



Food Surveys Research Group
Dietary Data Brief No. 57
April 2024

Lunch Consumption by U.S. Adults

What We Eat in America, NHANES 2017 - March 2020

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Highlights

- ▶ Overall, 77% of adults report lunch on the intake day, with no differences by gender and age.
- ▶ A higher percentage of non-Hispanic (NH) White and NH Asian adults consume lunch relative to NH Black and Hispanic adults.
- ▶ Prevalence of lunch is higher among adults with family incomes >350% of the poverty level relative to those with lower family incomes.
- ▶ Nine percent of adults obtain more than half of their daily intake of energy from lunch.
- ▶ Compared to non-consumers, lunch consumers have higher intakes of energy and all nutrients examined.
- ▶ Among consumers, lunch accounts an average of 29% of daily intakes of energy and 22-35% of nutrient intake.
- ▶ The food group most commonly consumed at lunch is mixed dishes, which includes sandwiches, and the most commonly consumed beverage is water.

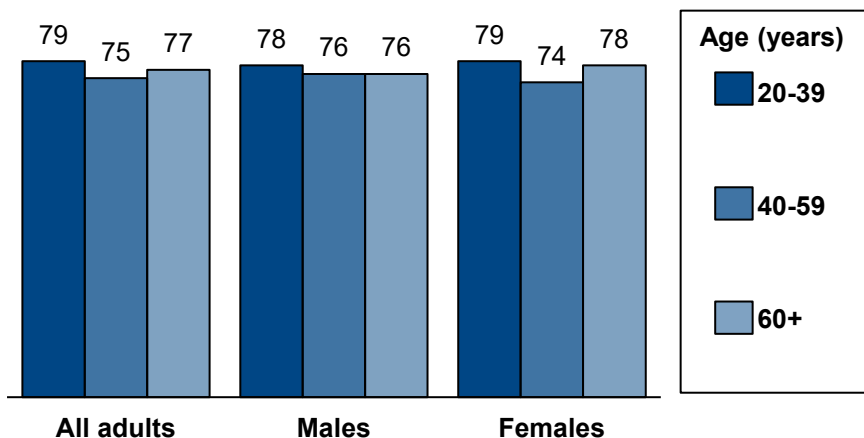
Lunch is a midday meal consumed in the U.S. and worldwide (1, 2). Foods and beverages at lunch have been shown to contribute substantially to dietary intake of adults (3). Moreover, the lunch meal offers an avenue to boost nutrient intakes among older adults, a group at risk for inadequate nutrition (4). However, comprehensive, up-to-date information concerning lunch is lacking. The purpose of this report is to describe lunch consumption by the U.S. adult population. (See page 8 for a definition of “lunch”.) This analysis is based on one day of dietary intake data from What We Eat in America (WWEIA), National Health and Nutrition Examination Survey (NHANES) 2017- March 2020. It is one of four Dietary Data Briefs reporting information by meal type (breakfast, lunch, dinner, snack) for adults.

Who consumes lunch?

On any given day, 77% of all adults aged 20 years and older consume one or more foods and/or beverages at lunch.

The prevalence of lunch consumption does not vary among males and females (77% for each; *data not shown*). In addition, no differences by age are seen among all adults or by gender (Figure 1).

Figure 1. Prevalence (%) of lunch¹ consumption among adults age 20 + years, by gender and age, WWEIA, NHANES 2017 - March 2020



SOURCE: WWEIA, NHANES 2017 - March 2020, day 1, adults 20 years of age and older.



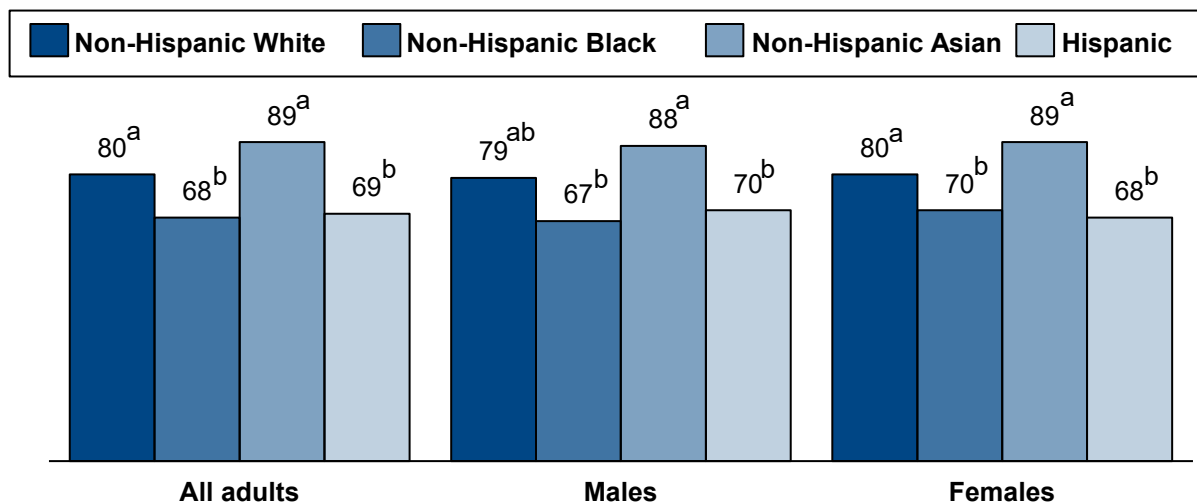
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Does the prevalence of lunch consumption differ by race/ethnicity or family income?

Overall, non-Hispanic (NH) White and NH Asian adults are more likely to consume lunch than NH Black and Hispanic adults (Figure 2). This same pattern is observed among females. The prevalence of lunch consumption is higher among NH Asian males relative to NH Black and Hispanic males, but that of NH White males is not statistically different from any of the other race/ethnic groups.

Figure 2. Prevalence (%) of lunch consumption among adults age 20+ years, by gender and race/ethnicity, WWEIA, NHANES 2017- March 2020

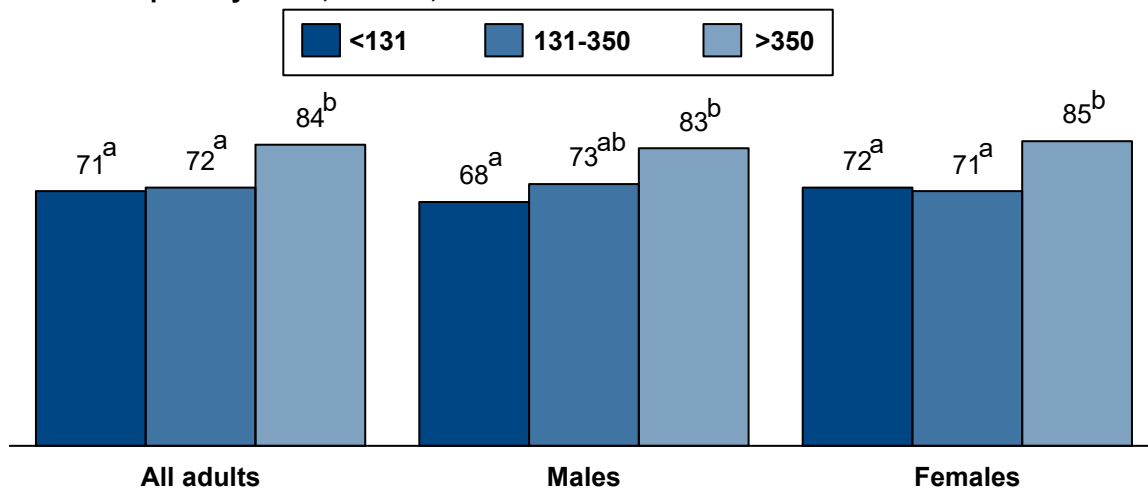


^{a,b}For all adults and by gender, percentage estimates with different superscripts differ by race/ethnicity ($p < 0.001$) based on a two-tailed *t*-test.

SOURCE: WWEIA, NHANES 2017 - March 2020, day 1, adults 20 years of age and older.

Adults in the highest category of family income are more likely to consume lunch than adults in either the lowest or middle category (Figure 3). Results by gender reflect those among all adults, except that the greater prevalence of lunch consumption of those in the highest as compared to the middle income category is seen among females only.

Figure 3. Prevalence (%) of lunch consumption among adults age 20+ years, by gender and family income as % of poverty level¹, WWEIA, NHANES 2017- March 2020



^{a,b}For all adults and by gender, estimates with different superscripts differ significantly by family income ($p < 0.001$) based on a two-tailed *t*-test.

¹Ratio of family income to the federal poverty guidelines expressed as a percentage. See definition of “family income” on page 8.

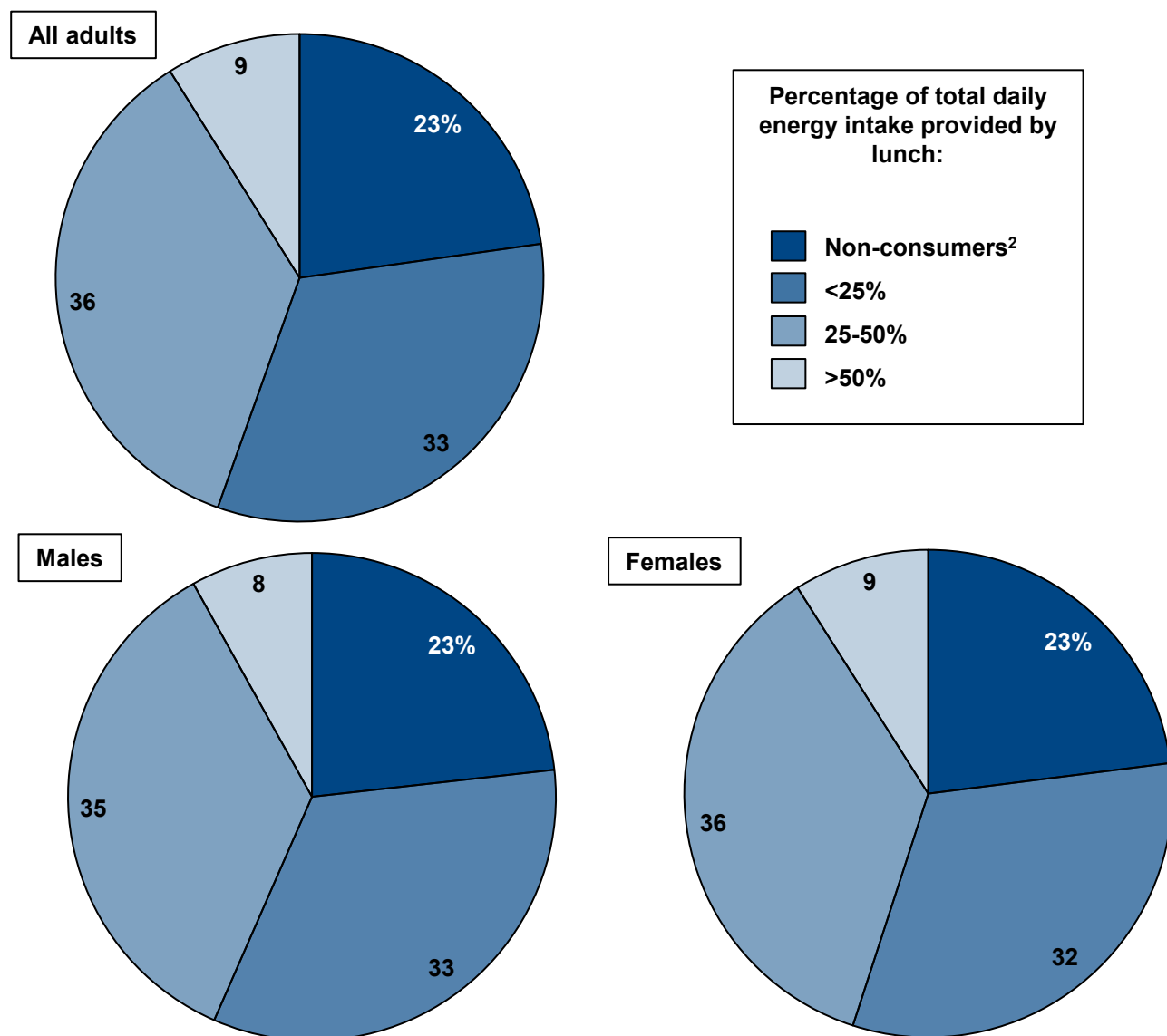
SOURCE: WWEIA, NHANES 2017 - March 2020, day 1, adults 20 years of age and older.

What percentage of total daily energy is consumed at lunch?

Lunch foods and beverages account for 23% of total daily energy intake by U.S. adults overall (*data not shown*).

Energy intake from lunch as a percentage of total daily intake categorized into levels is shown in Figure 4. Approximately one-third of adults are lunch consumers obtain less than 25% or their total daily intake from this meal, and about one-third obtain between 25 and 50%. Nearly one in ten adults obtain more than half of their daily energy from lunch. Findings by gender reflect those for all adults.

Figure 4. Percentage¹ of individuals by level of total daily energy intake from lunch, adults age 20+ years, by gender, 2017 – March 2020



¹Estimates may not sum to 100 due to rounding.

²See definition of “consumer/non-consumer” on page 8.

SOURCE: WWEIA, NHANES 2017 - March 2020, day 1, adults 20 years of age and older.

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

Adults who consume lunch have higher intakes of energy and all macronutrients/food components analyzed except added sugars (Table 1). On average, approximately 300 more kilocalories are ingested by lunch consumers as compared to non-consumers. Higher intake of foods and beverages likely also plays a role in consumers' higher daily intakes of all vitamins, and minerals shown. In general, findings by gender mirror those for all adults together.

Table 1. Mean daily intake of energy and selected nutrients by lunch consumption¹ status among adults age 20+ years, by gender, 2017 – March 2020

Energy/Nutrient	All adults		Males		Females	
	C	NC	C	NC	C	NC
Energy (kcal) ²	2216*	1902	2566*	2208	1892*	1617
Macronutrients/food components:						
Protein (g)	85*	68	99*	79	72*	58
Carbohydrate (g)	250*	223	287	256	217*	192
Added sugars (tsp eq)	17	17	19	20	14	14
Dietary fiber (g)	17*	14	19*	15	16*	13
Total fat (g)	92*	76	106*	86	79*	66
Saturated fat (g)	30*	25	34*	28	26*	22
Vitamins:						
Vitamin A (mcg RAE)	669*	497	704*	517	636*	479
Vitamin B12 (mcg)	5*	4	6*	5	4	3
Vitamin C (mg)	81*	65	85	69	77*	61
Vitamin D (mcg)	4*	4	5	4	4*	3
Folate (mcg DFE)	503*	412	576*	475	435*	353
Minerals:						
Calcium (mg)	988*	802	1111*	874	874*	735
Iron (mg)	14*	12	17*	14	12*	10
Potassium (mg)	2711*	2211	3016*	2511	2427*	1931
Sodium (mg)	3642*	2863	4229*	3319	3098*	2439

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.

¹See definition of "consumer/non-consumer" on page 8.

²See definition of "kilocalorie" on page 8.

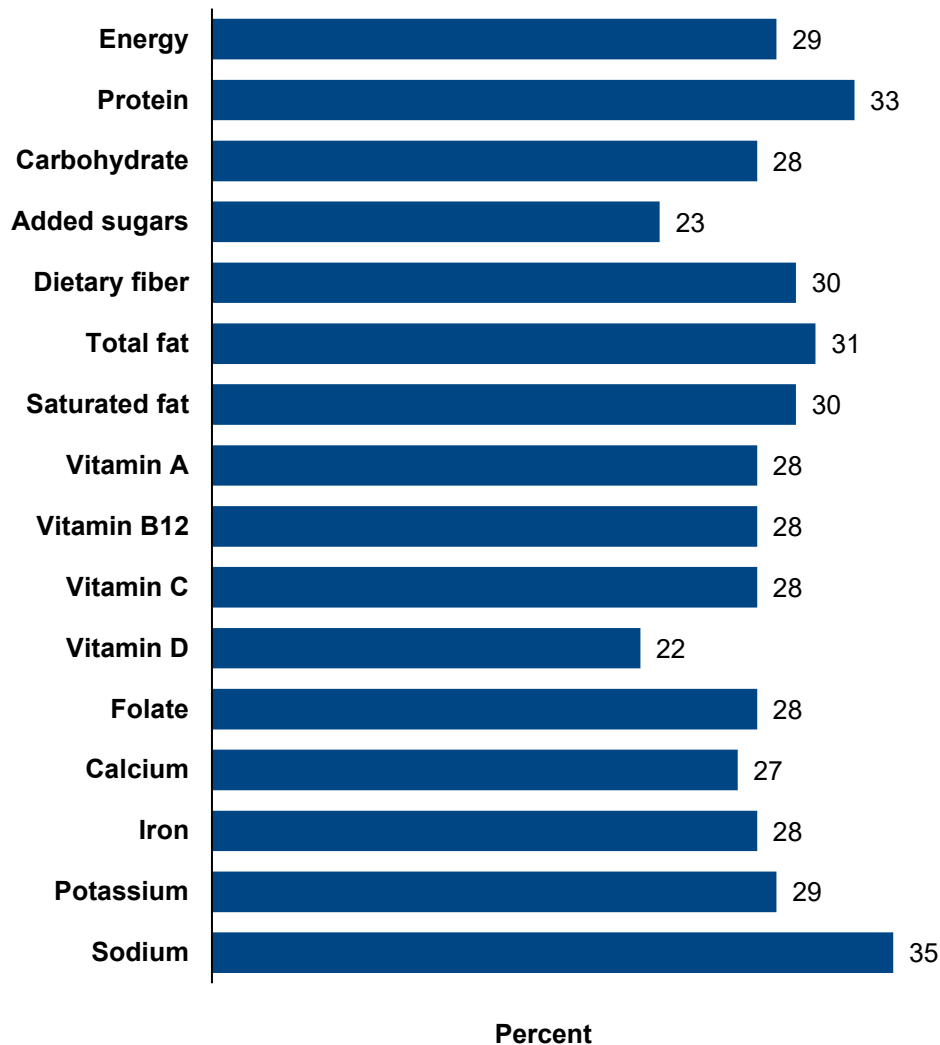
*Intake is significantly higher for adult consumers than for non-consumers ($p < 0.001$) based on a two-tailed t-test.

SOURCE: WWEIA, NHANES 2017 - March 2020, day 1, adults 20 years of age and older.

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

The contribution of lunch to consumers’ intake of most nutrients is broadly in line with the meal’s energy contribution (Figure 5). This finding is also true among male and female lunch consumers analyzed separately (*data not shown*). However, the percentage of daily intake of a few nutrients/food components are somewhat disparate from lunch’s mean energy contribution. The percentage of daily intake of added sugars and Vitamin D from lunch are on average 6+ percentage points lower than the meal’s mean energy contribution, whereas the percentage of protein and sodium are 4+ percentage points higher.

Figure 5. Contributions of lunch to total daily intakes of energy and selected nutrients/food components, adults age 20+ years, consumers¹ only, 2017 – March 2020



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

SOURCE: WWEIA, NHANES 2017 - March 2020, day 1, adults 20 years of age and older.

What foods are consumed at lunch?

Table 2 displays foods frequently consumed at lunch. By far, mixed dishes are the most highly consumed. Two-thirds of adult lunch consumers have one or more mixed dishes at this meal on the intake day, and half of those individuals consume a sandwich. Mixed dishes also contributed the largest average energy contribution among those who consumed them.

Table 2. Foods frequently consumed at lunch: Percentage of adults consuming and mean energy contribution when consumed, adults age 20+ years, 2017 – March 2020

WWEIA Food Category	Consumers (%)	Mean energy contribution per consumer of a food from that WWEIA food category (kcal) ¹
Mixed dishes	66	502
Sandwiches	33	470
Burgers	6	527
Deli and cured meat sandwiches	12	411
Meat, poultry, seafood mixed dishes	8	393
Grain-based mixed dishes	8	444
Soups	8	245
Mexican mixed dishes	6	697
Pizza	4	670
Vegetables	28	234
Lettuce and lettuce salads	7	223
French fries and other fried potatoes	7	270
Snacks and sweets	24	228
Savory snacks	12	192
Sweet bakery products	6	292
Protein foods	22	338
Chicken	8	368
Meats	4	283
Grains	14	273
Bread, rolls, tortillas	7	212
Fruit	10	105
Dairy, excluding milk beverages²	4	169

¹Kcal, kilocalories. See Definitions on page 8.

²See “WWEIA Food Categories” in the Definitions on page 8 for an explanation of this food group.

SOURCE: WWEIA, NHANES 2017 - March 2020, day 1, adults 20 years of age and older.

What beverages are consumed at lunch?

Sixty-eight percent of adults who consume lunch include a non-alcoholic beverage with their meal (Table 3). Water is consumed at lunch by about one-third of adult reporters.

Sweetened beverages contain added sugars, accounting for nearly all their energy content. However, plain tea and coffee contain no calories. Milk and sugar added to coffee and tea result in these beverages contributing meaningful amounts of energy to intakes of adults who consume them at lunch.

Among all adults who consume lunch, non-alcoholic beverages contribute 58 calories, or 9% of lunch energy (*data not shown*).

Table 3. Beverages frequently consumed at lunch: Percentage of adults consuming and mean energy contribution when consumed, adults 20+ years, 2017 – March 2020

WWEIA Food Category	Consumers (%)	Mean energy contribution per consumer of a beverage from that WWEIA food category (kcal) ¹
Beverages (nonalcoholic)²	68	85
Water	32	4
Sweetened beverages	18	183
Tea	10	87
Coffee	5	65
100% juice	2	161
Milk, plain	2	189
Beverages (alcoholic)	3	265

¹Kcal, kilocalories. See Definitions on page 8.

²See “WWEIA Food Categories” in the Definitions on page 8 for an explanation of this food group.

SOURCE: WWEIA, NHANES 2017 - March 2020, day 1, adults 20 years of age and older.

Definitions

Kilocalories: Scientific unit used in reporting the energy content of food; shortened to “calories” in casual usage in the U.S.

Lunch: meal occasions designated by the respondent as “brunch”, “lunch” or the Spanish equivalent “comida”. The time an eating occasion occurs has no implication as to the type of meal. An eating occasion reported during typical lunch hours (i.e., midday) is not considered to be lunch unless the respondent specified it as such.

Consumer/non-consumer: In general, anyone who reported lunch (*see definition above*) was considered a “consumer,” whereas anyone who did not was considered a “non-consumer.” In all, 5,625 adults were classified as lunch consumers (2,701 males and 2,924 females), and 2,082 were classified as non-consumers (1,044 males and 1,038 females). 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 expressed as a percentage. The Department of Health and Human Services’ poverty guidelines were used as the poverty measure to calculate the ratio (5).

WWEIA Food Categories: Available at www.ars.usda.gov/Services/docs.htm?docid=23429 is a full list of the WWEIA Food Categories, 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 of the linked items were classified together into the most appropriate WWEIA Food Category. For example, a ham and cheese sandwich represented in the dietary data as white bread, deli ham, American cheese, and mayonnaise would be assigned to the “deli and cured meat 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) – deli and cured meat sandwiches.” Similarly, if creamer was 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 included under “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 6 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 (6). 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 7,707 individuals 20 years of age and older (3,745 males and 3,962 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 (368 adults, of whom 264 were lunch consumers) were excluded. Likewise, in the income-specific analyses (also on page 2), individuals with missing family income information (971 adults, of whom 688 were lunch consumers) 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 (7). Intake of added sugars was calculated using the Food Patterns Equivalents Database for Use with WWEIA, NHANES 2017-March 2020 Prepandemic (8).

References

1. U.S. Department of Agriculture, Agricultural Research Service. *Lunch: Percentages of selected nutrients contributed by foods and beverages consumed at lunch, by gender and age, What We Eat in America, NHANES 2017-March 2020 Prepandemic*. <https://www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/food-surveys-research-group/docs/wweia-data-tables/>. Accessed July 27, 2023.
2. Huseinovic E, Winkvist A, Slimani N, et al. Meal patterns across ten European countries – results from the European Prospective Investigation into Cancer and Nutrition (EPIC) calibration study. *Public Health Nutr.* 2016 Oct;19(15):2769-2780. doi: 10.1017/S1368980016001142
3. Krok-Schoen JL, Jonnalagadda SS, Luo M, Kelly OJ, Taylor CA. Nutrient intakes from meals and snacks differ with age in middle-aged and older Americans. *Nutrients.* 2019;11(6):1301. Published 2019 Jun 8. doi:10.3390/nu11061301
4. Verreijen AM, van den Helder J, Streppel MT, et al. A higher protein intake at breakfast and lunch is associated with a higher total daily protein intake in older adults: a post-hoc cross-sectional analysis of four randomized controlled trials. *J Hum Nutr Diet.* 2021;34(2):384-394. doi:10.1111/jhn.12838 .
5. 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 May 10, 2023.
6. Centers for Disease Control and Prevention, National Center for Health Statistics. *NHANES Questionnaires, Datasets, and Related Documentation*. <https://wwwn.cdc.gov/nchs/nhanes/>. Accessed August 15, 2023.
7. USDA Food Surveys Research Group. *FNDDS Documentation and Databases*. www.ars.usda.gov/fsrg/fndds/download. Accessed September 27, 2023.
8. 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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Suggested citation

Sebastian RS, Hoy MK, Murayi T, Goldman JD, Moshfegh AJ. *Lunch Consumption by U.S. Adults: What We Eat in America, NHANES 2017-March 2020*. Food Surveys Research Group Dietary Data Brief No. 57. April 2024.

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