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Snack Consumption by U.S. Children and Adolescents

What We Eat in America, NHANES 2017-March 2020

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Highlights

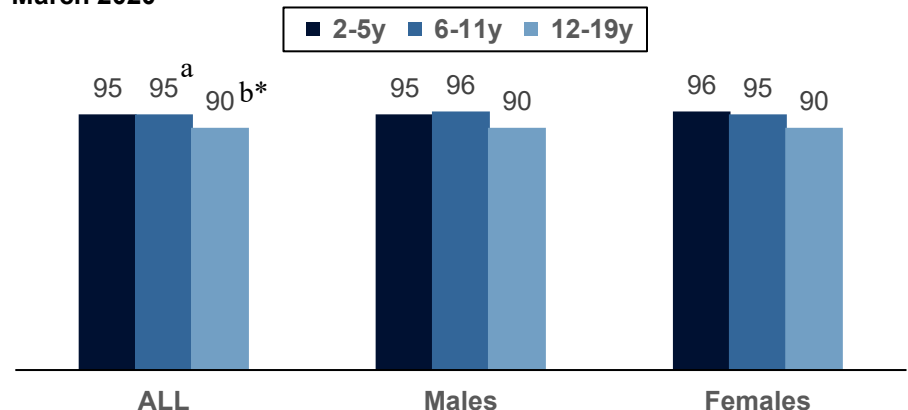
- ▶ Overall, 93% of children and adolescents report having one or more snacks on a given day. There are no differences between males and females.
- ▶ Frequency of snack consumption declines with age.
- ▶ Non-Hispanic Black children and adolescents consume snacks less frequently than other race/ethnic groups.
- ▶ Daily intakes of total energy and most nutrients by snack consumers are higher compared to non-consumers.
- ▶ Snacks contribute about one-quarter or less to total daily intakes of most nutrients by children and adolescents. However, snacks account for 42% of added sugar intakes.
- ▶ The most frequently consumed foods at snacking occasions are snacks and sweets, followed by fruit.
- ▶ Aside from water, sweetened beverages are the most frequently consumed beverages at snacks.

Snacking is generally considered to be foods and beverages consumed between meals. Fruits, vegetables, yogurt and nuts are nutrient dense snack choices that may contribute to overall nutrient intake, particularly nutrients identified by the Dietary Guidelines for Americans 2020-2025 (1) as those of concern for children and adolescents. Conversely, energy dense foods such as candy, cookies and cakes may lead to excess energy intake with little nutritional benefit. This report presents data on snack consumption among children and adolescents 2-19 years of age in the U.S. Analyses are based on one day of dietary intake data from What We Eat in America (WWEIA), NHANES 2017-March 2020. Intakes of snack consumers and non-consumers (*see definitions, p. 8*) are compared.

Who consumes snacks?

Overall, 93% of children and adolescents consume one or more snacks on a given day (*data not shown*). Similar percentages of males and females are snack consumers. As shown in Figure 1, snack consumption is higher among those 6-11 years compared to those 12-19 years. Additionally, snack consumption is inversely related to age. Among males or females, there are no differences by age.

Figure 1. Prevalence (%) of snack consumption among children and adolescents ages 2-19 years, by gender and age, WWEIA, NHANES 2017-March 2020



^{a,b} For all children and adolescents and by gender, estimates with different superscripts differ significant by age group, ($p < 0.001$) based on a two-tailed t-test.

* Inverse linear trend in snack consumption by age ($p < 0.001$), based on regression analysis

SOURCE: WWEIA, NHANES 2017-March 2020, day 1, children and adolescents 2-19 years



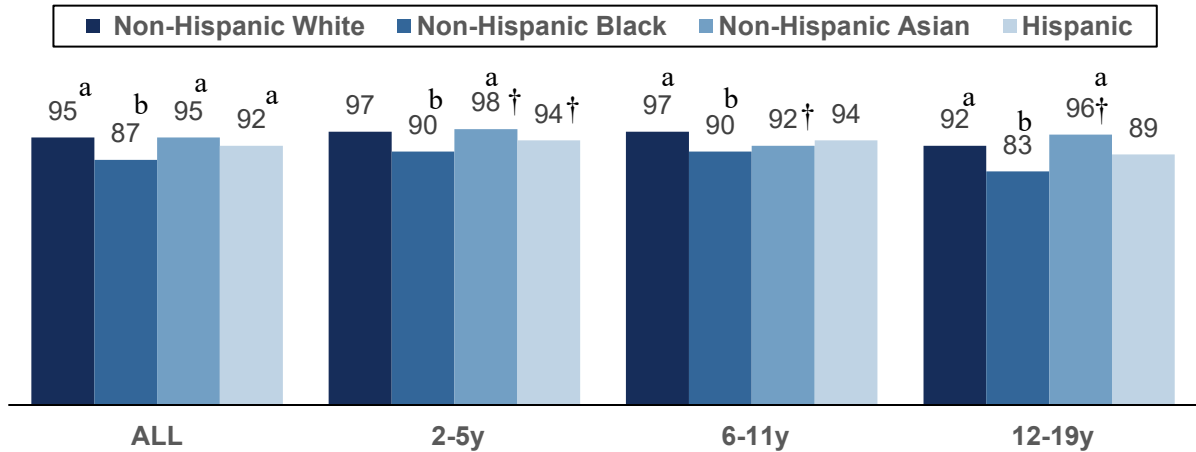
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Does the prevalence of snack consumption differ by race/ethnicity or family income?

Overall, snack consumption was less frequent among Non-Hispanic Black children and adolescents compared to other race/ethnic groups. Figure 2 shows that by age, Non-Hispanic Black children and adolescents consume snacks less frequently compared to some, but not all groups.

Figure 2. Prevalence (%) of snack consumption among children and adolescents 2-19 years, by race/ethnicity and age, WWEIA, NHANES 2017 – March 2020



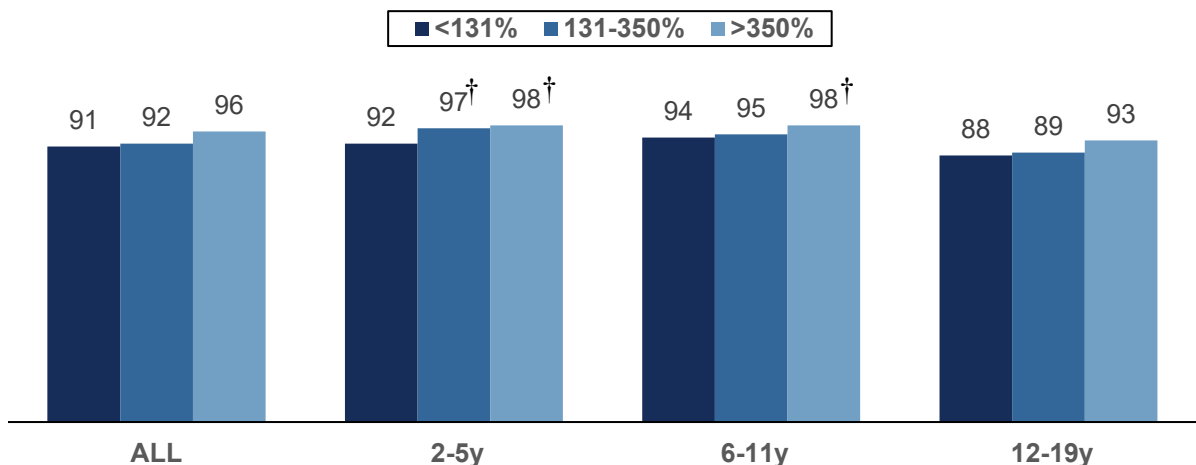
^{a,b} For all children and adolescents and by age, estimates with different superscripts differ significantly by race/ethnicity, ($p < 0.001$) based on a two-tailed *t*-test.

† indicates an estimate that may be less precise than others due to small sample size and/or large relative standard error.

SOURCE: WWEIA, NHANES 2017-March 2020, day 1, children and adolescents 2-19 years

As shown in Figure 3, there are no differences in the prevalence of snack consumption among children and adolescents when considered by family income and age

Figure 3. Prevalence (%) of snack consumption among children and adolescents 2-19 years by age and family income as % of poverty level¹, What We Eat in America, NHANES 2017 – March 2020



¹ Ratio of family income to the federal poverty guidelines expressed as a percentage (see definition of “family income”, p. 8)

† indicates an estimate that may be less precise than others due to small sample size and/or large relative standard error.

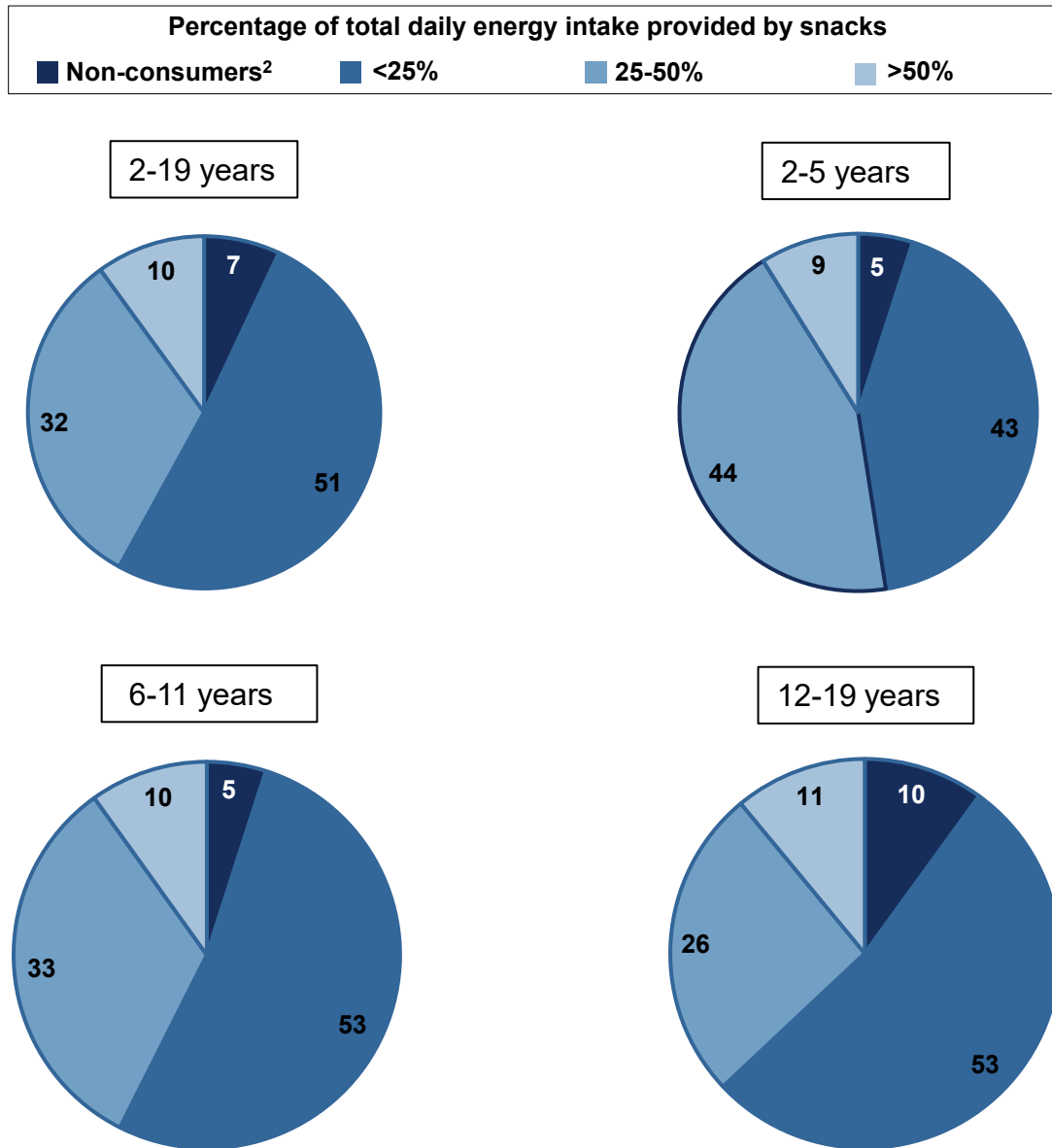
SOURCE: WWEIA, NHANES 2017-March 2020, day 1, children and adolescents 2-19 years

What percentage of total daily energy is consumed at snacks?

Overall, 7% of children and adolescents do not consume snacks (Figure 4). The percentage not consuming snacks is highest among adolescents 12-19 years (10%).

Energy intake from snacks as a percentage of total daily intake categorized into levels is shown in Figure 4 for all children and adolescents and by age. For around half, snacks contributed less than 25% to total energy intake, whereas 10% obtained over half of total daily energy intake from snacks.

Figure 4. Percentage¹ of individuals by level of total daily energy intake from snacks, children and adolescents 2-19 years, What We Eat in America, NHANES 2017 – March 2020.



¹ Estimates may not sum to 100 due to rounding.

² See definition of "consumer/non-consumer" on p. 8.

SOURCE: WWEIA, NHANES 2017-March 2020, day 1, children and adolescents 2-19 years

Do total daily intakes of energy and nutrients differ between snack consumers and non-consumers?

Table 1 shows the total energy and nutrient intake of snack consumers and non-consumers by age. Among snack consumers, dietary fiber intake is the only nutrient that is higher compared to non-consumers in all age groups. When consumption by all children and adolescents is considered, intakes of energy, carbohydrate, added sugars, fiber, calcium, iron and potassium are higher among snack consumers compared to non-consumers (*data not shown*).

Table 1. Mean daily intake of energy and selected nutrients by snack consumption¹ status among children and adolescents 2-19 years, all and by age, 2017 – March 2020

Energy/Nutrient	2-5 years		6-11 years		12-19 years	
	C	NC [†]	C	NC	C	NC
Energy (kcal) ²	1555	1289	1962	1623	2093	1747
Macronutrients and food components						
Protein (g)	54	51	65	56	76	63
Carbohydrate (g)	208	163	255*	206	259	217
Added sugars (tsp eq.)	12	8	18	13	19*	14
Dietary fiber (g)	12*	8	15*	11	15*	11
Total fat (g)	59	49	78	65	86	71
Saturated fat (g)	21	17	27	23	29	24
Vitamins						
Vitamin A (mcg RAE)	550	485	605	459	555	427
Vitamin B12 (mcg)	4	4	4	4	5	4
Vitamin C (mg)	87	65	74	59	65	51
Vitamin D (mcg)	5	6	5	5	4	3
Folate (mcg DFE)	364	434	489	458	506	417
Minerals						
Calcium (mg)	960	814	1019	829	983	806
Iron (mg)	10	10	14	12	14*	11
Potassium (mg)	2000	1724	2097*	1662	2201	1624
Sodium (mg)	2180	2035	2935	2693	3413	3019

[†] Estimate may be less reliable due to small sample size.

Abbreviations: C: Consumer; NC: Non-consumer; kcal: kilocalories; g: grams; tsp eq, teaspoon equivalents; mcg: micrograms; RAE: Retinol Activity Equivalents; mg: milligrams; DFE: Dietary folate equivalents

¹ See definition of “consumer/non-consumer” on p. 8.

² See definition of “kilocalorie” on p. 8.

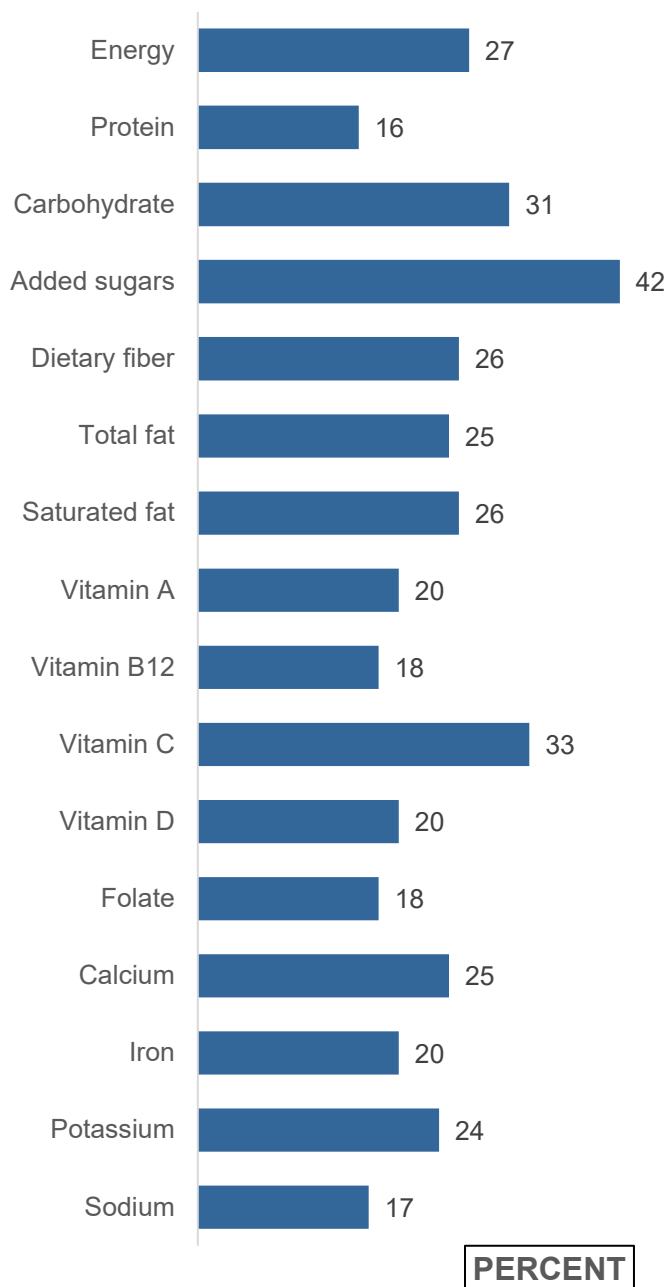
* Intake is significantly different by snack consumption status ($p < 0.001$) based on a two-tailed t-test.

SOURCE: WWEIA, NHANES 2017-March 2020, day 1, children and adolescents 2-19 years

Among snack consumers, how much do snacks contribute to total daily intakes of energy and nutrients?

Snacks account for 27% of total energy intake of children and adolescent-snack consumers. As Figure 5 illustrates, snacks contribute around one-quarter or less of daily intake for most nutrients. Notably, forty-two percent of total added sugar intake is consumed at snacks, which is explained by frequent intake of cookies/brownies and sweetened beverages (*See table 2, page 6*).

Figure 5. Contribution (%) of snacks to total daily intakes of energy and selected nutrients of snack consumers¹, children and adolescents 2-19 years, WWEIA, NHANES 2017 – March 2020



¹ See definition of “consumer/non-consumer” on p. 8.

What foods are consumed at snacks?

The most frequently consumed foods at snacks are shown in Table 2. Snacks and sweets are the most frequently consumed snacks, reported by about three-quarters of children and adolescents who snack. These include savory snacks such as chips, sweet bakery products such as cookies and brownies, and candy. About one-quarter of children and adolescents have fruit at snacks. When consumed, mixed dishes, snacks and sweets, and protein foods are the highest contributors to energy intake at snacks.

Table 2. Foods frequently consumed at snacks: Percentage of children and adolescents 2-19 years consuming and mean energy contribution when consumed, WWEIA, NHANES 2017 – March 2020.

WWEIA Food Category ¹	Consumers (%)	Mean energy contribution per consumer of a food from that category (kcal) ²
Snacks and Sweets	77	351
Savory snacks	34	222
Chips other than potato chips	13	233
Potato chips	9	185
Crackers	13	175
Sweet Bakery Products	29	306
Cookies and Brownies	21	241
Candy	25	144
Ice Cream and frozen dairy desserts	12	320
Fruit	26	114
Apples	9	113
Bananas	5	118
Dairy, excluding milk beverages	11	134
Cheese	7	129
Yogurt	5	123
Grains	11	266
Ready to eat cereals	5	270
Mixed Dishes	10	383
Sandwiches	5	361
Protein Foods	8	314
Nuts and Seeds	4	390
Vegetables	5	150

¹ See “WWEIA Food Categories “ in the Definitions on p. 8.

² kcal: kilocalories (see definitions, p. 8)

SOURCE: WWEIA, NHANES 2017-March 2020, day 1, children and adolescents 2-19 years

What beverages are consumed at snacks?

Beverages are consumed at snacks by 89% of children and adolescents. Table 3 shows that aside from water, sweetened beverages are most frequently reported. Plain milk, 100% fruit juice, tea and flavored milk are each consumed at snacks by 10% or less of children and adolescent snack consumers. Energy intake from tea is explained by common additions such as sugar, milk or cream.

Table 3. Beverages frequently consumed at snacks: Percentage of children and adolescents 2-19 years consuming and mean energy contribution when consumed, WWEIA, NHANES 2017 – March 2020

WWEIA Food Category ¹	Consumers (%)	Mean energy contribution per consumer of a beverage from that food category (kcal) ²
Beverages	89	105
Water ³	71	1
Sweetened Beverages ⁴	25	152
Milk, plain	11	155
100% juice	8	136
Tea ³	5	123
Milk, flavored	4	224

¹ See “WWEIA Food Categories” in the Definitions on p.8.

² Kcal: kilocalories (see definitions, p.8)

³ Includes milk, cream, sugar and other ingredients that may be added that may or may not contain energy

⁴ Includes soft drinks, fruit drinks, energy and sports drinks, nutritional beverages, and smoothies and grain drinks.

SOURCE: WWEIA, NHANES 2017-March 2020, day 1, children and adolescents 2-19 years

Definitions

Kilocalories (kcal): Scientific unit used in reporting the energy content of food; informally referred to as “calories”.

Snack: eating occasions designated by the respondent as “snack”, “drink” or “extended consumption” (items that were consumed over a long period of time), or the Spanish equivalents “merienda”, “entre comida”, “botana”, “bocadillo”, “tentempie”, and “bebida”. The time an eating occasion occurs has no implication as to the type of meal. An eating occasion reported during typical snack hours (i.e., between meals) is not considered to be a snack unless the participant specified it as such.

Consumer/non-consumer: In general, anyone who reported any snack occasion (*see definition above*) was considered a “consumer,” whereas anyone who did not was considered a “non-consumer”. The number of snack consumers (C) and non-consumers (NC) by age group were: 2-5 years: C=888, NC=52; 6-11 years: C=1321, NC=90; 12-19 years: C=1538, NC=202. Classification as a consumer or non-consumer for this analysis has no implications as to habitual consumption.

Family income (as percentage of poverty level): the ratio of family income to poverty guide expressed as a percentage. The Department of Health and Human Services’ poverty guidelines were used as the poverty measure to calculate the ratio (2).

WWEIA Food Categories: Available at www.ars.usda.gov/Services/docs.htm?docid=23429 is a full list of the WWEIA Food Categories (3), a scheme for classifying each food and beverage reported in WWEIA, NHANES into one of 169 mutually exclusive categories. In contrast to the WWEIA Food Categories’ item-by-item classification, this analysis classified as a group any foods or beverages that were represented in the dietary data by two or more items linked as having been consumed together. In such cases, all linked items were classified together into the most appropriate WWEIA Food Category. For example, a chicken sandwich represented in the dietary data as bread, chicken, lettuce and mayonnaise would be assigned to the Chicken sandwiches group, along with similar sandwiches that were not represented by multiple items, i.e., the “single-code sandwiches” that make up the WWEIA Food Category “mixed dishes - sandwiches (single code) – chicken sandwiches.” Similarly, if milk was reported as being consumed with tea, it was assigned to the tea group in this analysis. Another difference from the WWEIA Categories concerned the beverage analysis on page 7. In the WWEIA Food Categories, water and milk/milk beverages are in distinct main food groups- “Water” and “Milk and dairy”, respectively. In this analysis, they are included under “Beverages, nonalcoholic”. The non-beverage dairy categories, namely, cheese and yogurt, are represented on page 7 as “Dairy, excluding milk beverages”.

Data source

Estimates in this data brief are based on one day of dietary intake data from WWEIA, NHANES 2017-March 2020 (4). Day 1 dietary data were collected in person using the 5-step USDA Automated Multiple-Pass Method for the 24-hour recall. A total of 4,091 individuals 2-19 years of age and older (2,069 males and 2,023 females) provided complete and reliable dietary intake data. In the race-specific analyses (see page 2), individuals who were multi-racial or of a racial group other than those listed (N=385) were excluded. Likewise, in the income-specific analyses (also on page 2), individuals with missing family income information (N=413) were excluded. Sample weights were applied in all analyses to produce nationally representative estimates. Flagged estimates (†) may be less precise due to small sample size and/or large relative standard error, and therefore should be interpreted with caution. Intakes of energy and nutrients were calculated using the 2017-2018 and 2019-2020 versions of USDA’s Food and Nutrient Database for Dietary Studies (5). Intake of added sugars was calculated using the Food Patterns Equivalents Database for Use with WWEIA, NHANES 2017-March 2020 Prepandemic (6).

References

1. U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2020-2025. 9th Edition. December 2020. Available at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov). Accessed March 6, 2023.
2. U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. Poverty guidelines. <https://aspe.hhs.gov/poverty-guidelines>. Accessed March 6, 2023.
3. U.S. Department of Agriculture, Agricultural Research Service. 2018. What We Eat in America Food Categories 2015-2016. Available: www.ars.usda.gov/nea/bhnrc/fsrg. Accessed March 6, 2023.
4. Centers for Disease Control and Prevention, National Center for Health Statistics. *NHANES Questionnaires, Datasets, and Related Documentation*. <https://www.cdc.gov/nchs/nhanes/>. Accessed March 6, 2023.
5. USDA Food Surveys Research Group. *FNDDS Documentation and Databases*. www.ars.usda.gov/fsrg/fndds/download. Accessed March 6, 2023.
6. USDA Food Surveys Research Group. *Food Patterns Equivalents Databases and SAS Datasets*. www.ars.usda.gov/fsrg/fped/download. Accessed September 29, 2023.

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