definition of low-income (i.e., 200% of FPG) (Koball & Jiang, 2018; Roberts et al., 2013). Thus, it is possible that some of the participants included in the category of not being enrolled in any of the seven possible assistance programs were indeed not eligible for receiving assistance. Finally, our study did not have information about the issuance day for neither SNAP and any of the other cash and food assistance programs investigated nor other sources of income. Because past research has indicated that the timing of other income sources does not impact cyclical food consumption and expenditure behavior, this may be expected in our study (Beatty et al., 2019).

## 5. Conclusion

In conclusion, this study provides new insights about how food purchasing behaviors, the home food environment, and child dietary intake varied across participants receiving one or more cash and food assistance benefits. Compared to households participating in assistance programs other than SNAP and not enrolled in any assistance program, families participating in SNAP and other assistance programs had less reliable modes of transportation to go food

shopping, shopped less frequently during the month, had a higher presence of energy-dense and high-sodium food items in the home, and some aspects of children's dietary intake that were not congruent with current dietary recommendations. However, children in the two assistance categories relative to those not enrolled in any assistance program had a higher average weekly intake of vegetables, fruits, and milk. Cash and food assistance programs are essential to alleviating food insecurity, particularly among low-income, racially and ethnically diverse, and immigrant/refugee populations. However, policies and programs should go beyond and seek to extend program benefits, increase coordinated outreach, and provide robust nutrition education across programs to support improved access and use of food assistance benefits to purchase healthful foods and beverages to improve children's dietary intake and overall health. Besides policy and assistance program improvements, addressing the society's structural issues that require families from low-income, racially and ethnically diverse, and immigrant/refugee households to rely on cash and food assistance programs is of utmost importance.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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## Appendix

### Appendix A

Overview of food and cash assistance programs reported by a sample of families from low-income and racially and ethnically diverse households with children in Minnesota.

| Purpose  | Food Components  | Eligibility Criteria  |
|--|--|---|
| <i>Supplemental Nutrition Assistance Program (SNAP)</i>  |  |   |
| The SNAP program provides cash benefits to eligible families to purchase food items with few restrictions. The benefit is intended to be supplemental to the household's food needs. | Except for alcoholic beverages, dietary supplements, hot foods, foods prepared and sold for on-premises consumption, live animals, gift-baskets, tobacco, and non-food items, most food items can be purchased at grocery stores, convenience stores, farmers markets, and/or other locations that display a poster sign stating that they accept Electronic Benefit | Eligible households must meet the income eligibility limit of 130% of the Federal Poverty Level. <sup>a</sup> |

| Purpose  | Food Components  | Eligibility Criteria  |
|--|--|---|
|  | Transfer (EBT, a card in which SNAP beneficiaries receive their monthly benefits).   |   |
| <i>Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)</i>   |  |   |
| The WIC program provides nutritious foods to supplement diets with specific nutrients, information on healthy eating, and referrals to health care for women, infants, and children up to age 5 living in low-income households. | In general, WIC authorized foods include milk, cheese, yogurt, soy-based beverages, tofu, peanut butter, canned fish, canned beans/peas, fruits and vegetables, fruit and vegetable juice rich in vitamin C, whole wheat and whole-grain foods, infant cereal, and iron-fortified adult cereal. WIC provides iron-fortified infant formula for infants not fully breastfed and special infant formulas and medical foods if medically indicated. Different food packages that align with current dietary guidelines exist both for children and women. | <u>Automatic Income Eligibility:</u> Women and children receiving benefits from SNAP, Medical Assistance, MN Family Investment Program (MFIP), Supplemental Security Income (SSI), Energy Assistance Program (EAP), Reduced or Free School Lunch, or Head Start are automatically income eligible for the WIC program.<br><u>Traditional Income Eligibility:</u> <sup>b</sup> Women and children may also qualify for WIC based on household size and gross income (before taxes are taken out).<br><u>Presumptive Income Eligibility:</u> <sup>b</sup> Women and children are presumptive income eligible when no one in the family is receiving benefits from any of the automatically income-eligible programs, the household includes a woman who has recently had a baby, a pregnant woman, or a child up to the age of 5, and/or the applicant is willing to apply for a Minnesota Health Care Program. |
| <i>Free or reduced school breakfast<sup>b</sup></i>  |  |   |
| The School Breakfast Program is a child nutrition program that offers breakfast to any student who attends a participating school.   | There are three required food components for breakfast: grains, fruits/vegetables, and fluid milk. The meal pattern must meet the requirements for each grade group (K-5, 6-8, 9-12). Under <i>offer versus serve</i> in the School Breakfast Program, students must select 3 food items in the required serving sizes.  | Children may be determined eligible through participation in certain federal assistance programs (e.g., SNAP) or other federally- or state-funded programs, based on their status (homeless, migrant, runaway, or foster child), based on family size and household income, and/or children from families with incomes 130% of the Federal Poverty Level.   |
| <i>Free or reduced school lunch<sup>c</sup></i>  |  |   |
| The National School Lunch Program provides nutritionally balanced, free, or reduced-cost lunches to children each school day.  | The required food components for lunches are fruits, vegetables, grains, meats/meat alternatives, fluid milk (1% or fat-free white or fat-free flavored). Lunches must offer all the USDA daily required meal pattern components, with quantities varying for each age/grade group served.   | Children may be determined eligible through participation in certain federal assistance programs (e.g., SNAP) or other federally- or state-funded programs, based on their status (homeless, migrant, runaway, or foster child), based on family size and household income, and/or children from families with incomes 130% of the Federal Poverty Level.   |
| <i>Supplemental Security Income Program (SSI)</i>  |  |   |
| The SSI program provides a monthly cash benefit to help people who are aged, blind, disabled, unable to work, and who have little or no income. It provides cash to meet basic needs for food, clothing, and shelter.            | N/A  | Recipients may be determined eligible if they have limited income, less than \$2000 in assets (\$3000 for a couple), and a disability that affects their ability to work.   |
| <i>Minnesota Family Investment Program (MFIP)</i>  |  |   |
| The Minnesota Family Investment Program (MFIP) helps families with children meet their basic needs while helping parents to find/keep a job. Parents are expected to work and are supported with both monthly cash and food      | N/A  | Eligible families with children and pregnant women qualify if: they meet an initial income test, meet an initial asset limit of \$10,000, and provide other verifications.  |

| Purpose   | Food Components  | Eligibility Criteria   |
|---|--|--|
| assistance benefits (via EBT) for up to 60 months.                                      |  |  |
| <i>Daycare<sup>d</sup></i>  |  |  |
| Children eligible for daycare assistance are provided with nutritious meals and snacks. | Participating daycares under the Child and Adult Care Food Program (CACFP) nutrition standards, meals, and snacks should include a variety of fruits, vegetables, whole grains, and a few added sugar and saturated fat food items. The standards also encourage breastfeeding and align with WIC. | Eligible children are those aged 12 and under and children aged 15 and under who are children of migrant workers. Children living in households with families with incomes 130% of the Federal Poverty Level are eligible for free meals. Participants in centers with household incomes between >130% and 185% of the Federal Poverty Level are eligible for meals at a reduced price. Children whose families receive benefits from SNAP, Food Distribution Program on Indian Reservations, or state programs funded through Temporary Assistance for Needy Families (TANF) are categorically eligible for free meals. Children participating in Head Start or Even Start programs, foster children, children experiencing homelessness are automatically eligible for free meals. |

<sup>a</sup>There are some special rules for households with elderly or people with disabilities members. Households receiving other types of assistance (e.g., Temporary Assistance for Needy Families (TANF), SSI) may be deemed “categorically eligible” for SNAP because they have already been determined eligible for another program.

<sup>b</sup>Detailed income eligibility relies on the combination of the number of household members and weekly, monthly, or yearly household income for a given year. Income eligibility differs by WIC-specific income guidelines and presumptive income eligibility guidelines.

<sup>c</sup>Descriptions about free or reduced school breakfast and lunch meals refer to schools participating in the School Breakfast Program and the National School Lunch Program.

<sup>d</sup>Descriptions about daycare refer to participating childcare centers reimbursed by the Child and Adult Care Food Program (CACFP). CACFP also provides nutritious meals and snacks to eligible adults who are enrolled for care at participating adult daycare centers.

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**Table 1.**

Sociodemographic characteristics of a sample of families from low-income and racially and ethnically diverse households with children across categories of assistance ( $N = 1,033$ ).

| Characteristics  | SNAP and other assistance programs <sup>a</sup> |           | Assistance programs other than SNAP <sup>b</sup> |           | Not enrolled in any assistance program |           | Overall <i>P</i> value |
|--|---|-----------|--|-----------|--|-----------|------------------------|
|  | <i>n</i> = 457                                  |           | <i>n</i> = 305                                   |           | <i>n</i> = 271                         |           |                        |
|  | <i>n</i>  | %         | <i>n</i>   | %         | <i>n</i>                               | %         |                        |
| <b>Primary caregiver</b>                                     |   |           |  |           |  |           |                        |
| Female   | 423   | 93        | 269  | 88        | 241                                    | 89        | 0.09                   |
| Weight status  |   |           |  |           |  |           |                        |
| Normal weight (up to 24.9)                                   | 100   | 22        | 79   | 26        | 95                                     | 35        | <0.001                 |
| Overweight (25-29.9)   | 109   | 24        | 103  | 34        | 89                                     | 33        |                        |
| Obese (30 or more)   | 248   | 54        | 122  | 40        | 87                                     | 32        |                        |
| Race/ethnicity   |   |           |  |           |  |           |                        |
| African American   | 164   | 36        | 69   | 23        | 26                                     | 10        | <0.001                 |
| Native American  | 130   | 28        | 53   | 17        | 14                                     | 5         |                        |
| Somali   | 63  | 14        | 30   | 10        | 36                                     | 13        |                        |
| Hmong  | 62  | 14        | 103  | 34        | 40                                     | 15        |                        |
| Hispanic   | 20  | 4         | 36   | 12        | 140                                    | 52        |                        |
| White  | 18  | 4         | 14   | 5         | 15                                     | 5         |                        |
| Educational attainment                                       |   |           |  |           |  |           |                        |
| Some high school or less                                     | 90  | 20        | 25   | 8         | 64                                     | 24        | <0.001                 |
| High school graduate or associate degree                     | 240   | 53        | 140  | 46        | 108                                    | 40        |                        |
| Bachelor's degree  | 107   | 23        | 117  | 38        | 72                                     | 27        |                        |
| Graduate degree  | 20  | 4         | 23   | 8         | 26                                     | 10        |                        |
| Employment status  |   |           |  |           |  |           |                        |
| Working full-time  | 125   | 27        | 174  | 57        | 116                                    | 43        | <0.001                 |
| Working part-time  | 106   | 23        | 59   | 19        | 50                                     | 18        |                        |
| Stay at home caregiver                                       | 75  | 16        | 31   | 10        | 66                                     | 24        |                        |
| Currently unemployed, but actively seeking work              | 71  | 16        | 19   | 6         | 24                                     | 9         |                        |
| Not working for pay (unable to work, retired, student, etc.) | 80  | 18        | 22   | 7         | 15                                     | 6         |                        |
| Born in the US   |   |           |  |           |  |           |                        |
| Yes  | 349   | 76        | 193  | 63        | 79                                     | 29        | <0.001                 |
| Relationship status  |   |           |  |           |  |           |                        |
| Married  | 91  | 20        | 131  | 42        | 149                                    | 55        | <0.001                 |
| Committed relationship                                       | 88  | 19        | 60   | 20        | 50                                     | 18        |                        |
| Single/Separated/Divorced/Widowed                            | 278   | 61        | 114  | 38        | 72                                     | 27        |                        |
|  | <b>Mean</b>                                     | <b>SD</b> | <b>Mean</b>                                      | <b>SD</b> | <b>Mean</b>                            | <b>SD</b> |                        |
| Age, years   | 34.6  | 8.5       | 35.2   | 8.6       | 35.0                                   | 7.4       | 0.57                   |
| BMI, kg/m <sup>2</sup>                                       | 31.3  | 7.5       | 29.7   | 7.1       | 28.3                                   | 6.8       | <0.01                  |

| Characteristics                                | SNAP and other assistance programs <sup>a</sup> |           | Assistance programs other than SNAP <sup>b</sup> |           | Not enrolled in any assistance program |           | Overall <i>P</i> value |
|--|---|-----------|--|-----------|--|-----------|------------------------|
|  | <i>n</i> = 457                                  |           | <i>n</i> = 305                                   |           | <i>n</i> = 271                         |           |                        |
|  | <i>n</i>  | %         | <i>n</i>   | %         | <i>n</i>                               | %         |                        |
| <b>Child</b>                                   |   |           |  |           |  |           |                        |
| Girl   | 218   | 48        | 154  | 51        | 131                                    | 48        | 0.75                   |
| Child BMI percentile                           |   |           |  |           |  |           | 0.03                   |
| Normal weight (<85th)                          | 263   | 58        | 198  | 65        | 167                                    | 61        |                        |
| Overweight (85th-95th)                         | 75  | 16        | 49   | 16        | 56                                     | 21        |                        |
| Obese (>=95th)                                 | 119   | 26        | 58   | 19        | 48                                     | 18        |                        |
|  | <b>Mean</b>                                     | <b>SD</b> | <b>Mean</b>                                      | <b>SD</b> | <b>Mean</b>                            | <b>SD</b> |                        |
| Age, years                                     | 7.1   | 1.5       | 7  | 1.5       | 7.1                                    | 1.5       | 0.66                   |
| Child weight, kg                               | 39.1  | 14.7      | 39.1   | 12.6      | 35.9                                   | 9.8       | 0.01                   |
| <b>Household</b>                               |   |           |  |           |  |           |                        |
| Annual household income                        |   |           |  |           |  |           | <0.001                 |
| Less than \$20,000                             | 267   | 58        | 46   | 15        | 80                                     | 29        |                        |
| \$20,000 - \$34,999                            | 138   | 30        | 94   | 31        | 91                                     | 34        |                        |
| \$35,000 or more                               | 52  | 11        | 165  | 54        | 100                                    | 37        |                        |
| Number of adults living in the home            |   |           |  |           |  |           | <0.001                 |
| One (myself only)                              | 224   | 49        | 77   | 25        | 33                                     | 12        |                        |
| Two  | 163   | 36        | 162  | 53        | 157                                    | 58        |                        |
| Three or more                                  | 70  | 15        | 66   | 22        | 81                                     | 30        |                        |
| Number of children 18 years living in the home |   |           |  |           |  |           | <0.001                 |
| One  | 52  | 11        | 32   | 10        | 28                                     | 10        |                        |
| Two  | 123   | 27        | 97   | 32        | 102                                    | 38        |                        |
| Three  | 98  | 21        | 68   | 22        | 82                                     | 30        |                        |
| Four or more                                   | 184   | 40        | 108  | 35        | 59                                     | 22        |                        |
| Household Food security                        |   |           |  |           |  |           | <0.001                 |
| High food security                             | 258   | 56        | 206  | 68        | 201                                    | 74        |                        |
| Low food security                              | 123   | 27        | 68   | 22        | 60                                     | 22        |                        |
| Very low food security                         | 76  | 17        | 31   | 10        | 10                                     | 4         |                        |

SNAP, Supplemental Nutrition Assistance Program.

<sup>a</sup>SNAP and other assistance programs: SNAP, WIC (Special Supplemental Nutrition Program for Women, Infants, and Children), free or reduced cost school breakfast, free or reduced cost school lunch, SSI (Supplemental Security Income), MFIP (Minnesota Family Investment Program), and/or daycare assistance.

<sup>b</sup>Assistance programs other than SNAP: WIC, free or reduced cost school breakfast, free or reduced cost school lunch, SSI, MFIP, and/or daycare assistance.

**Table 2.**

Food purchasing behaviors of a sample of families from low-income and racially and ethnically diverse households with children across categories of assistance ( $N = 1,033$ ).

| Variables   | SNAP and other assistance programs <sup>a</sup> |    | Assistance programs other than SNAP <sup>b</sup> |    | Not enrolled in any assistance program |    | Overall P value |
|---|---|----|--|----|--|----|-----------------|
|   | <i>n</i> = 457                                  |    | <i>n</i> = 305                                   |    | <i>n</i> = 271                         |    |                 |
|   | <i>n</i>  | %  | <i>n</i>   | %  | <i>n</i>                               | %  |                 |
| <b>Buy most foods at</b>  |   |    |  |    |  |    | <0.001          |
| Grocery store, warehouse, superstore, or co-ops   | 260   | 57 | 127  | 42 | 120                                    | 44 |                 |
| Local grocery stores, farmer's market, convenience store, ethnic store, or dollar store | 197   | 43 | 178  | 58 | 151                                    | 56 |                 |
| <b>Most important reasons for shopping at<sup>c</sup></b>                               |   |    |  |    |  |    |                 |
| <b>Grocery store (e.g., Cub, Aldi) (n=716)</b>  |   |    |  |    |  |    | 0.06            |
| Close to home   | 163   | 40 | 122  | 45 | 85                                     | 37 |                 |
| Good prices   | 130   | 32 | 73   | 27 | 74                                     | 32 |                 |
| Good quality food   | 54  | 13 | 35   | 13 | 38                                     | 17 |                 |
| Other reasons   | 56  | 14 | 42   | 15 | 31                                     | 14 |                 |
| <b>Warehouse store (e.g., Costco, Sam's Club)</b>                                       |   |    |  |    |  |    | 0.26            |
| Good prices   | 66  | 42 | 83   | 54 | 57                                     | 46 |                 |
| Good quality food   | 40  | 25 | 31   | 20 | 30                                     | 24 |                 |
| Good selection of foods   | 20  | 13 | 16   | 10 | 17                                     | 14 |                 |
| Other reasons   | 31  | 20 | 24   | 16 | 21                                     | 17 |                 |
| <b>Superstore (e.g., Walmart, Target) (n=654)</b>                                       |   |    |  |    |  |    | 0.04            |
| Good prices   | 161   | 58 | 113  | 57 | 82                                     | 44 |                 |
| Close to home   | 44  | 16 | 42   | 21 | 36                                     | 19 |                 |
| Good selection of foods   | 32  | 11 | 18   | 9  | 29                                     | 16 |                 |
| Other reasons   | 42  | 15 | 26   | 13 | 39                                     | 21 |                 |
| <b>Small community grocery store (n=175)</b>  |   |    |  |    |  |    | 0.43            |
| Close to home   | 32  | 52 | 26   | 49 | 24                                     | 40 |                 |
| It sells food from my culture/ethnicity   | 16  | 26 | 14   | 26 | 24                                     | 40 |                 |
| Good quality food   | 4   | 6  | 6  | 11 | 6                                      | 10 |                 |
| Other reasons   | 10  | 16 | 7  | 13 | 6                                      | 10 |                 |
| <b>Farmer's market (n=255)</b>  |   |    |  |    |  |    | 0.02            |
| Good quality food   | 51  | 53 | 48   | 53 | 39                                     | 58 |                 |
| Good selection of foods   | 15  | 15 | 5  | 5  | 7                                      | 10 |                 |
| It sells food from my culture/ethnicity   | 13  | 13 | 12   | 13 | 9                                      | 13 |                 |
| Other reasons   | 18  | 19 | 26   | 29 | 12                                     | 18 |                 |
| <b>Convenience store (n=91)</b>   |   |    |  |    |  |    | 0.003           |
| Close to home   | 47  | 87 | 18   | 75 | 4                                      | 31 |                 |
| It sells food from my culture/ethnicity   | 1   | 2  | 1  | 4  | 4                                      | 31 |                 |



| Variables  | SNAP and other assistance programs <sup>a</sup> |    | Assistance programs other than SNAP <sup>b</sup> |     | Not enrolled in any assistance program |    | Overall P value |
|--|---|----|--|-----|--|----|-----------------|
|  | n = 457   |    | n = 305  |     | n = 271                                |    |                 |
|  | n   | %  | n  | %   | n                                      | %  |                 |
| Good prices  | 1   | 2  | 2  | 8   | 1                                      | 8  |                 |
| Other reasons  | 5   | 9  | 3  | 13  | 4                                      | 31 |                 |
| Ethnic foods store (n=171)                           |   |    |  |     |  |    | 0.1             |
| It sells food from my culture/ethnicity              | 38  | 61 | 65   | 81  | 27                                     | 60 |                 |
| Good selection of foods                              | 5   | 8  | 5  | 6   | 3                                      | 7  |                 |
| Good quality food                                    | 9   | 15 | 4  | 5   | 2                                      | 4  |                 |
| Other reasons  | 10  | 16 | 6  | 8   | 13                                     | 29 |                 |
| Co-op (n=55)   |   |    |  |     |  |    | 0.51            |
| Good quality food                                    | 13  | 68 | 15   | 58  | 9                                      | 90 |                 |
| Good selection of foods                              | 2   | 11 | 5  | 19  | 0                                      | 0  |                 |
| Close to home  | 3   | 16 | 1  | 4   | 1                                      | 10 |                 |
| Other reasons  | 1   | 5  | 5  | 19  | 0                                      | 0  |                 |
| Dollar store (n=122)                                 |   |    |  |     |  |    | 0.64            |
| Good prices  | 47  | 68 | 20   | 74  | 18                                     | 69 |                 |
| Close to home  | 17  | 25 | 3  | 11  | 8                                      | 31 |                 |
| Close to work  | 1   | 1  | 1  | 4   | 0                                      | 0  |                 |
| Other reasons  | 4   | 6  | 3  | 11  | 0                                      | 0  |                 |
| <b>Frequency of food shopping</b>                    |   |    |  |     |  |    |                 |
| Online grocery shopping                              |   |    |  |     |  |    | 0.34            |
| Never  | 416   | 91 | 286  | 94  | 252                                    | 93 |                 |
| A few times a year                                   | 41  | 9  | 19   | 6   | 19                                     | 7  | <0.001          |
| Go food shopping for the home                        |   |    |  |     |  |    | <0.001          |
| 1 big trip a month and no small trips in between     | 34  | 7  | 9  | 3   | 11                                     | 4  |                 |
| 1 big trip a month and a few small trips in between  | 162   | 35 | 57   | 19  | 64                                     | 24 |                 |
| 2 big trips a month and no trips in between          | 21  | 5  | 15   | 5   | 15                                     | 5  |                 |
| 2 big trips a month and a few small trips in between | 134   | 29 | 117  | 38  | 75                                     | 28 |                 |
| 4 big trips a month and no trips in between          | 14  | 3  | 11   | 4   | 18                                     | 7  |                 |
| 4 big trips a month and a few small trips in between | 48  | 11 | 38   | 12  | 30                                     | 11 |                 |
| No big trips, but shop as needed                     | 44  | 10 | 58   | 19  | 58                                     | 21 |                 |
| <b>Mode of transportation for food shopping</b>      |   |    |  |     |  |    | <0.001          |
| My own car or vehicle                                | 262   | 57 | 273  | 90  | 224                                    | 83 |                 |
| I ride in a car or vehicle of my family/friends      | 106   | 23 | 21   | 7   | 32                                     | 12 |                 |
| Public transportation                                | 43  | 9  | 5  | 2   | 8                                      | 3  |                 |
| Taxi   | 20  | 4  | 2  | 0.7 | 2                                      | 1  |                 |
| Walk   | 24  | 5  | 3  | 1   | 4                                      | 1  |                 |
| Other  | 2   | <1 | 1  | <1  | 1                                      | <1 |                 |

| Variables   | SNAP and other assistance programs <sup>a</sup> |    | Assistance programs other than SNAP <sup>b</sup> |    | Not enrolled in any assistance program |    | Overall P value |
|---|---|----|--|----|--|----|-----------------|
|   | n = 457   |    | n = 305  |    | n = 271                                |    |                 |
|   | n   | %  | n  | %  | n                                      | %  |                 |
| <b>Other general decisions</b>  |   |    |  |    |  |    |                 |
| Decide on a set amount of money to spend on groceries   |   |    |  |    |  |    | 0.01            |
| Never/Rarely  | 60  | 13 | 62   | 20 | 52                                     | 19 | 0.01            |
| Sometimes   | 156   | 34 | 87   | 29 | 84                                     | 31 |                 |
| Often   | 109   | 24 | 91   | 30 | 76                                     | 28 |                 |
| Always  | 132   | 29 | 65   | 21 | 59                                     | 22 |                 |
| Use a written grocery list  |   |    |  |    |  |    | 0.18            |
| Never/Rarely  | 101   | 22 | 48   | 16 | 56                                     | 20 |                 |
| Sometimes   | 161   | 35 | 109  | 36 | 94                                     | 35 |                 |
| Often   | 108   | 24 | 92   | 30 | 62                                     | 23 |                 |
| Always  | 87  | 19 | 56   | 18 | 59                                     | 22 |                 |
| Use coupons (paper or online) or advertisements to find sale items/get a good deal                                  |   |    |  |    |  |    | 0.02            |
| Never/Rarely  | 111   | 24 | 78   | 26 | 95                                     | 35 |                 |
| Sometimes   | 181   | 40 | 136  | 45 | 105                                    | 39 |                 |
| Often   | 87  | 19 | 49   | 16 | 38                                     | 14 |                 |
| Always  | 78  | 17 | 42   | 14 | 33                                     | 12 |                 |
| Use the ingredient list or Nutrition Facts panel before buying or choosing to eat a food product for the first time |   |    |  |    |  |    | 0.22            |
| Never/Rarely  | 182   | 40 | 106  | 35 | 91                                     | 34 |                 |
| Sometimes   | 171   | 37 | 128  | 42 | 100                                    | 37 |                 |
| Often   | 59  | 13 | 45   | 15 | 44                                     | 16 |                 |
| Always  | 45  | 10 | 26   | 9  | 36                                     | 13 |                 |
| Which of the following most influences your decision to buy a food product?   |   |    |  |    |  |    | <0.001          |
| Total calories  | 57  | 12 | 57   | 19 | 65                                     | 24 |                 |
| Calories from fat   | 23  | 5  | 16   | 5  | 8                                      | 3  |                 |
| Total fat   | 26  | 6  | 14   | 5  | 16                                     | 6  |                 |
| Saturated fat   | 5   | 1  | 5  | 2  | 8                                      | 3  |                 |
| Trans fat   | 6   | 1  | 4  | 1  | 10                                     | 4  |                 |
| Cholesterol   | 9   | 2  | 3  | 1  | 7                                      | 3  |                 |
| Sodium  | 15  | 3  | 17   | 6  | 18                                     | 7  |                 |
| Carbohydrates   | 22  | 5  | 14   | 5  | 12                                     | 4  |                 |
| Fiber   | 8   | 2  | 9  | 3  | 21                                     | 7  |                 |
| Sugar   | 68  | 15 | 41   | 13 | 28                                     | 10 |                 |
| None of the above   | 218   | 48 | 125  | 41 | 78                                     | 29 |                 |

SNAP, Supplemental Nutrition Assistance Program.

<sup>a</sup>SNAP and other assistance programs: SNAP, WIC (Special Supplemental Nutrition Program for Women, Infants, and Children), free or reduced cost school breakfast, free or reduced cost school lunch, SSI (Supplemental Security Income), MFIP (Minnesota Family Investment Program), and/or daycare assistance.

<sup>b</sup> Assistance programs other than SNAP: WIC, free or reduced cost school breakfast, free or reduced cost school lunch, SSI, MFIP, and/or daycare assistance.

<sup>c</sup> The top three reasons for shopping at specific stores are presented. Possible answers included: close to home, close to work, know staff at store, good services, good prices, good quality food, good selection of foods, it sells food from my culture/ethnicity, it is clean, other. 'Other reasons' included the combination of lower cell counts among the list of reasons for shopping at.

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**Table 3.**

Characteristics of the home food environment of a sample of families from low-income and racially and ethnically diverse households with children across categories of assistance ( $N = 1,033$ ).

|  | SNAP and other assistance programs <sup>a</sup> |     | Assistance programs other than SNAP <sup>b</sup> |     | Not enrolled in any assistance program |     | Overall P value |
|--|---|-----|--|-----|--|-----|-----------------|
|  | <i>n</i> = 457                                  |     | <i>n</i> = 305                                   |     | <i>n</i> = 271                         |     |                 |
| <b>Home Food Availability</b>  | <i>n</i>  | %   | <i>n</i>   | %   | <i>n</i>                               | %   |                 |
| <b>Dairy products</b>  |   |     |  |     |  |     | <0.001          |
| All regular/full fat (e.g., whole milk)                                    | 99  | 22  | 43   | 14  | 54                                     | 20  |                 |
| All low/reduced fat (e.g., skim, 1%, 2% milk)                              | 238   | 52  | 173  | 57  | 184                                    | 68  |                 |
| A mixture of regular and low/reduced fat                                   | 106   | 23  | 75   | 25  | 24                                     | 9   |                 |
| Only have dairy alternatives (e.g. soy milk, almond milk)                  | 12  | 3   | 13   | 4   | 9                                      | 3   |                 |
| There are no dairy products in our home                                    | 2   | 0.4 | 1  | 0.3 | 0                                      | 0.0 |                 |
| <b>Grain products</b> (e.g., bread, rice, noodles, crackers)               |   |     |  |     |  |     | 0.17            |
| All whole grain/whole wheat  | 149   | 33  | 96   | 31  | 105                                    | 39  |                 |
| All refined (e.g., white) grain  | 61  | 13  | 43   | 14  | 21                                     | 8   |                 |
| A mixture of whole grain and refined grain                                 | 231   | 51  | 157  | 52  | 138                                    | 51  |                 |
| There are currently no grain products in my home                           | 16  | 3   | 9  | 3   | 7                                      | 2   |                 |
| <b>Meat-based products</b>   |   |     |  |     |  |     |                 |
| Processed meats (e.g., bologna, pepperoni, bacon, hot dogs or sausage)     | 353   | 77  | 210  | 69  | 173                                    | 64  | <0.001          |
| Hamburger helper   | 235   | 51  | 83   | 27  | 42                                     | 16  | <0.001          |
| Chicken nuggets  | 256   | 56  | 132  | 43  | 89                                     | 32  | <0.001          |
| Corn dogs  | 160   | 35  | 71   | 23  | 70                                     | 26  | 0.001           |
| <b>Meals</b>   |   |     |  |     |  |     |                 |
| Ramen noodles  | 364   | 80  | 216  | 71  | 125                                    | 46  | <0.001          |
| Canned soup  | 325   | 71  | 165  | 54  | 72                                     | 53  | <0.001          |
| Canned pasta meals (e.g., Spaghetti O's)                                   | 220   | 48  | 108  | 35  | 54                                     | 20  | <0.001          |
| Macaroni and cheese  | 373   | 82  | 199  | 65  | 142                                    | 52  | <0.001          |
| Noodle/rice dishes (e.g., Knorr Pasta Sides, Rice-a-Roni)                  | 323   | 71  | 174  | 57  | 113                                    | 41  | <0.001          |
| Frozen dinners (e.g., Kid Cuisine, Lean Cuisine)                           | 135   | 30  | 55   | 18  | 28                                     | 10  | <0.001          |
| Burritos   | 147   | 32  | 55   | 18  | 27                                     | 10  | <0.001          |
| <b>Snack foods</b>   |   |     |  |     |  |     |                 |
| Crackers, bagel chips, or popcorn  | 334   | 73  | 227  | 74  | 160                                    | 59  | <0.001          |
| Chips or cheese curls/puffs  | 273   | 60  | 161  | 53  | 120                                    | 44  | <0.001          |
| Packaged bars (e.g., granola, cereal), graham crackers, or animal crackers | 331   | 72  | 193  | 63  | 184                                    | 68  | 0.03            |
| Snack mixes or trail mix   | 196   | 43  | 127  | 42  | 146                                    | 54  | 0.01            |
| French fries, tater tots, or onion rings                                   | 273   | 60  | 108  | 35  | 67                                     | 25  | <0.001          |
| Candy (e.g., chocolate, gummy candy, hard candy)                           | 189   | 41  | 135  | 44  | 93                                     | 34  | 0.04            |
| <b>Desserts</b>  |   |     |  |     |  |     |                 |
| Frozen desserts (e.g., frozen yogurt, popsicles)                           | 313   | 68  | 199  | 65  | 181                                    | 67  | 0.64            |

|   | SNAP and other assistance programs <sup>a</sup> |           | Assistance programs other than SNAP <sup>b</sup> |           | Not enrolled in any assistance program |           | Overall P value |
|---|---|-----------|--|-----------|--|-----------|-----------------|
|   | n = 457   |           | n = 305  |           | n = 271                                |           |                 |
| <b>Home Food Availability</b>                       | <i>n</i>  | %         | <i>n</i>   | %         | <i>n</i>                               | %         |                 |
| Prepared desserts (e.g., cookies, cake)             | 229   | 50        | 141  | 46        | 97                                     | 36        | 0.001           |
| <b>Beverages</b>                                    |   |           |  |           |  |           |                 |
| Pop or soda   | 191   | 42        | 105  | 34        | 101                                    | 37        | 0.11            |
| Fruit drinks (e.g., Lemonade, Kool Aid)             | 300   | 66        | 150  | 49        | 122                                    | 45        | <0.001          |
| Sports/energy drinks (e.g., Gatorade, Red Bull)     | 182   | 40        | 94   | 31        | 73                                     | 27        | 0.001           |
|   | <b>Mean</b>                                     | <b>SD</b> | <b>Mean</b>                                      | <b>SD</b> | <b>Mean</b>                            | <b>SD</b> |                 |
| <b>Varieties of vegetables</b> (range: 0-12.5)      | 8.2   | 2.9       | 8.4  | 2.8       | 8.8                                    | 2.5       | <0.001          |
| <b>Varieties of fruits</b> (range: 0-12.5)          | 7.8   | 3.4       | 7.7  | 3.4       | 8.3                                    | 2.9       | 0.02            |
| <b>Varieties of low-sugar cereal</b> (range: 0-4.5) | 1.9   | 1.2       | 1.7  | 1.2       | 1.8                                    | 1.1       | 0.20            |
| <b>Varieties of sugared cereal</b> (range: 0-4.5)   | 1.8   | 1.2       | 1.3  | 1.1       | 1.3                                    | 1.0       | <0.001          |

SNAP, Supplemental Nutrition Assistance Program.

<sup>a</sup>SNAP and other assistance programs: SNAP, WIC (Special Supplemental Nutrition Program for Women, Infants, and Children), free or reduced cost school breakfast, free or reduced cost school lunch, SSI (Supplemental Security Income), MFIP (Minnesota Family Investment Program), and/or daycare assistance.

<sup>b</sup>Assistance programs other than SNAP: WIC, free or reduced cost school breakfast, free or reduced cost school lunch, SSI, MFIP, and/or daycare assistance.

**Table 4.**

Associations between categories of assistance and parent-reported child dietary intake of a sample of families from low-income and racially and ethnically diverse households with children ( $N = 1,033$ ).

| Child dietary intake outcome variables  | SNAP and other assistance programs <sup>a</sup> |                         | Assistance programs other than SNAP <sup>b</sup> |                           | Not enrolled in any assistance program |                           | Overall <i>P</i> value |
|---|---|-------------------------|--|---------------------------|--|---------------------------|------------------------|
|   | Predicted Mean <sup>c</sup>                     | (95% CI)                | Mean   | (95% CI)                  | Mean                                   | (95% CI)                  |                        |
| <b>Overall dietary quality score</b>  | 55.8  | (54.8, 56.8)            | 56.9   | (55.7, 58)                | 57                                     | (55.7, 58.4)              | 0.12                   |
| <b>Individual dietary components</b>  |   |                         |  |                           |  |                           |                        |
| <b>Vegetables</b>   |   |                         |  |                           |  |                           |                        |
| Dark-Green vegetables (e.g. collard greens, spinach)                                | 6.3   | (5.6, 7)                | 5.9  | (5.1, 6.7)                | 5.5                                    | (4.6, 6.4)                | 0.47                   |
| Other vegetables (e.g., tomatoes, cabbage)  | 7.4   | (6.6, 8.1)              | 7.2  | (6.3, 8)                  | 6.2                                    | (5.3, 7.2)                | 0.2                    |
| Fried vegetables (e.g., French fries, onion rings)                                  | 3.9   | (3.4, 4.4) <sup>a</sup> | 2.9  | (2.3, 3.5) <sup>b</sup>   | 2.8                                    | (2.1, 3.6) <sup>b</sup>   | 0.04                   |
| <b>Fruit</b>  |   |                         |  |                           |  |                           |                        |
| Fruit (e.g., oranges, bananas)  | 10.2  | (9.3, 11)               | 10   | (9, 10.9)                 | 9                                      | (7.9, 10.1)               | 0.26                   |
| 100% fruit juice  | 7.3   | (6.5, 8)                | 6.1  | (5.3, 7)                  | 6.6                                    | (5.6, 7.6)                | 0.17                   |
| <b>Grains</b>   |   |                         |  |                           |  |                           |                        |
| Whole grains (e.g., whole wheat bread, corn tortillas)                              | 7.4   | (6.6, 8.2)              | 7.5  | (6.6, 8.3)                | 7.3                                    | (6.3, 8.3)                | 0.97                   |
| Refined grains (e.g., white bread, flour tortillas)                                 | 6.7   | (6, 7.4)                | 7  | (6.1, 7.8)                | 6.2                                    | (5.2, 7.1)                | 0.47                   |
| <b>Milk</b>   |   |                         |  |                           |  |                           |                        |
| 1% or skim milk, white or flavored  | 6.6   | (5.8, 7.4) <sup>a</sup> | 6  | (5.1, 6.9) <sup>a,b</sup> | 4.8                                    | (3.8, 5.9) <sup>b</sup>   | 0.05                   |
| Whole or 2% milk, white or flavored   | 7.5   | (6.7, 8.3) <sup>a</sup> | 6  | (5.1, 7) <sup>b</sup>     | 5.2                                    | (4.1, 6.3) <sup>b</sup>   | 0.007                  |
| <b>Nuts and legumes</b>   |   |                         |  |                           |  |                           |                        |
| Nuts, seeds, and nut butters  | 2.9   | (2.5, 3.4)              | 2.4  | (1.9, 3)                  | 3.1                                    | (2.4, 3.7)                | 27                     |
| Legumes (e.g., beans, lentils, hummus)  | 2.8   | (2.3, 3.3)              | 2.6  | (2, 3.2)                  | 3.3                                    | (2.7, 4)                  | 0.25                   |
| <b>Beverages</b>  |   |                         |  |                           |  |                           |                        |
| Sugar sweetened drinks (e.g., fruit drinks, pop/soda)                               | 4   | (3.5, 4.5) <sup>a</sup> | 2.5  | (1.9, 3.1) <sup>b</sup>   | 3.3                                    | (2.6, 4) <sup>a,b</sup>   | 0.001                  |
| <b>Snack foods</b>  |   |                         |  |                           |  |                           |                        |
| Salty snacks (e.g., chips, pretzels)  | 4.1   | (3.7, 4.6) <sup>a</sup> | 2.7  | (2.2, 3.3) <sup>b</sup>   | 3.3                                    | (2.7, 3.9) <sup>a,b</sup> | 0.001                  |
| Baked goods (e.g., cookies, cakes)  | 3.5   | (3, 3.9) <sup>a</sup>   | 2.4  | (1.9, 2.9) <sup>b</sup>   | 2.5                                    | (1.9, 3.1) <sup>b</sup>   | 0.009                  |
| Candy (e.g., chocolate, candy bars)   | 2.9   | (2.5, 3.4) <sup>a</sup> | 1.9  | (1.4, 2.4) <sup>b</sup>   | 2.6                                    | (2.1, 3.2) <sup>a,b</sup> | 0.01                   |
| <b>Fast food</b>  |   |                         |  |                           |  |                           |                        |
| Traditional "burger-and-fries" fast food restaurant (e.g., McDonald's, Burger King, | 0.9   | (0.8, 1) <sup>a</sup>   | 0.7  | (0.6, 0.8) <sup>b</sup>   | 0.6                                    | (0.5, 0.8) <sup>b</sup>   | 0.02                   |
| Mexican fast-food restaurant (e.g., Taco Bell, Taco John's)                         | 0.5   | (0.4, 0.6) <sup>a</sup> | 0.3  | (0.2, 0.4) <sup>b</sup>   | 0.3                                    | (0.1, 0.4) <sup>b</sup>   | 0.04                   |
| Fried chicken (e.g., KFC, Popeyes)  | 0.5   | (0.4, 0.6) <sup>a</sup> | 0.3  | (0.2, 0.4) <sup>b</sup>   | 0.3                                    | (0.2, 0.5) <sup>b</sup>   | 0.007                  |
| Sandwich or sub shop (e.g., Subway, Panera)   | 0.5   | (0.4, 0.6)              | 0.4  | (0.2, 0.5)                | 0.4                                    | (0.2, 0.5)                | 0.17                   |
| Pizza place   | 0.8   | (0.7, 1) <sup>a</sup>   | 0.6  | (0.4, 0.7) <sup>b</sup>   | 0.6                                    | (0.5, 0.8) <sup>a,b</sup> | 0.02                   |

| Child dietary intake outcome variables             | SNAP and other assistance programs <sup>a</sup> |            | Assistance programs other than SNAP <sup>b</sup> |            | Not enrolled in any assistance program |            | Overall <i>P</i> value |
|--|---|------------|--|------------|--|------------|------------------------|
|  | Predicted Mean <sup>c</sup>                     | (95% CI)   | Mean   | (95% CI)   | Mean                                   | (95% CI)   |                        |
| Asian fast food (e.g., Panda Express, Leeann Chin) | 0.4   | (0.3, 0.5) | 0.3  | (0.2, 0.4) | 0.3                                    | (0.2, 0.5) | 0.42                   |
| Buffet (e.g., Old Country Buffet)                  | 0.3   | (0.2, 0.4) | 0.2  | (0.1, 0.3) | 0.3                                    | (0.2, 0.4) | 0.53                   |
| Coffee shop (e.g., Caribou, Starbucks)             | 0.2   | (0.1, 0.3) | 0.1  | (0, 0.3)   | 0.1                                    | (0, 0.3)   | 0.45                   |
| Sit-down restaurant                                | 0.5   | (0.4, 0.6) | 0.4  | (0.3, 0.5) | 0.5                                    | (0.4, 0.7) | 0.39                   |

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<sup>b</sup>Assistance programs other than SNAP: WIC, free or reduced cost school breakfast, free or reduced cost school lunch, SSI, MFIP, and/or daycare assistance.

<sup>c</sup>Linear regression models adjusted for child age, parent and child sex, race/ethnicity, household income, primary caregiver's educational attainment, employment status, and place of birth. Predicted means refer to weekly consumption (i.e., average number of times item was consumed per week). Predicted means in a row without a common superscript letter statistically differ ( $P < 0.05$ ).