



Food Surveys Research Group
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Dinner consumption by U.S. children and adolescents

What We Eat in America, NHANES 2017-March 2020

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Highlights

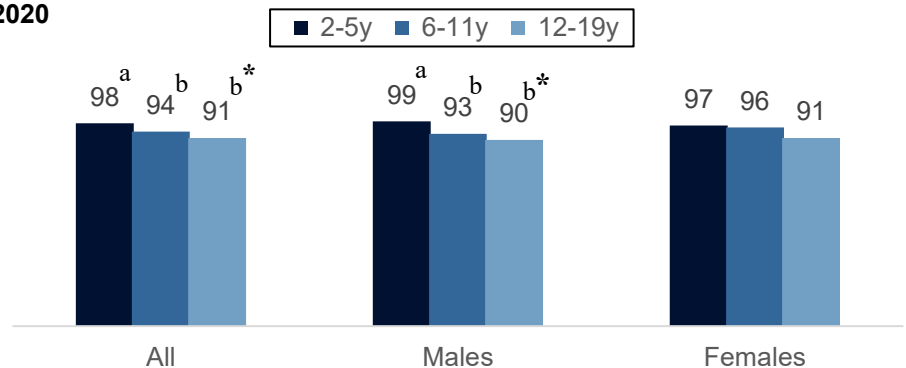
- ▶ Overall, 93% of children and adolescents have dinner on any given day.
- ▶ Dinner consumption declines as children age.
- ▶ Non-Hispanic White children and adolescents are more likely to consume dinner compared to Non-Hispanic Blacks and Hispanics.
- ▶ There are no differences in the prevalence of dinner consumption by family income level.
- ▶ Dinner consumers have higher total intakes of most nutrients compared to non-reporters.
- ▶ Dinner contributes about one-quarter to one-third to intake of most nutrients by consumers.
- ▶ Mixed dishes, including sandwiches and grain-based dishes, are the most frequently consumed foods at dinner.
- ▶ Except for water, sweetened beverages are the most frequently reported beverages by children and adolescents at dinner.

Dinner is usually consumed in the evening and is the daily meal that families most often have together (1). The frequency of family meals (2, 3), foods prepared at home (4, 5) and the family food environment (6) are associated with better nutrient intake and diet quality among children and adolescents. However, busy and conflicting schedules among family members may result in reliance on take away and packaged foods (7), which are associated with less healthful dietary intake (8, 9). There is little information about dinner consumption and its contribution to dietary intake of children and adolescents. Therefore, this data brief reports food and nutrient intake of dinner consumers and non-consumers among children and adolescents using nationally representative data from What We Eat in America, NHANES 2017-March 2020.

Who consumes dinner?

Overall, 93% of children and adolescents consume dinner on any given day (*data not shown*). Male and female adolescents 12-19 years had dinner less frequently than all those 2-5 but not 6-11 years. Similar differences were observed among males, except among those 6-11 years who were similar to those 12-19 years. There were no differences among females. Prevalence of dinner consumption does not differ between males and females overall or by age (*data not shown*).

Figure 1. Prevalence (%) of dinner¹ consumption among children and adolescents 2-19 years by gender and age, WWEIA, NHANES 2017- March 2020



¹See definition of "dinner", page 8.

^{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.

* For all children and adolescents and by gender, significant inverse relationship between dinner consumption and age, $p < 0.001$

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



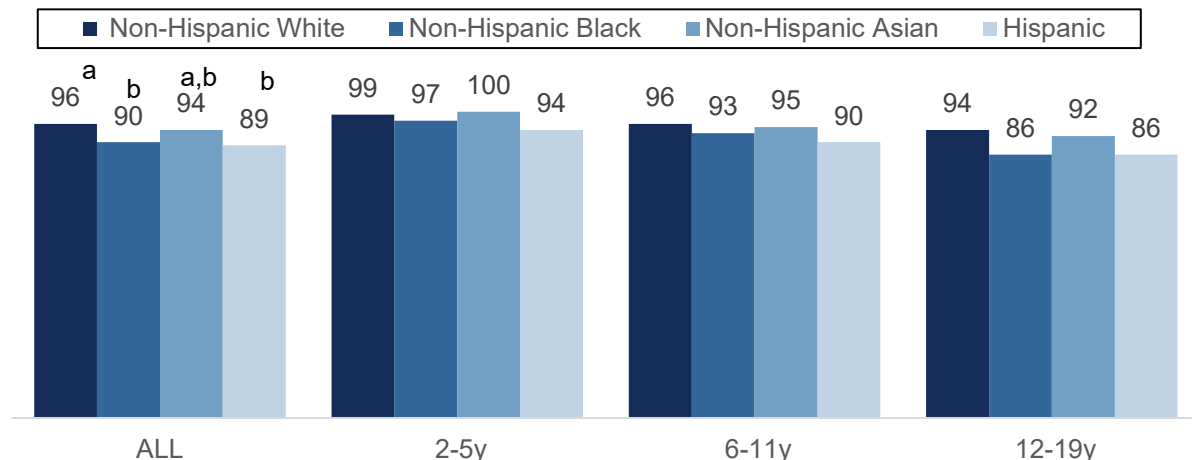
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Does the prevalence of dinner consumption differ by race/ethnicity or family income?

As shown in Figure 2, among all individuals 2-19 years, Non-Hispanic White children and adolescents are more likely to consume dinner than Non-Hispanic Blacks and Hispanics. Prevalence of dinner consumption among Non-Hispanic Asians does not differ from any other race/ethnic group.

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

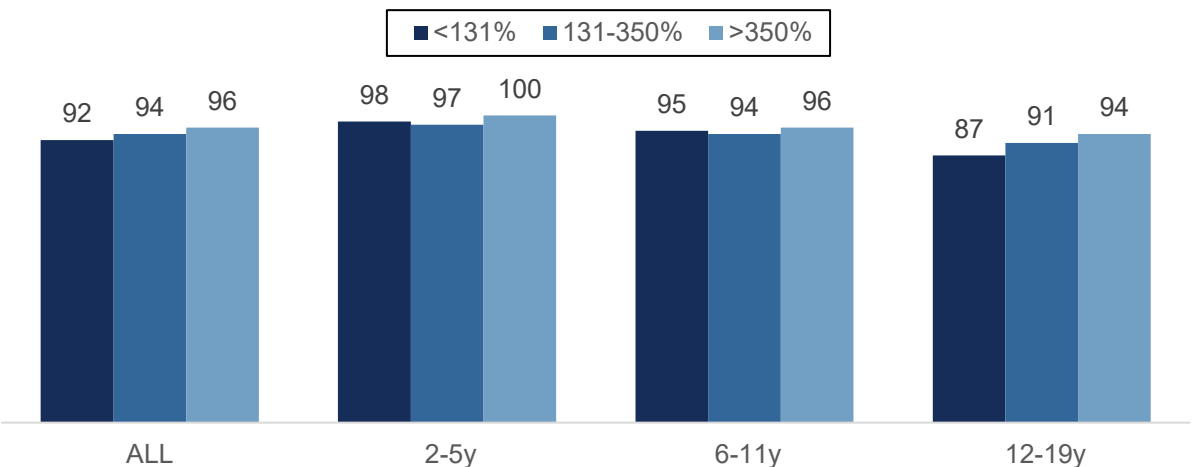


^{a,b} Within age, percentages with different superscripts differ significantly by race/ethnicity, $P < 0.001$

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

There are no differences in prevalence of dinner consumption by family income level among children and adolescents overall or by age (Figure 3). Prevalence of dinner consumption among males overall or by age does not differ by family income level (*data not shown*). Among all females, there are no differences in prevalence by income level. However, females 12-19 years at the lowest income level consume dinner less frequently (86%) than those at the highest level (97%) (*data not shown*).

Figure 3. Prevalence (%) of dinner consumption among children and adolescents 2-19 years by age and family income as percent of poverty level¹, WWEIA, NHANES 2017 – March 2020



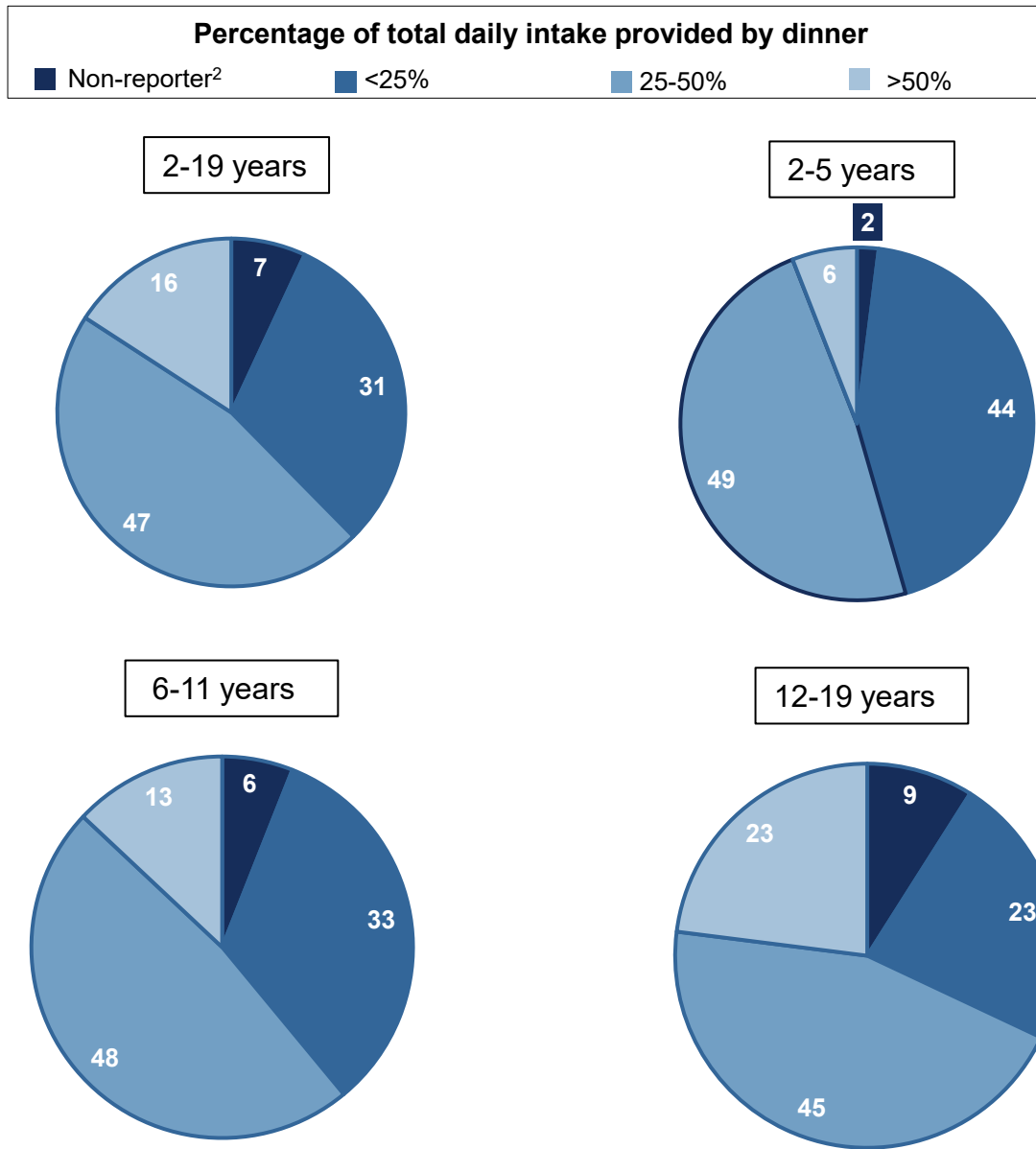
¹ Ratio of family income to poverty expressed as a percentage (see definitions, p.9)

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

What percentage of total daily energy is consumed at dinner?

As Figure 4 illustrates, missing dinner is more frequent as age increases. Dinner provides 25-50% of total daily energy intake for almost half of children and adolescents overall. However, it is more likely to provide a higher percentage of reporters' daily energy intake among adolescents; less than 10% of those 2-5 years obtain more than half their daily energy intake at dinner whereas almost one-quarter of those 12-19 years do.

Figure 4. Percentage¹ of individuals by level of total daily energy intake from dinner, children and adolescents 2-19 years, WWEIA, 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 dinner consumers and non-consumers?

Table 1 shows energy and nutrient intake of dinner consumers and non-consumers by age. Energy intake is higher among consumers compared to non-consumers within each age group. For most macronutrients and micronutrients (i.e., vitamins and minerals), intakes are higher among consumers versus non-consumers in at least one of the three age groups. The only micronutrient for which there are no significant differences in any age group is Vitamin C.

Table 1. Mean daily intake of energy and selected nutrients by dinner consumption status¹, children and adolescents 2-19 years, WWEIA, NHANES 2017 – March 2020.

Energy/Nutrient	2-5 years		6-11 years		12-19 years	
	C	NC [†]	C	NC	C	NC
Energy (kcal) ²	1555*	989	1963*	1680	2104*	1616
Macronutrients and food components						
Protein (g)	54*	34	66*	52	77*	53
Carbohydrate (g)	207	145	255*	226	259	211
Added sugars (tsp eq)	12	10	17	17	19	17
Dietary fiber (g)	12	10	15*	11	15*	11
Total fat (g)	59*	33	78*	66	86*	64
Saturated fat (g)	21	12	27	24	29*	23
Vitamins						
Vitamin A (mcg RAE)	551	379	605	477	555*	417
Vitamin B12 (mcg)	4*	2	4	4	5	4
Vitamin C (mg)	86	85	74	64	64	59
Vitamin D (mcg)	5*	4	5	5	4	4
Folate (mcg DFE)	370	272	493	394	511*	355
Minerals						
Calcium (mg)	960*	617	1016	917	986*	767
Iron (mg)	10*	7	14	12	14*	10
Potassium (mg)	1998*	1461	2094	1795	2182*	1767
Sodium (mg)	2193*	1252	2965*	2230	3476*	2387

[†] 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.

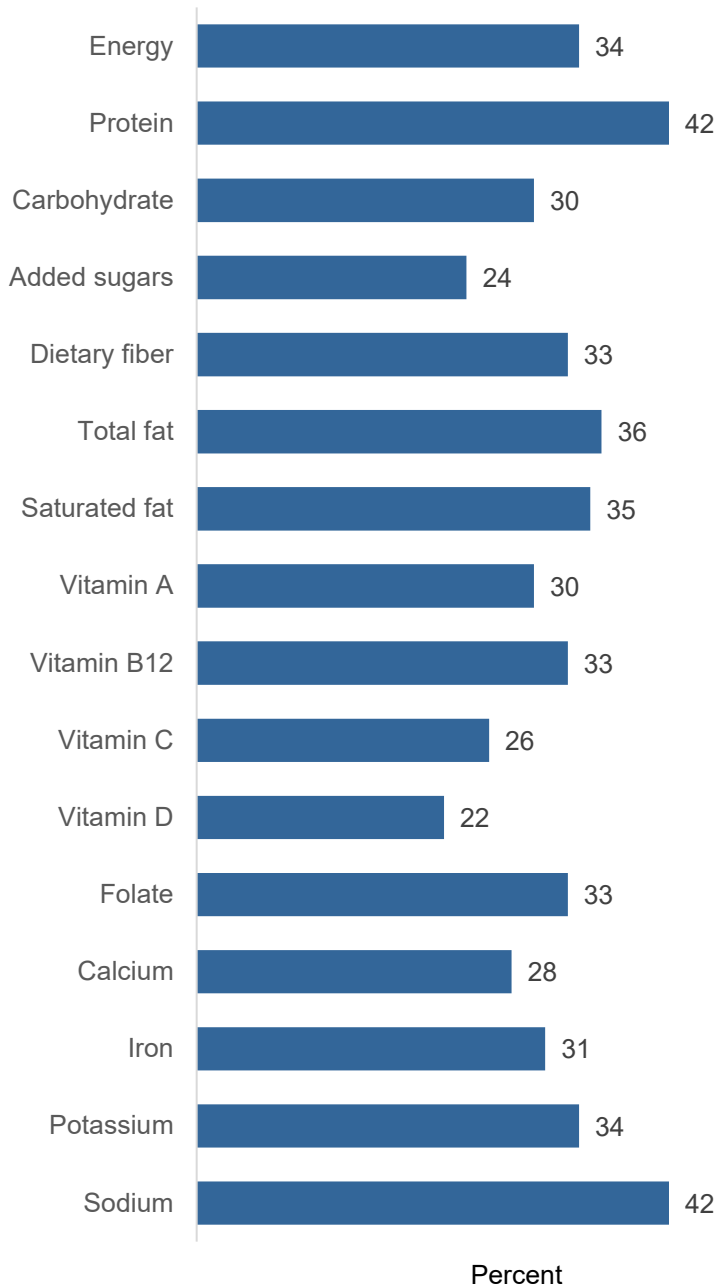
* Difference within age group between consumers and non-consumers is significant, $P < 0.001$.

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

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

The contribution of dinner to reporters' daily energy and nutrient intake is shown in Figure 5. Just over one-third of total energy intake is consumed at dinner. For most nutrients, dinner provides around one-quarter to one-third of total intake.

Figure 5. Contribution (%) of lunch to total daily intakes of energy and selected nutrients of dinner consumers¹, 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 dinner?

As shown in Table 2, the most frequently consumed foods at dinner are mixed dishes, which are reported by about two-thirds of children and adolescents. Mixed dishes also contribute the most to energy intake of those consuming them. Some commonly consumed mixed dishes at dinner include sandwiches, grain-based mixed dishes such as pasta and rice dishes, and pizza. Protein foods are consumed by about one-third of children and adolescents, particularly poultry items. Almost one-third have vegetables at dinner, and about one half of vegetable reporters have white Potatoes, which includes French fries.

Table 2. Foods frequently consumed at dinner: 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
Mixed Dishes	66	487
Sandwiches ³	18	469
Grain-based Mixed Dishes	17	383
Pizza	13	543
Mexican Mixed Dishes	9	570
Meat, Poultry, Seafood Mixed Dishes	7	394
Protein Foods	34	296
Poultry	20	314
Chicken, whole pieces	12	328
Chicken patties, nuggets, tenders	7	300
Meats	7	254
Vegetables	31	175
Vegetables, excluding potatoes	19	101
Lettuce and lettuce-based salads	3	195
White potatoes	16	221
French fries and other fried potatoes	11	224
Grains	21	251
Bread, rolls, tortillas	9	190
Rice	7	195
Snacks and Sweets	20	233
Sweet Bakery Products	8	269
Savory Snacks	6	180
Fruit	8	70

¹ See “WWEIA Food Categories” in definitions, page 8

² kcal: kilocalories (see definitions, page 8)

³ Includes ingredients that may typically be added such as ketchup, mustard or mayonnaise to sandwiches and burgers, salad dressing to salads, ketchup to French fries.

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

What beverages are consumed at dinner?

Beverages are consumed at dinner by 76% of consumers. As shown in Table 3, water is consumed by almost half of beverage consumers and is the most frequently reported, followed by sweetened beverages. Other beverages such as milk, 100% juice and flavored milk are each reported by less than 10% of dinner consumers. When consumed, the highest contributors to energy intake from beverages are dairy drinks and substitutes, and flavored milk, though these are the most infrequently reported.

Table 3. Beverages frequently consumed at dinner: 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
Beverages	76	82
Water	34	0
Plain water (bottled and tap)	33	0
Sweetened Beverages ²	26	127
Milk	8	131
100% juice	5	101
Tea ³	5	119
Flavored Milk	2	190
Dairy Drinks and Substitutes	1	237

¹ See “WWEIA Food Categories” in definitions, page 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 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”.

Dinner: meal occasions designated by the respondent as "dinner", "supper", or the Spanish equivalent "cena". The timing of an eating occasion has no implication as to the type of meal. An eating occasion reported during typical dinner hours (i.e. evening) is not considered to be dinner unless the respondent specified it as such.

Consumer/non-consumer: In general, anyone who reported any dinner occasion (*see definition above*) was considered a “consumer,” whereas anyone who did not was considered a “non-consumer.” By age, the number of dinner consumers (C) and non-consumer (NC) were: 2-5y: C=915, NC=25; 6-11y: C=1311, NC=100; 12-19y: C=1541, NC=199. Classification as a consumer or non-consumer for this analysis has no implications as to habitual consumption.

Family income (as percentage of the poverty level): the ratio of family income to poverty expressed as a percentage. The Department of Health and Human Services’ poverty guidelines were used as the poverty measure to calculate the ratio (10).

WWEIA Food Categories: Available at www.ars.usda.gov/Services/docs.htm?docid=23429 is a full list of the WWEIA Food Categories (11), 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 lettuce salad represented in the dietary data as iceberg lettuce, tomatoes, cucumbers, carrots, and ranch dressing would be assigned to the “lettuce and lettuce salads” group, along with similar salads that were not represented by multiple items, i.e., single-code salads that are categorized in the WWEIA Food Category “lettuce and lettuce salads.” Similarly, if milk and/or sugar were 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 8. 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”.

Data source

Estimates in this report are based on one day of dietary intake data collected in What We Eat in America (WWEIA), the dietary intake interview component of the National Health and Nutrition Examination Survey (NHANES) 2017-March 2020 Prepandemic (12). Using the 5-step USDA Automated Multiple-Pass Method (AMPM) for the 24-hour recall, day 1 dietary data were collected in-person. A total of 4,091 individuals 2-19 years (2,068 males and 2,023 females) who provided complete and reliable dietary intake data in 2017-March 2020 and met study criteria were included. Those whose race/ethnicity was classified as “Other” (N=385) were not included in the analysis for race/ethnicity only (p2). In the analysis by family income (p3), there were 413 participants not included in the analysis because there was no information about income. Sample weights were applied in all analyses to produce nationally representative estimates. USDA’s What We Eat in America Food Categories (11) were used to describe food intake. 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 (13). Comparisons were made using t-tests. Results were considered significantly different at $P < 0.001$.

References

1. FMI Foundation Power of Family Meals, The Hartman Group 2017. Desires< barriers and Directions for Shared Meals at Home. Available at: www.fmi.org/docs/default-source/familymeals/fim-power-of-family-meals-whitepaper-for-web.pdf?sfvrsn=13d87f6e_2> Accessed: 05/03/2023.
2. Dallacker M, Hertwig R, Mata J. The frequency of family meals and nutritional health in children: a meta-analysis. *Obesity Reviews* 2018;19(5):638-653.
3. Metcalfe JJ, Friese BH, STRONG kids 1 Research Team. Family food involvement is related to healthier dietary intake in preschool-aged children. *Appetite* 2018; 126:195-200.
4. Overcash F, Davey C, Zhang Y, Reicks M. Evening meal types and family meal characteristics: associations with demographic characteristics and food intake among adolescents. *Nutrients* 2020; 12(4):886. doi: 10.3390/nu/12040886.
5. Hammons AJ, Fiese BH. Is frequency of shared family meals related to the nutritional health of children and adolescents? *Pediatrics* 2011; 127(6):e1656-74.
6. Scaglioni S, De Cosmi V, Ciappolina V, Parazzini F. Factors influencing children's eating behaviours. *Nutrients* 2018; 10 (6):706. doi: 10.3390/nu/10060706.
7. Ballard J. Most parents wish they were having family dinners more often. YouGovAmerica, November 2019. Available at: <https://today.yougov.com/topics/society/articles-reports/2019/11/12/family-dinner-poll-survey>. Accessed 05/03/2023.
8. Demissie, , Eaton DK, Lowry R, Kim SA, Park S, Grimm KA, Merlo C, Harris DM. The association of meal practices and other dietary correlates with dietary intake among high school students in the United States, 2010. *Am J Health Promot* 2015; 29(6):e203-13.
9. Golper S, Nagao-Sato S. Overcash F, Reicks M. Frequency of meals prepared away from home and nutrient intakes among US adolescents (NHANES 2011-2018). *Nutrients* 2021; 13(11):4019. doi: 10.3390/nu13114019.
10. 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.
11. 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.
12. 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.
13. USDA Food Surveys Research Group. *FNDDS Documentation and Databases*. www.ars.usda.gov/fsrg/fndds/download. Accessed March 6, 2023.

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