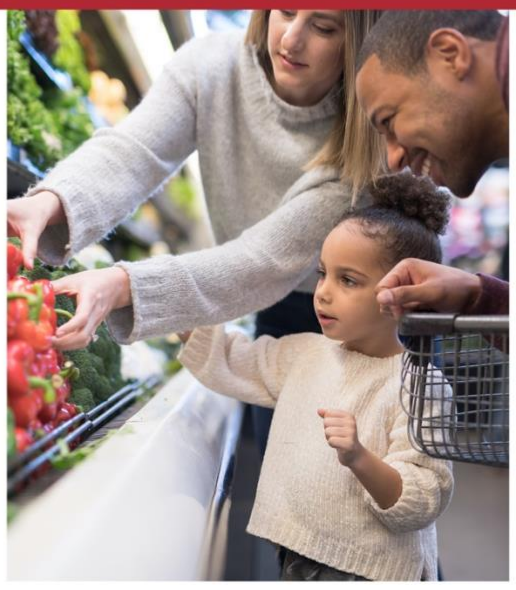
Indicators of Diet Quality, Nutrition, and Health for Americans by Program Participation Status, 2011–2016: SNAP Report

Appendix H. Matched Comparison of SNAP Participants with SNAP Plus WIC Particpants and with Income-Eligible Nonparticipants



Indicators of Diet Quality, Nutrition, and Health for Americans by Program Participation Status, 2011–2016: SNAP Report

Appendix H. Matched Comparison of SNAP Participants with SNAP Plus WIC Participants and With Income-Eligible Nonparticipants

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Appendix H. Matched Comparison of SNAP Participants With SNAP Plus WIC Participants and With Income-Eligible Nonparticipants

This appendix summarizes findings for selected measures of overall diet quality, nutrition and health, and nutrient and calorie intakes (see text box) among three comparable groups: participants of SNAP only (SNAP-only participants), participants of SNAP plus the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (SNAP plus WIC participants), and individuals who were income-eligible for SNAP but did not participate in any program (income-eligible nonparticipants). Comparisons of these outcomes are described in the text and presented in supporting tables located in section C of this appendix.

A. Introduction

This section describes the sample and details the approach used to conduct the matched analyses.

Matched Outcomes

Overall diet quality
- Total Healthy Eating Index (HEI)-2015 scores
- Component HEI-2015 scores

Indicators of nutrition and health
- Body mass index (BMI)-for-age
- Hemoglobin
- Serum vitamin D concentrations

Nutrient and energy intakes
- Total calories
- Calories from added sugars and added fats
- Calcium
- Vitamin D
- Dietary fiber
- Iron
- Potassium
- Sodium

1. Sample

Analyses were based on National Health and Nutrition Examination Survey (NHANES) 2011–2016 data. The sample was restricted to young children 1–4 years old. SNAP participants were defined in the same way as for the descriptive analyses: through an affirmative response to the NHANES survey question, "Do you/Does any member of your household currently receive SNAP or Food Stamp benefits?" (CDC NCHS, 2020c). Respondents who indicated never receiving SNAP, not receiving SNAP benefits in the past 12 months, or not currently receiving SNAP were identified as nonparticipants. Children who did not participate in SNAP were defined as income-eligible if their annual household income was less than or equal to 130 percent of the Federal Poverty Guidelines. WIC participants were also defined through an affirmative response to the NHANES survey question, "Is {SP} now receiving benefits from the WIC program?" (CDC NCHS, 2020c).

A propensity score-matching model was used to minimize observable differences between SNAP-only participants, SNAP plus WIC participants, and income-eligible nonparticipants, thereby reducing the potential for selection bias because of factors associated with both program participation and the outcomes of interest. A propensity score was estimated[1] for each child in the analysis sample from a multinomial logistic regression modeling the probability they were in each of the three comparison groups based on their characteristics. The following variables were included in the propensity score model: age, gender, race, household size, U.S. citizenship, ratio of family income to poverty guidelines,

[1] Propensity score estimation and matching were completed using the R package TriMatch version 0.9.9.

income from Supplemental Security Income, income from State/county cash assistance, and dollars spent in various categories (supermarkets or grocery stores, food purchased at other stores, eating out, and carryout/delivered food).

A propensity score could not be computed for children with a missing value for any of the variables included in the propensity score model, but the matching process retained all SNAP-only participants who were not missing information on a propensity score variable and for whom propensity score matches within a caliper of 0.25 could be identified. Among SNAP-only participants, 13 were dropped from the analysis because of missing values in the variables used for calculating propensity score, and 17 were dropped because no comparison respondents could be identified within a propensity score caliper of 0.25. SNAP plus WIC participants and income-eligible nonparticipants were matched to SNAP-only participants with replacement—meaning, for instance, that the same SNAP plus WIC participant could have served as a match for multiple SNAP-only participants. There were additional restrictions when matching three "treatment" groups. Thus, the sample for these analyses was reduced to 721 young children. Table H.1 shows summary statistics for participants and nonparticipants who were in the matched analysis sample; mean characteristics are shown for continuous variables, and sample distributions are presented for categorical variables.

Compared with matched SNAP plus WIC participants, SNAP-only participants were older, and their families spent less money on nonfood items (see table H.1). Compared with matched income-eligible nonparticipants, SNAP-only participants were slightly younger; their families spent less money on nonfood items, had a lower monthly family income, and were more likely to receive cash assistance; and they were more likely to be Black or other race/multiracial versus any other race/ethnicity.

2. Analysis

The study team tested the statistical significance of differences between two pairs of the three groups of young children for each selected outcome: SNAP-only participants and SNAP plus WIC participants, and SNAP-only participants and income-eligible nonparticipants. All tables in this appendix differentiate three levels of statistical significance ($p < .001$, .01, and .05). Measures were selected to facilitate comparisons between the groups on overall diet quality, common indicators of health (e.g., BMI), and nutrients of public health concern. Measures were otherwise limited based on available data. For example, the NHANES includes blood pressure measures only for respondents aged 8 and older, and thus, blood pressure could not be examined among young children included in this sample.

B. Findings

Overall, SNAP-only participants had similar outcomes for nearly all selected measures when compared with matched SNAP plus WIC participants and matched income-eligible nonparticipants. Specifically, the three groups were comparable regarding hemoglobin and serum vitamin D concentrations and had similar fiber, total energy, saturated fat, vitamin D, calcium, iron, potassium, and sodium intakes. The following subsections present key differences between the groups and additional context on these measures.

1. HEI-2015

The HEI-2015 assesses adherence to the 2015–2020 Dietary Guidelines for Americans (DGA) and is used to assess overall diet quality. A higher HEI score—for each component and in total—indicates a diet that

aligns more closely with the DGA. When interpreting HEI scores, a difference of five to six points between groups may be meaningful (Kirkpatrick et al., 2018). Key differences between the groups for HEI-2015 included the following:

- SNAP-only participants had lower total HEI scores than SNAP plus WIC participants (56 versus 61 points) and scored lower for three components: total fruits, greens and beans, and added sugars (see table H.2).
- SNAP-only participants had a similar total HEI score as income-eligible nonparticipants but scored differently for three components: higher for the total protein foods component and lower for the greens and beans and sodium components.

2. BMI-for-age

Weight status for children is determined using the Centers for Disease Control and Prevention (CDC) BMI-for-age percentile growth charts, which account for a child's age and gender. BMI-for-age can be used as a tool to screen for overweight and obesity (CDC, 2018); childhood weight status is of concern because being overweight or obese in childhood has been shown to persist into adulthood (Freedman et al., 2005; Must & Strauss, 1999). Overweight or obesity also increases the chances of developing chronic disease and some types of cancer (HHS, Office of Disease Prevention and Health Promotion, n.d.). Key differences between the groups for BMI-for-age included the following:

- SNAP-only participants were more likely to be underweight than income-eligible nonparticipants (5 versus 1 percent, see table H.3). There were no differences in the prevalence of overweight or obesity by matched group.

3. Added sugars

The 2015–2020 DGA recommend consuming less than 10 percent of calories per day from added sugars to achieve a healthy eating style and energy balance. Lower intakes of added sugars are associated with reduced risk of chronic disease (HHS & USDA, 2015). Key differences between the groups for added sugar consumption included the following:

- SNAP-only participants consumed a greater percentage of calories from added sugars than SNAP plus WIC participants on a given day (13 versus 11 percent of calories, see table H.9).

C. Supporting Tables

Table H.1. Characteristics of Sample Included in the SNAP and WIC Models, Continuous and Categorical Variables

Characteristic	SNAP Only		SNAP Plus WIC		Income-Eligible Nonparticipants	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
Continuous Variables						
Sample size (n)	231	–	384	–	106	–
Age in years	2.65	(0.07)	2.35 **	(0.06)	2.68	(0.11)
Family poverty–annual income ratio	0.69	(0.03)	0.69	(0.02)	0.92 ***	(0.05)
Monthly spending (dollars)						
At supermarket/grocery store	476.5	(17.90)	480.69	(15.00)	479.61	(31.37)
On nonfood items	14.74	(2.74)	23.14 *	(2.98)	44.03 *	(11.15)
On food at other stores	83.21	(9.74)	95	(9.14)	56.14	(18.46)
Eating out	62.21	(6.85)	68.98	(7.23)	79.7	(9.99)
On carryout/delivered foods	16.7	(2.65)	13.3	(1.67)	21.83	(6.96)
Categorical Variables						
Sample size (n)	231	–	384	–	106	–
Female	55.4	(0.03)	51.0	(0.03)	51.9	(0.05)
Race/ethnicity						
Mexican American	15.2	(0.02)	24.0	(0.02)	23.6 *	(0.04)
Other Hispanic	10.8	(0.02)	13.0	(0.02)	12.3 *	(0.03)
Non-Hispanic White	16.9	(0.02)	16.2	(0.02)	23.6 *	(0.04)
Non-Hispanic Black	48.9	(0.03)	38.0	(0.02)	30.2 *	(0.04)
Non-Hispanic Asian	2.2	(0.01)	3.1	(0.01)	5.7 *	(0.02)
Other race, multiracial	6.1	(0.02)	5.7	(0.01)	4.7 *	(0.02)
Citizen	99.6	(0.00)	99.5	(0.00)	98.1	(0.01)

Characteristic	SNAP Only		SNAP Plus WIC		Income-Eligible Nonparticipants	
	Mean	Standard Error	Mean	Standard Error	Mean	Standard Error
Number of people in household						
1–2	6.1	(0.02)	5.0	(0.01)	7.6	(0.03)
3–4	38.5	(0.03)	38.8	(0.02)	40.6	(0.05)
5–6	37.2	(0.03)	38.3	(0.02)	38.7	(0.05)
7 or more	18.2	(0.03)	18.0	(0.02)	13.2	(0.03)
Total savings/cash assets for the family						
Less than $500	91.6	(0.02)	92.9	(0.01)	81.3	(0.02)
$501–$1,000	2.6	(0.02)	4.3	(0.01)	7.8	(0.01)
$1,001+	5.8	(0.05)	2.9	(0.03)	10.9	(0.04)
Receives Supplemental Security Income	13.0	(0.02)	13.8	(0.02)	8.5	(0.03)
Receives cash assistance	18.2	(0.03)	20.3	(0.02)	2.8 ***	(0.02)
Monthly family income						
$0–$799	22.5	(0.03)	27.9	(0.02)	7.7 ***	(0.03)
$800–$1,649	47.8	(0.03)	44.0	(0.03)	39.4 ***	(0.05)
$1,650+	29.7	(0.03)	28.2	(0.02)	52.9 ***	(0.05)

Notes: Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences in continuous variables were tested using two-sample *t*-tests comparing SNAP-only participants with matched SNAP plus WIC participants and income-eligible nonparticipants. Differences in categorical variables were tested using chi-squared tests comparing SNAP participants with matched SNAP plus WIC participants and income-eligible nonparticipants, and significance is noted for all levels of a categorical variable with a significant chi-squared test result. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits. WIC participants consist of children in households that at the time of data collection reported receiving WIC benefits.
Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls and demographic data. Sample includes matched NHANES respondents aged 1-4 with complete day 1 dietary recall data.

Table H.2. Healthy Eating Index-2015 Scores for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Component	Maximum Possible HEI Score	Matched Young Children		SNAP Only		SNAP Plus WIC		Income-Eligible Nonparticipants	
		Mean Score	Standard Error	Mean Score	Standard Error	Mean Score	Standard Error	Mean Score	Standard Error
Sample size	–	561	–	192	–	283	–	86	–
Total fruits	5	4.9	(0.11)	4.2	(0.26)	4.8 *	(0.17)	4.8	(0.23)
Whole fruits	5	4.6	(0.20)	3.8	(0.30)	4.5	(0.31)	4.6	(0.33)
Total vegetables	5	2.0	(0.10)	1.9	(0.12)	2.1	(0.17)	2.1	(0.21)
Greens and beans	5	1.7	(0.26)	1.0	(0.20)	2.0 *	(0.37)	2.1 *	(0.49)
Whole grains	10	2.9	(0.20)	2.9	(0.39)	3.0	(0.30)	2.3	(0.29)
Dairy	10	9.6	(0.27)	8.8	(0.44)	9.3	(0.32)	8.8	(0.43)
Total protein foods	5	4.3	(0.13)	4.3	(0.20)	4.2	(0.17)	3.7 *	(0.25)
Seafood and plant proteins	5	2.4	(0.25)	2.2	(0.39)	2.6	(0.36)	3.0	(0.42)
Fatty acids	10	2.9	(0.26)	3.0	(0.40)	3.5	(0.40)	3.3	(0.42)
Refined grains	10	5.9	(0.33)	5.8	(0.50)	5.6	(0.40)	5.7	(0.41)
Sodium	10	5.8	(0.21)	5.8	(0.36)	5.7	(0.27)	7.0 *	(0.38)
Added sugars	10	7.2	(0.21)	6.4	(0.36)	7.7 **	(0.29)	6.3	(0.47)
Saturated fats	10	5.3	(0.32)	5.4	(0.44)	5.7	(0.35)	5.8	(0.40)
Total HEI-2015 score	100	59.6	(1.12)	55.5	(1.63)	60.8 *	(1.39)	59.5	(1.64)

Notes: Estimates are based on the day 1 dietary recall. Scores are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Mean component scores may not sum to total score because of rounding. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits.

HEI = Healthy Eating Index– Denotes not applicable

Sources: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls; Food Pattern Equivalents Database 2011–2012, 2013–2014, and 2015–2016. Sample includes NHANES children aged 2–4 years with complete day 1 dietary recall data.

Table H.3. Body Mass Index-for-Age Categories for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Subgroup	Matched Young Children		SNAP Only		SNAP Plus WIC		Income-Eligible Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Sample size	535	–	184	–	271	–	80	–
Underweight	2.8	(0.70)	4.5	(1.44)	2.2	(0.90)	0.9 *	(0.93)
Normal weight	72.6	(1.93)	71.5	(3.34)	72.4	(2.73)	70.5	(5.53)
Overweight	13.8	(1.48)	15.0	(2.72)	13.6	(2.06)	15.7	(4.66)
Obese	10.9	(1.36)	9.0	(2.17)	11.8	(2.05)	12.8	(4.01)

Notes: Body mass index (BMI)-for-age categories are defined as follows: underweight if BMI-for-age is < the 5th percentile in the Centers for Disease Control and Prevention BMI-for-age growth chart; healthy weight if BMI-for-age is ≥ the 5th and < the 85th percentiles; overweight if BMI-for-age is ≥ the 85th and < the 95th percentiles; and obese if BMI-for-age is ≥ the 95th percentile. Values are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits.– Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 body measures data. Sample includes NHANES children aged 2–4 years with complete day 1 dietary recall, weight, and height data.

Table H.4. Hemoglobin Status for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Subgroup	Matched Young Children		SNAP Only		SNAP Plus WIC		Income-Eligible Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Sample size	556	–	187	–	290	–	79	–
Normal	95.8	(0.90)	96.6	(1.50)	95.3	(1.27)	96.8	(2.31)
Low	4.2	(0.90)	3.4	(1.50)	4.7	(1.27)	3.2	(2.31)

Notes: For children 6–59 months old, hemoglobin levels are defined according to the World Health Organization guidelines: normal if ≥ 110 grams per liter (g/L) and low if < 110 g/L. Values are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits.
– Denotes not applicable
Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES children aged 1–4 years with complete day 1 dietary recall data and blood biomarker data.

Table H.5. Vitamin D Status for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Subgroup	Matched Young Children		SNAP Only		SNAP Plus WIC		Income-Eligible Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Sample size	368	–	115	–	199	–	54	–
Adequate	89.9	(1.58)	89.6	(2.93)	90.7	(2.04)	89.2	(4.29)
Inadequate	8.9	(1.49)	9.5	(2.85)	8.2	(1.93)	9.6	(4.14)
Associated with deficiency	1.2	(0.57)	0.9	(0.78)	1.1	(0.71)	1.3	(1.28)

Notes: Serum 25-hydroxyvitamin D levels are defined according to the Institute of Medicine guidelines: adequate if ≥ 50 and < 125 nanomoles per liter (nmol/L), inadequate if ≥ 30 to < 50 nmol/L, and associated with deficiency if < 30 nmol/L. Values are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits.

– Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES children aged 1–4 years with complete day 1 dietary recall data and blood biomarker data.

Table H.6. Dietary Fiber (Grams): Mean Usual Intakes for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Mean Usual Intake	Matched Young Children			SNAP Only			SNAP Plus WIC			Income-Eligible Nonparticipants		
	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error
Mean Usual Intake												
1–4 years old	721	10.3	(0.22)	231	9.9	(0.38)	384	10.6	(0.34)	106	11.1	(0.55)
Percent of Children With Mean Usual Intake as a Percent of Adequate Intake												
1–4 years old	721	50.4	(1.08)	231	48.5	(1.87)	384	51.5	(1.66)	106	54.5	(2.72)

Notes: Adequate intake is the recommended average daily intake level. Estimates are based on two dietary recalls per person. The data reflect nutrient intakes from foods and beverages but do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using the National Cancer Institute method. Values are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits. Standard errors were estimated using balanced repeated replication to account for complex survey design.

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls. Sample includes NHANES children 1–4 years old with complete day 1 and day 2 dietary recall data.

Table H.7. Dietary Fiber (Grams per 1,000 Calories): Mean Usual Intakes for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Mean Usual Intake	Matched Young Children			SNAP Only			SNAP Plus WIC			Income-Eligible Nonparticipants		
	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error
Mean Usual Intake												
1–4 years old	721	7.4	(0.14)	231	7.0	(0.25)	384	7.5	(0.20)	106	7.8	(0.42)
Percent of Children With Mean Usual Intake as a Percent of Adequate Intake												
1–4 years old	721	52.7	(1.02)	231	50.0	(1.80)	384	53.6	(1.42)	106	55.9	(3.03)

Notes: Adequate intake is the recommended average daily intake level. Estimates are based on two dietary recalls per person. The data reflect nutrient intakes from foods and beverages but do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using the National Cancer Institute method. Values are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits. Standard errors were estimated using balanced repeated replication to account for complex survey design.

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls. Sample includes NHANES children 1–4 years old with complete day 1 and day 2 dietary recall data.

Table H.8. Calories: Mean Usual Intakes for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Mean Usual Intake	Matched Young Children			SNAP Only			SNAP Plus WIC			Income-Eligible Nonparticipants		
	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error
1–4 years old	721	1,433	(24.1)	231	1,446	(49.6)	384	1,430	(30.1)	106	1,489	(81.3)

Notes: Estimates are based on two dietary recalls per person. The data reflect nutrient intakes from foods and beverages but do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using the National Cancer Institute method. Values are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits. Standard errors were estimated using balanced repeated replication to account for complex survey design.
Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls. Sample includes NHANES children 1–4 years old with complete day 1 and day 2 dietary recall data.

Table H.9. Saturated Fats and Added Sugars (Percentage of Calorie Intake): Mean Intakes on a Given Day for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Mean Usual Intake	Matched Young Children			SNAP Only			SNAP Plus WIC			Income-Eligible Nonparticipants		
	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error
Percent of Calories From Saturated Fat												
2–4 years old	561	11.5	(0.28)	192	11.6	(0.36)	283	11.2	(0.29)	86	12.2	(0.71)
Percent of Calories From Added Sugars												
2–4 years old	561	12.1	(0.41)	192	13.4	(0.76)	283	11.1 *	(0.65)	86	12.0	(1.01)

Notes: The 2015–2020 dietary guidelines recommend consuming less than 10 percent of calories per day from saturated fat and less than 10 percent of calories per day from added sugars. Estimates are based on the day 1 dietary recall. The data reflect nutrient intakes from foods and beverages but do not include the contribution of vitamin and mineral supplements. Values are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits.
Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls. Sample includes NHANES children 2–4 years old with complete day 1 dietary recall data.

Table H.10. Vitamin D (Micrograms): Mean Usual Intakes for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Mean Usual Intake	Matched Young Children			SNAP Only			SNAP Plus WIC			Income-Eligible Nonparticipants		
	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error
Mean Usual Intake												
1–4 years old	721	6.6	(0.22)	231	6.5	(0.33)	384	6.4	(0.28)	106	7.4	(0.69)
Percent of Children With Usual Intake Greater Than Estimated Average Requirements												
1–4 years old	721	11.5	(1.92)	231	11.1	(2.28)	384	9.8	(2.21)	106	21.1 **u**	(7.22)

Notes: Estimated average requirement is the average daily nutrient intake level estimated to meet the requirements for half the healthy children in a life stage or gender group. Estimates are based on two dietary recalls per person. The data reflect nutrient intakes from foods and beverages but do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using the National Cancer Institute method. Totals are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits. Standard errors were estimated using balanced repeated replication to account for complex survey design.
u Indicates individual estimates did not meet the standards of reliability or precision because of large coefficient of variation
Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls. Sample includes NHANES children 1–4 years old with complete day 1 and day 2 dietary recall data.

Table H.11. Calcium (Milligrams): Mean Usual Intakes for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Mean Usual Intake	Matched Young Children			SNAP Only			SNAP Plus WIC			Income-Eligible Nonparticipants		
	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error
Mean Usual Intake												
1–4 years old	721	930	(28.7)	231	897	(45.2)	384	914	(31.2)	106	1,100	(95.7)
Percent of Children With Usual Intake Greater Than Estimated Average Requirements												
1–4 years old	721	88.8	(2.49)	231	83.5	(7.38)	384	88.2	(2.59)	106	90.8	(5.59)

Notes: Estimated average requirement is the average daily nutrient intake level estimated to meet the requirements for half the healthy children in a life stage or gender group. Estimates are based on two dietary recalls per person. The data reflect nutrient intakes from foods and beverages but do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using the National Cancer Institute method. Totals are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits. Standard errors were estimated using balanced repeated replication to account for complex survey design.
Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls. Sample includes NHANES children 1–4 years old with complete day 1 and day 2 dietary recall data.

Table H.12. Iron (Milligrams): Mean Usual Intakes for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Mean Usual Intake	Matched Young Children			SNAP Only			SNAP Plus WIC			Income-Eligible Nonparticipants		
	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error
Mean Usual Intake												
1–4 years old	721	10.9	(0.32)	231	10.5	(0.52)	384	11.3	(0.43)	106	10.8	(0.71)
Percent of Children With Usual Intake Greater Than Estimated Average Requirements												
1–4 years old	721	99.6	(0.24)	231	99.8	(0.25)	384	99.5	(0.38)	106	99.4	(0.74)

Notes: Estimated average requirement is the average daily nutrient intake level estimated to meet the requirements for half the healthy children in a life stage or gender group. Estimates are based on two dietary recalls per person. The data reflect nutrient intakes from foods and beverages but do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using the National Cancer Institute method. Totals are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits. Standard errors were estimated using balanced repeated replication to account for complex survey design.
Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls. Sample includes NHANES children 1–4 years old with complete day 1 and day 2 dietary recall data.

Table H.13. Potassium (Milligrams): Mean Usual Intakes for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Mean Usual Intake	Matched Young Children			SNAP Only			SNAP Plus WIC			Income-Eligible Nonparticipants		
	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error
Mean Usual Intake												
1–4 years old	721	1,890	(42.8)	231	1,812	(59.2)	384	1,912	(52.8)	106	1,997	(110.7)
Mean Usual Intake as a Percent of Adequate Intake												
1–4 years old	721	91.1	(2.01)	231	87.5	(2.86)	384	92.2	(2.53)	106	96.0	(5.17)

Notes: Adequate intake is the recommended average daily intake level. Estimates are based on two dietary recalls per person. The data reflect nutrient intakes from foods and beverages but do not include the contribution of vitamin and mineral supplements. Usual intake was estimated using the National Cancer Institute method. Totals are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits. Standard errors were estimated using balanced repeated replication to account for complex survey design.

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls. Sample includes NHANES children 1–4 years old with complete day 1 and day 2 dietary recall data.

Table H.14. Sodium (Milligrams): Mean Usual Intakes From Foods and Beverages for Matched SNAP-Only, SNAP Plus WIC, and Income-Eligible Nonparticipant Young Children

Mean Usual Intake	Matched Young Children			SNAP Only			SNAP Plus WIC			Income-Eligible Nonparticipants		
	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error	Sample Size	Mean	Standard Error
Mean Usual Intake												
1–4 years old	721	2,086	(41.9)	231	2,118	(92.2)	384	2,099	(55.6)	106	2,144	(122.8)
Mean Usual Intake as a Percent of Adequate Intake												
1–4 years old	721	245.7	(4.93)	231	250.7	(10.99)	384	246.6	(6.55)	106	253.2	(15.11)
Percent of Children With Usual Intake Above Chronic Disease Risk Reduction Level												
1–4 years old	721	91.3	(2.17)	231	86.5	(4.26)	384	91.9	(1.63)	106	95.9	(2.66)

Notes: The sodium chronic disease risk reduction is the intake above which intake reduction is expected to reduce chronic disease risk within an apparently healthy population. Estimates are based on two dietary recalls per person. The data reflect nutrient intakes from foods and beverages but do not include the contribution of vitamin and mineral supplements or table salt. Usual intake was estimated using the National Cancer Institute method. Totals are age adjusted to account for the different age distributions of SNAP-only participants, SNAP plus WIC participants, and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with matched SNAP plus WIC participants or matched income-eligible nonparticipants. SNAP-only participants consist of children in households that at the time of data collection reported receiving SNAP benefits but not WIC benefits; SNAP plus WIC participants reported receiving both SNAP and WIC benefits. Standard errors were estimated using balanced repeated replication to account for complex survey design.
Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 dietary recalls. Sample includes NHANES children 1–4 years old with complete day 1 and day 2 dietary recall data.