Breakfast Consumption by U.S. Children and Adolescents

What We Eat in America, NHANES 2017-March 2020

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Highlights

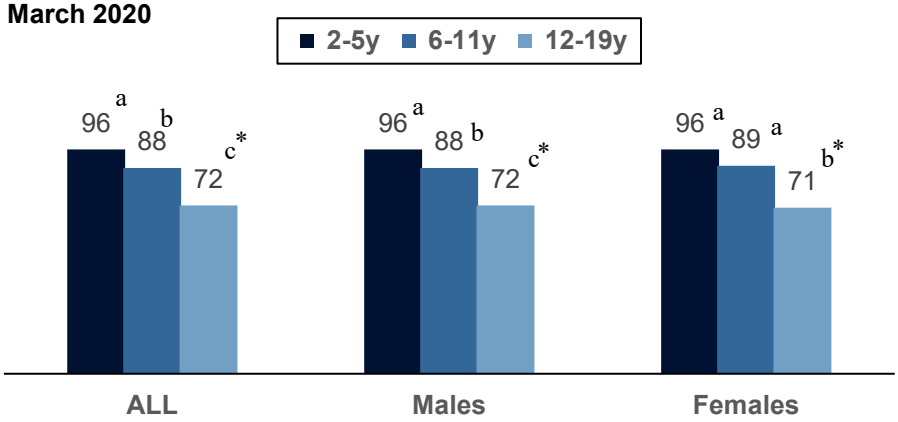
- Overall, 83% of children and adolescents report having breakfast on a given day. There were no differences between males and females.
- Breakfast consumption declines as children age.
- There are no differences in percentage who consume breakfast by race/ethnicity or family income.
- Total daily energy and most nutrient intakes of breakfast consumers are higher compared to non-consumers.
- Breakfast contributes about one-quarter to one-half to total daily nutrient intakes of children and adolescents.
- The most frequently consumed foods at breakfast are grain products, particularly ready-to-eat cereals.
- Aside from water, milk and 100% juices are the beverages most frequently consumed at breakfast.

The importance of starting the day with a healthy breakfast is a well-established view. It refuels the body's energy stores after an overnight fast and has been associated with better nutrient intake and diet quality (*1,2*). Among children and adolescents, skipping breakfast has been associated with higher risk for overweight and obesity, and with abnormal indicators of cardiometabolic risk (*3,4*). Though research is inconclusive, eating breakfast has been related to better cognitive function and academic performance. (*5,6*). This report presents data on breakfast 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 breakfast consumers and non-consumers (*see definitions, p. 8*) are compared.

Who consumes breakfast?

Overall, 83% of children and adolescents consume breakfast on a given day (*data not shown*). Similar percentages of males and females are breakfast consumers. However, the percentage of children and adolescents who are breakfast consumers differs by age, except between females 2-5 and 6-11 years. As Figure 1 illustrates, breakfast consumption was inversely related to age.

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



[a,b,c] 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 breakfast 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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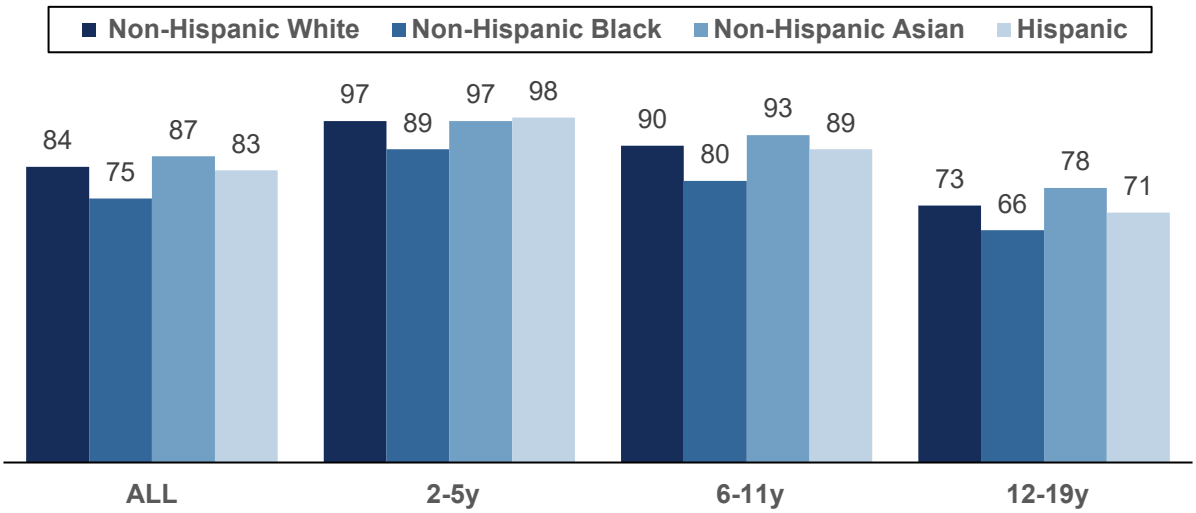
Does the prevalence of breakfast consumption differ by race/ethnicity or family income?

There are no differences in the prevalence of breakfast consumption by race/ethnicity among all children and adolescents or by age group . Prevalence of breakfast consumption also did not differ by race/ethnicity among males and females (*data not shown*).

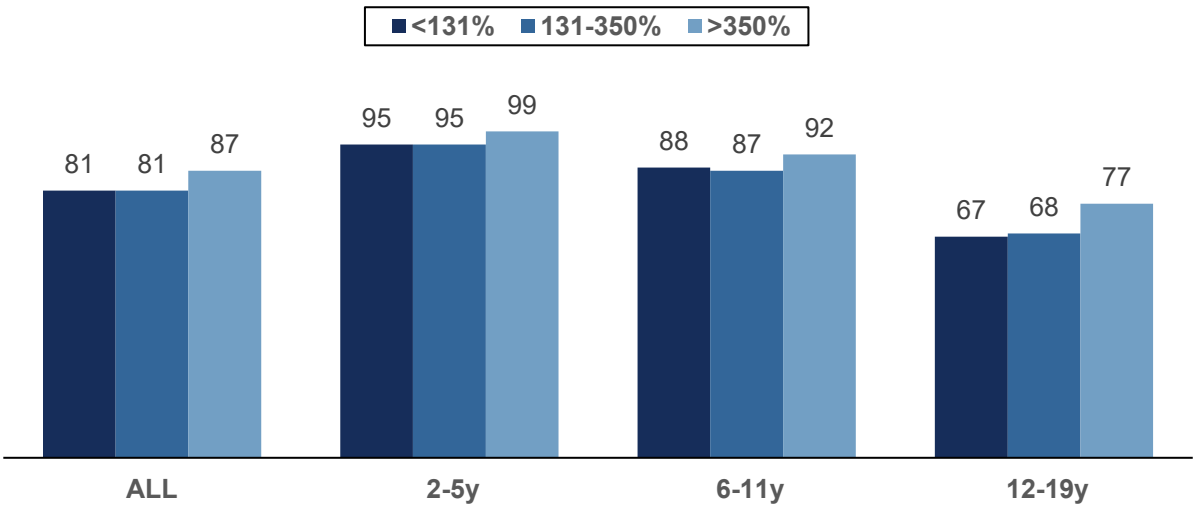
Figure 2. Prevalence (%) of breakfast consumption among children and adolescents 2-19 years, by race/ethnicity and age, WWEIA, NHANES 2017 – March 2020



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 breakfast consumption among children and adolescents when family income is considered by age group. By gender, breakfast consumption does not differ by income level (*data not shown*).

Figure 3. Prevalence (%) of breakfast reporting among children and adolescents 2-19 years by age and family income as % of poverty level[1], 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", page 8)

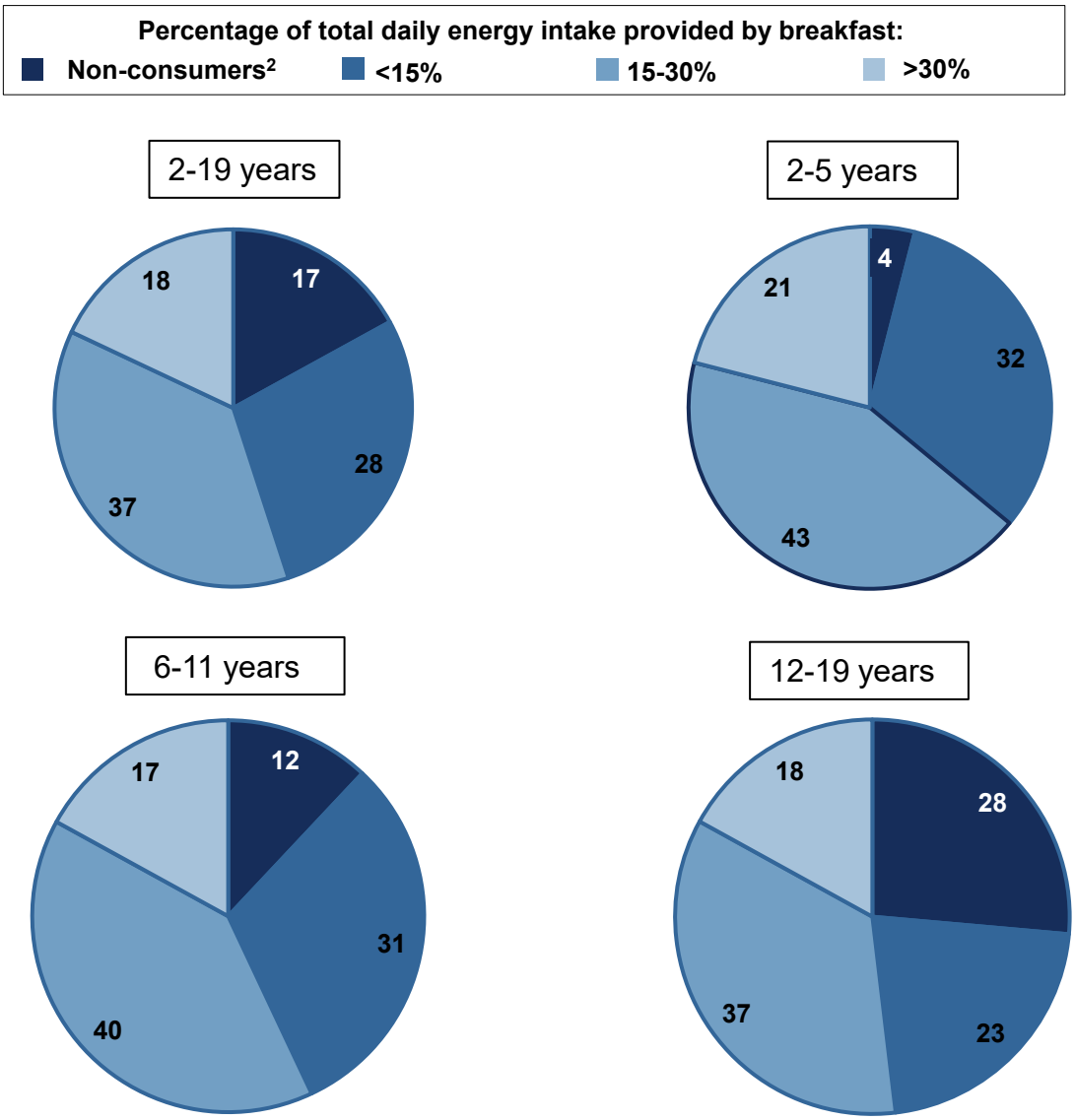
SOURCE: WWEIA, NHANES 2017-March 2020. day 1, children and adolescents 2-19 years

What percentage of total daily energy is consumed at breakfast?

Overall, 17% of children and adolescents were non-consumers of breakfast (Figure 4). The percentage not consuming breakfast was lowest among those 2-5 years (4%) and highest among adolescents 12-19 years (28%).

Energy intake from breakfast as a percentage of total daily intake categorized into levels is shown in Figure 4 for all children and adolescents and by age. For about one-third or more of children and adolescents, breakfast contributed 15-30% to total energy intake, particularly among younger age groups.

Figure 4. Percentage[1] of individuals by level of total daily energy intake from breakfast, 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 page 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 breakfast consumers and non-consumers?

Table 1 shows the total energy and nutrient intake of breakfast consumers and non-consumers by age. Among consumers, intakes of energy and most micronutrients are higher compared to non-consumers in each age group. The only micronutrient for which there are no significant differences among all ages is Vitamin E.

Table 1. Mean daily intake of energy and selected nutrients by breakfast consumption[1] 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]	1556	1207	1980*	1691	2188*	1729
Macronutrients and food components						
Protein (g)	54	40	66	59	80*	62
Carbohydrate (g)	207	161	259*	207	272*	209
Added sugars (tsp eq.)	11	11	18	15	19	17
Dietary fiber (g)	12*	7	15*	12	16*	11
Total fat (g)	59	46	78	71	89*	72
Saturated fat (g)	21	15	28	24	30*	24
Vitamins						
Vitamin A (mcg RAE)	558*	261	619	435	604*	383
Vitamin B12 (mcg)	4*	2	4	4	5	4
Vitamin C (mg)	87	60	77*	47	69*	49
Vitamin D (mcg)	6	3	5*	3	5*	3
Folate (mcg DFE)	374*	201	504*	366	547*	369
Minerals						
Calcium (mg)	967*	583	1036*	812	1060*	724
Iron (mg)	11*	6	14*	10	15*	10
Potassium (mg)	2011*	1376	2119*	1751	2324*	1681
Sodium (mg)	2189	1758	2942	2781	3551*	2920

† Estimate may be less reliable due to small sample size and/or large relative standard error
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 page 8.
[2] See definition of "kilocalorie' on page 8.

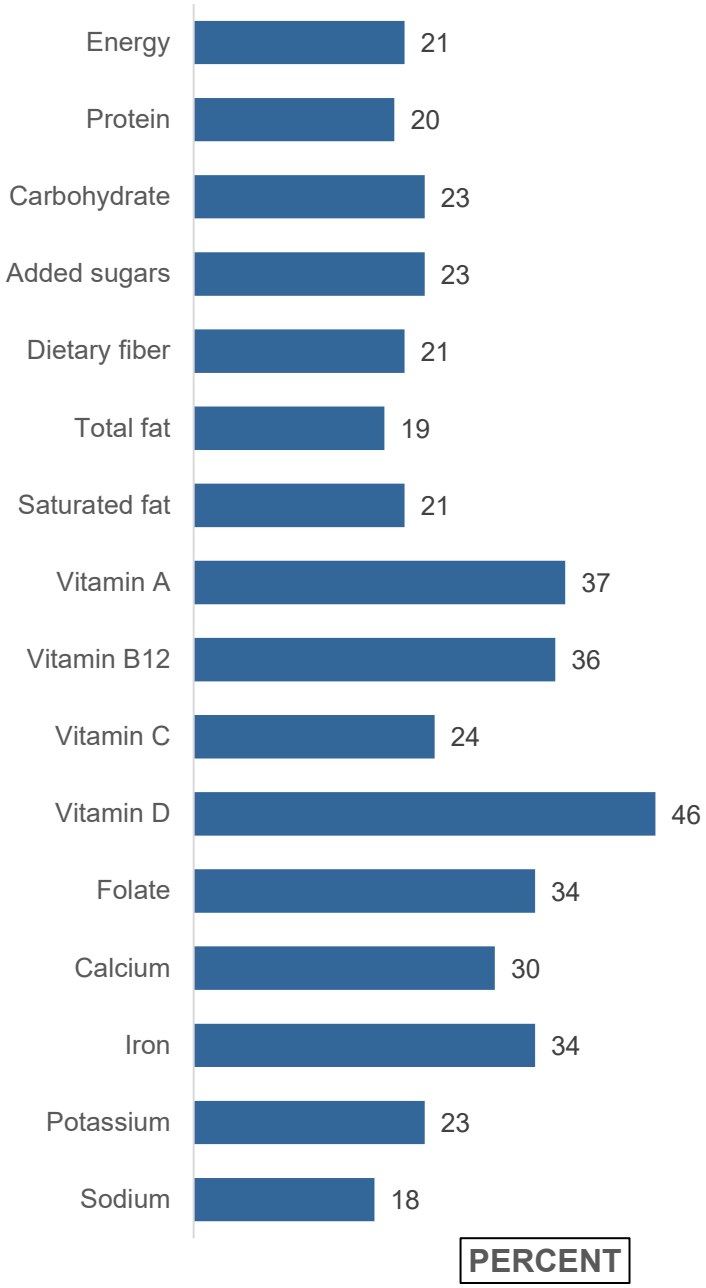
** Intake is significantly different by breakfast consumption status (p<0.001) based on a two-tailed t-test.*

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

Among breakfast consumers, how much does breakfast contribute to total daily intakes of energy and nutrients?

Breakfast contributes 21% to total energy intake of children and adolescents, with similar contributions to protein, carbohydrate and fat intakes. As Figure 5 illustrates, breakfast contributes around one-quarter to one-third of daily intake for most nutrients.

Figure 5. Contribution (%) of breakfast to total daily intakes of energy and selected nutrients of breakfast consumers[1], children and adolescents 2-19 years, WWEIA, NHANES 2017 – March 2020



[1] *See definition of "consumer/non-consumer' on page 8.*

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

What foods are consumed at breakfast?

The most frequently consumed foods at breakfast are shown in Table 2. Grains, primarily ready-to-eat cereal are reported by the highest percentage (60%) of breakfast consumers. Energy intake from grain products includes common additions to these foods. Examples are sugar, milk, and fruit added to cereal, and butter and jelly added to toast; butter added to pancakes. However, the foods contributing the most energy at breakfast are egg/breakfast sandwiches and sweet bakery products.

Table 2. Foods frequently consumed at breakfast: 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]
Grains	**60**	**285**
Ready-to-Eat Cereals[3]	31	260
Quick Breads and Bread Products	14	370
Pancakes, Waffles, French toast	11	376
Mixed Dishes	**16**	**408**
Sandwiches	11	390
Egg/breakfast sandwiches	5	428
Peanut butter sandwiches[3]	2	284
Snacks and Sweets	**16**	**321**
Sweet Bakery Products	10	415
Doughnuts, Sweet Rolls, Pastries	8	411
Protein Foods	**16**	**215**
Eggs and omelets[3]	10	165
Bacon	3	99
Sausage	3	148
Fruit	**15**	**91**
Apples	4	114
Bananas	4	112
Citrus fruits	3	58
Vegetables	**3**	**176**
French fries and other fried potatoes	2	205

[1] See "WWEIA Food Categories " in the Definitions on page 8.
[2] kcal: kilocalories (see definitions, page 8)
[3] Includes ingredients that may typically be added such as milk, sugar, fruit to cereal, jelly to toast and sandwiches, and vegetables, meat or cheese to eggs and omelets

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

What beverages are consumed at breakfast?

Beverages are consumed at breakfast by 71% of children and adolescents. Table 3 shows the most frequently consumed beverages at breakfast. Aside from water, milk is most frequently reported, followed by 100% fruit juices. Flavored milk and sweetened beverages are each reported by 8% and they provide more energy compared to other beverages. Energy intake from coffee and tea is explained by common additions such as sugar, milk or cream.

Table 3. Beverages frequently consumed at breakfast: 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	71	101
Water	27	1
Milk, plain	17	129
100% juice	13	102
Citrus juice	7	115
Flavored milk	8	187
Sweetened Beverages[3]	8	151
Coffee[4]	4	106
Tea[4]	3	93

[1] See "WWEIA Food Categories" in the Definitions on page 8.
[2] *Kcal: kilocalories (see definitions, p,9)*
[3] *Includes soft drinks, fruit drinks, energy and sports drinks, nutritional beverages, and smoothies and grain drinks.*
[4] *Includes milk, cream, sugar and other ingredients that may be added that may or may not contain kcal.*

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".

Breakfast: meal occasions designated by the respondent as "breakfast" or the Spanish equivalents "desayuno", and "almuerzo". The time an eating occasion occurs has no implication as to the type of meal. An eating occasion reported during typical breakfast hours (i.e., morning) is not considered to be breakfast unless the participant specified it as such.

Consumer/non-consumer: In general, anyone who reported any breakfast occasion *(see definition above)* was considered a "consumer," whereas anyone who did not was considered a "non-consumer". The number of breakfast consumers (C) and non-consumers (NC) by age group were: 2-5 years: C=895, NC=45; 6-11 years: C=1210, NC=201; 12-19 years: C=1174, NC=566.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 *(7)*.

WWEIA Food Categories: Available at *www.ars.usda.gov/Services/docs.htm?docid=23429* is a full list of the WWEIA Food Categories *(8)*, 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, an egg, cheese and bacon sandwich represented in the dietary data as an English muffin, egg, bacon, cheese, and butter would be assigned to the "Egg/breakfast 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) – Egg/breakfast sandwiches." Similarly, if creamer was reported as being consumed with coffee, it was assigned to the coffee 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 *(8)*. 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. 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 *(10)*. Intake of added sugars was calculated using the Food Patterns Equivalents Database for Use with WWEIA, NHANES 2017-March 2020 Prepandemic *(11)*.

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