



Food Surveys Research Group
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Convenience Stores: Source of Food/Beverages among Children

What We Eat in America, NHANES 2015-2018

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Highlights

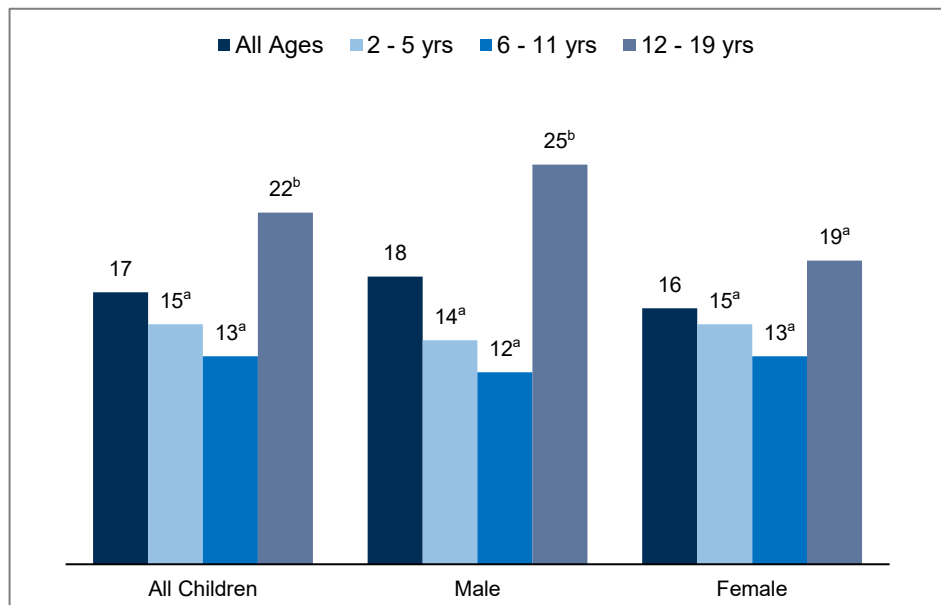
- On any given day, 1 out of 6 children consumed at least one food and/or beverage from a convenience store, with a greater percentage for adolescents than for younger children.
- Approximately half of the daily energy intake obtained from convenience store food/beverages was consumed at snack occasions.
- When consumed, food/beverages from convenience stores contributed approximately one-sixth of total daily energy and one-third of total daily added sugars.
- Sweetened beverages were the most commonly consumed food/beverage from a convenience store, followed by savory snacks and candy. The types of food/beverages from convenience stores were similar across age groups.

In the U.S. there are about 150,000 convenience stores, more than three times the number of grocery stores (1,2). Food and beverage sales in convenience stores have increased over the past several years (2,3). Using data from What We Eat in America, NHANES 2015 – 2018, this report presents results on convenience stores as a source of food and beverage consumption among U.S. children, ages 2-19 years by the following age groups: 2-5 years, 6-11 years and 12-19 years (adolescents). For this report, convenience stores also include dollar stores, drug stores, gas stations, gift shops and liquor/beer stores.

What percentage of children consumed food/beverages from convenience stores?

Overall, 17% of U.S. children consumed at least one food and/or beverage, excluding plain bottled water, obtained from a convenience store on any given day. The percentage was greater for adolescents (12-19 years) among all children (22%) and among males (25%) compared to both younger groups; the difference was not statistically significant among females.

Figure 1. Percentage of children consuming food/beverages from convenience store, by age group, 2015-2018



^{a,b} Among all children and within gender, percentages with different superscript letters are significantly different, p<0.01
 SOURCE: What We Eat in America, NHANES 2015-2018, day 1, individuals 2 - 19 years



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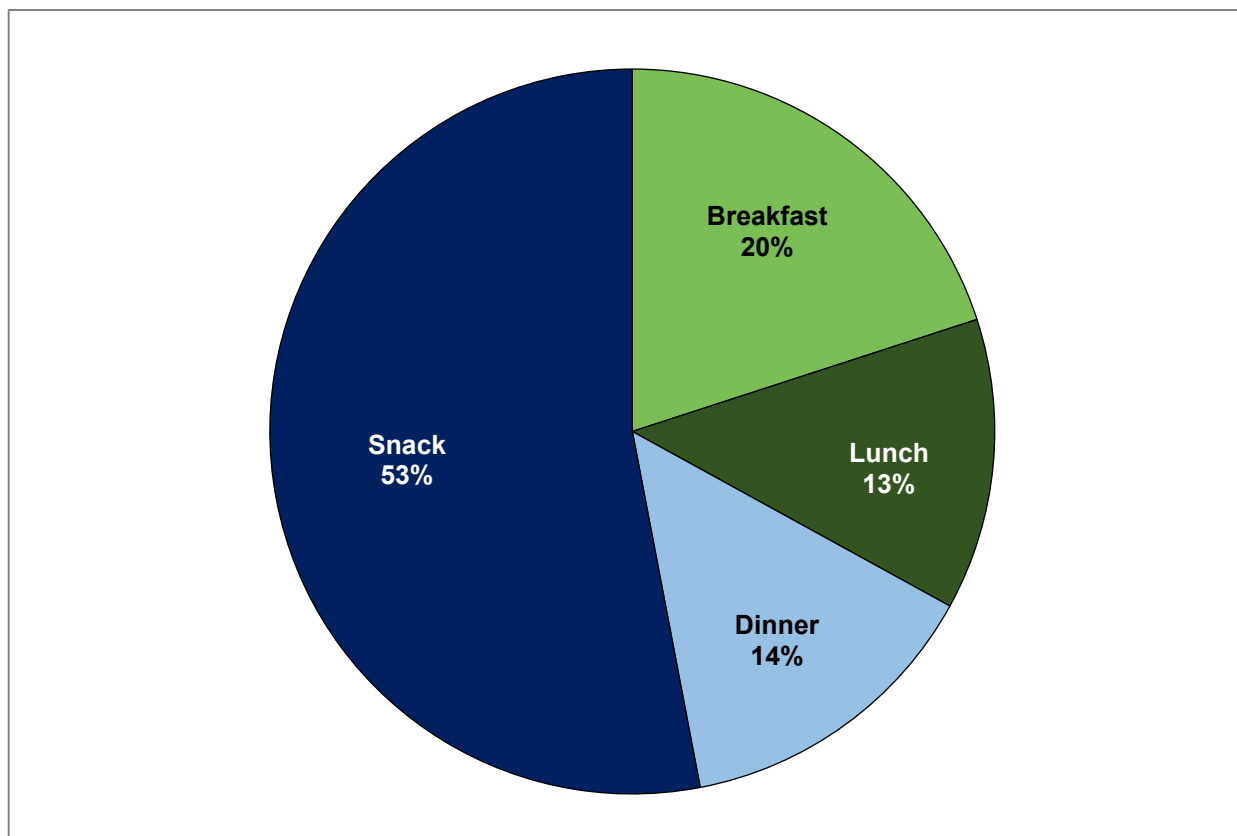
www.ars.usda.gov/nea/bhnrc/fsrg

Energy intake from food/beverages from convenience stores: At what eating occasions was most energy consumed?

For the U.S. population, food/beverages obtained from convenience stores contributed 3% of the total energy for all children (*data not shown*). This report will now present results for “convenience store reporters” (children who consumed at least one food and/or beverage from a convenience store).

Among convenience store reporters, an average of 343 kilocalories (17% of total daily energy intake) came from food/beverages from convenience stores. On the day consumed, 53% of energy consumption from these food/beverages occurred during snack occasions. For meals, energy consumption was 20%, 13% and 14% during breakfast, lunch and dinner, respectively. The distribution of the percentage of energy consumption from convenience store food/beverages across eating occasions was not significantly different among age groups.

Figure 2. Percentage of daily energy intake of food/beverages from convenience stores among children who are convenience store reporters, by eating occasion, 2015-2018



SOURCE: What We Eat in America, NHANES 2015-2018, day 1, individuals 2-19 years

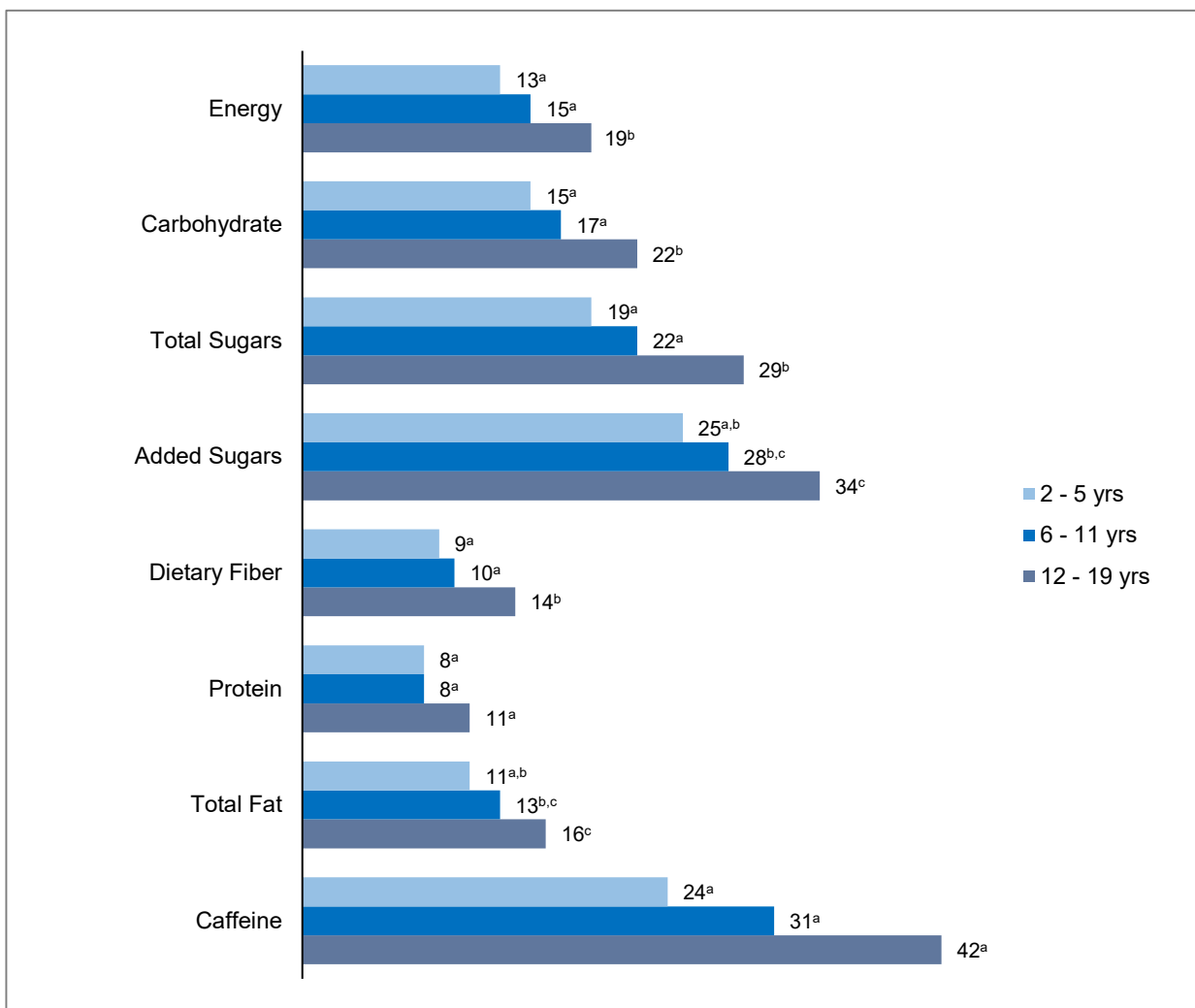
For convenience store reporters, what percentage of daily nutrients came from food/beverages obtained from convenience stores?

On the day consumed, food/beverages from convenience stores contributed 17% of total daily energy among all children. Food/beverages from convenience stores also provided 32% and 40% of the daily intake for added sugars and caffeine among all children (*data not shown*). Added sugars include sugars added during processing; total sugars include all sugars – both naturally occurring and added.

Adolescents (12-19 years) consumed a greater percentage of energy, carbohydrate, total sugars, and dietary fiber from convenience store food/beverages than children 2-5 years and 6-11 years.

Adolescents also consumed a greater percentage of added sugars and total fat from convenience store food/beverages than children 2-5 years.

Figure 3. Percentage of daily intake of energy and selected nutrients contributed by food/beverages from convenience stores among children who are convenience store reporters, 2015-2018



^{a,b,c} For each nutrient, percentages with different superscript letters are significantly different, p<0.01
 SOURCE: What We Eat in America, NHANES 2015-2018, day 1, individuals 2-19 years; FPED 2015-2018

What types of food and beverages from convenience stores did children consume?

The types of food and beverages obtained from convenience stores were similar across age groups. Sweetened beverages were the top food/beverage consumed representing 22% of food/beverages from a convenience store. The next most popular food/beverages were savory snacks such as potato chips, tortilla chips, popcorn and pretzels (15%) and candy (13%). Sweet bakery products such as cookies, brownies, and doughnuts represented 7% of food/beverages.

Milk and 100% juice each accounted for 6% to 8% of food/beverages for children 2-5 years; tea was popular with adolescents. Other categories represented less than 4% of convenience store food/beverages for any age group.

Table 1. Distribution (%) of selected food/beverages consumed from convenience stores, 2015-2018

WWEIA Food Category	Percentage of Food/Beverages			
	All Children	2 - 5 yrs	6 - 11 yrs	12 - 19 yrs
Sweetened Beverages	22%*	23%	24%	22%
Soft Drinks	12	9	13	13
Fruit Drinks	6	10	8	4
Sport and Energy Drinks	4	3	4	4
Nutritional Beverages & Smoothies/Grain Drinks	1	0	0	1
Savory Snacks	15	14	17	15
Potato chips	6	8	6	5
Tortilla, corn, other chips	7	5	9	7
Popcorn & Pretzels/Snack Mix	2	2	2	2
Candy	13	16	18	11
Sweet Bakery Products	7	5	9	6
Cookies and Brownies	3	3	3	3
Doughnuts, Sweet Rolls, Pastries	3	2	4	3
Cakes and Pies	0	0	1	0
Milk	4	8	2	4
Tea	3	2	2	4
100% Juice	2	6	1	1

* Numbers in smaller categories may not add to the larger category totals due to rounding.

SOURCE: What We Eat in America, NHANES 2015-2018, day 1, individuals 2 - 19 years; What We Eat in America Food Categories, 2015 - 2018

Definitions

Convenience Store: During the 24-hour dietary recall, respondents were asked the source (where obtained) for each food/beverage reported. Items reported with the source of “Store – convenience type” include but are not limited to: convenience-type store, dollar store, drug store, gas station, gift shop, liquor/beer store.

Convenience Store Reporter: A child who consumed at least one food and/or beverage (excluding plain bottled water), in any amount, from a convenience store at least once on the intake day.

Eating Occasion: A distinct eating/drinking occurrence reported during the 24-hour dietary interview that consists of one or more food/beverage items. The name of the eating occasion was selected from a fixed list provided during the interview. English and Spanish eating occasion names were grouped as follows:

Breakfast: breakfast, desayuno, and almuerzo

Lunch: brunch, lunch, and comida

Dinner: dinner, supper, and cena

Snack: snack, drink, extended consumption (items consumed over a long period of time), merienda, entre comidas, botana, bocadillo, tentempie, and bebida (excluding plain water)

Data Sources

Estimates in this report are based on one day of dietary intake data collected in *What We Eat in America* (WWEIA), the dietary interview component of the National Health and Nutrition Examination Survey (NHANES), in 2015-2018 (4). Dietary intake of food and beverages were obtained from an in-person 24-hour recall, collected using the interviewer-administered 5-step USDA Automated Multiple-Pass Method. The study sample included 5,281 individuals (2,636 males and 2,645 females), 2-19 years, with complete and reliable intakes; distribution by age group was 2-5 years (1,205), 6-11 years (1,835), and 12-19 years (2,241). Sample weights were applied in all analyses to produce nationally representative estimates. Intakes of energy and nutrients were calculated using the 2015-2016 and 2017-2018 versions of USDA’s Food and Nutrient Database for Dietary Studies (5) and Food Patterns Equivalents Database (6). The WWEIA Food Categories were used to define types of food and beverages (7).

References

1. Volpe, Richard, Annemarie Kuhns, and Ted Jaenicke. 2017. Store Formats and Patterns in Household Grocery Purchases, EIB-167, U.S. Department of Agriculture, Economic Research Service. <https://www.ers.usda.gov/webdocs/publications/82929/eib-167.pdf?v=1193.5>. Accessed September 9, 2021.
2. NACS State of the Industry 2019. <https://www.convenience.org/getattachment/Media/Press-Releases/2020/Convenience-Retail-Industry-Pivots-for-Long-Term-C/2019-SOI-Numbers-Infographic.pdf?lang=en-US>. Accessed September 9, 2021.
3. CSP. NACS State of the Industry Summit 2015. [0ec40c17dc5ad5f655780a772a47ec2a9641caf5.4.pdf \(coverstand.com\)](https://www.coverstand.com/0ec40c17dc5ad5f655780a772a47ec2a9641caf5.4.pdf). Accessed September 9, 2021.
4. Centers for Disease Control and Prevention, National Center for Health Statistics. *NHANES Questionnaires, Datasets, and Related Documentation*. <https://wwwn.cdc.gov/nchs/nhanes/>. Accessed September 9, 2021.
5. USDA Food Surveys Research Group. *FNDDS Documentation and Databases*. <https://www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/food-surveys-research-group/docs/fndds-download-databases/>. Updated January 2021.
6. USDA Food Surveys Research Group. *FPED Databases and SAS Data Sets*. <https://www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/food-surveys-research-group/docs/fped-databases/>. Updated May 2021.
7. USDA Food Surveys Research Group. *Dietary Methods Research. WWEIA Food Categories*. <https://www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/food-surveys-research-group/docs/dmr-food-categories/>. Updated January 2021.

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