



Protein Consumption Among Youth and Adults: United States, August 2021–August 2023

Catharine A. Couch, Ph.D., R.D., Nicholas Ansai, M.P.H., Adi Noiman, Ph.D., and Cynthia L. Ogden Ph.D.

Key findings

Data from the National Health and Nutrition Examination Survey

- During August 2021–August 2023, youth consumed 13.9% of total calories from protein on a given day, and consumption was higher among adolescents ages 12–19 (14.3%) than children ages 6–11 (13.3%).
- Overall, adults consumed 15.5% of total calories from protein, and consumption was lower among adults age 60 and older (15.1%) than adults ages 20–39 (15.6%) and 40–59 (15.7%).
- Sandwiches, which include burgers, and poultry were the top two contributors of protein intake among youth and adults, with some differences by age group.
- The percentage of calories consumed from protein decreased from 14.8% in 2013–2014 to 13.9% in August 2021–August 2023 among youth and from 16.1% to 15.5% among adults.

Introduction

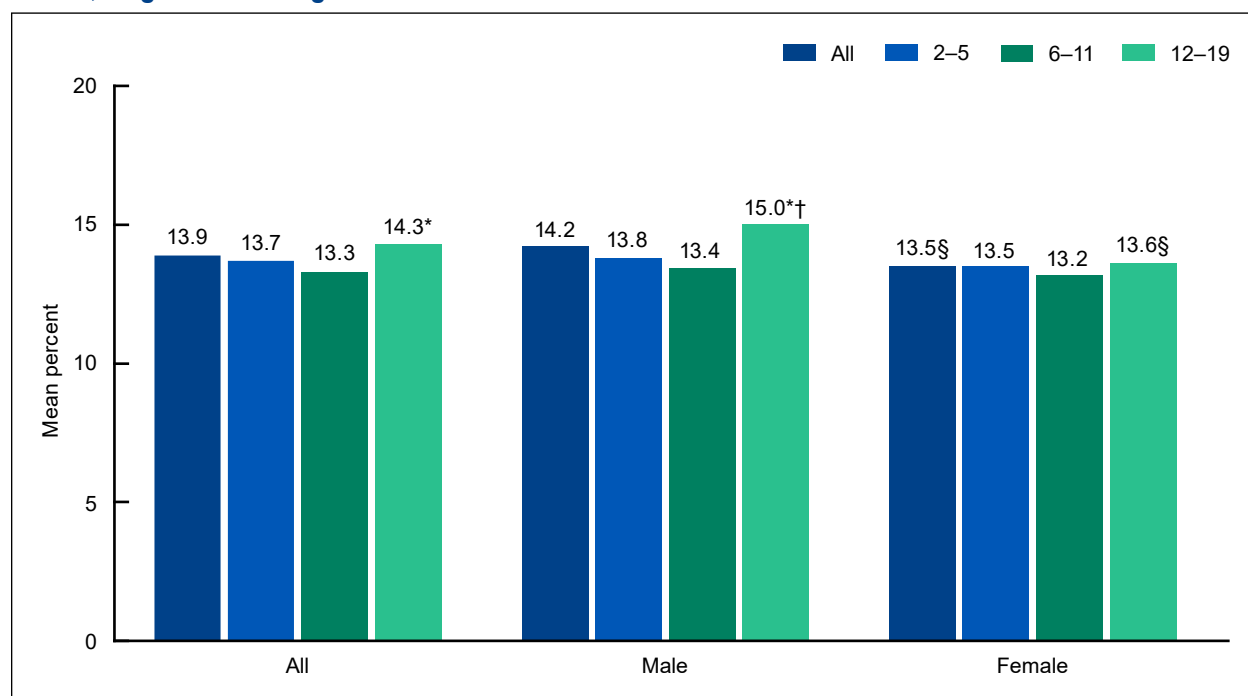
Adequate protein intake is essential for overall health (1,2). The 2025–2030 Dietary Guidelines for Americans emphasize prioritizing high-quality, nutrient-dense protein foods, including eggs, poultry, seafood, and meat (1). This report presents estimates on the mean percentage of total calories from protein and the mean percentage of total protein consumed from the top five food sources on a given day among youth and adults in the United States during August 2021–August 2023. Trends in the percentage of calories from protein consumed from 2013–2014 through August 2021–August 2023 are also presented.



Calories from protein among youth

- During August 2021–August 2023, youth ages 2–19 consumed 13.9% of calories from protein on a given day (Figure 1, Table 1).
- Adolescents ages 12–19 consumed more calories from protein (14.3%) than children ages 6–11 (13.3%).
- Males ages 12–19 consumed more calories from protein (15.0%) than males ages 2–5 (13.8%) and 6–11 (13.4%).
- Among females, no significant differences by age were seen in calories consumed from protein.
- Males consumed more calories from protein (14.2%) than females (13.5%). Among adolescents ages 12–19, males consumed more calories from protein than females (13.6%).

Figure 1. Mean percentage of calories from protein among youth, by age group and sex: United States, August 2021–August 2023



* Significantly different from ages 6–11 ($p < 0.05$).

† Significantly different from ages 2–5 ($p < 0.05$).

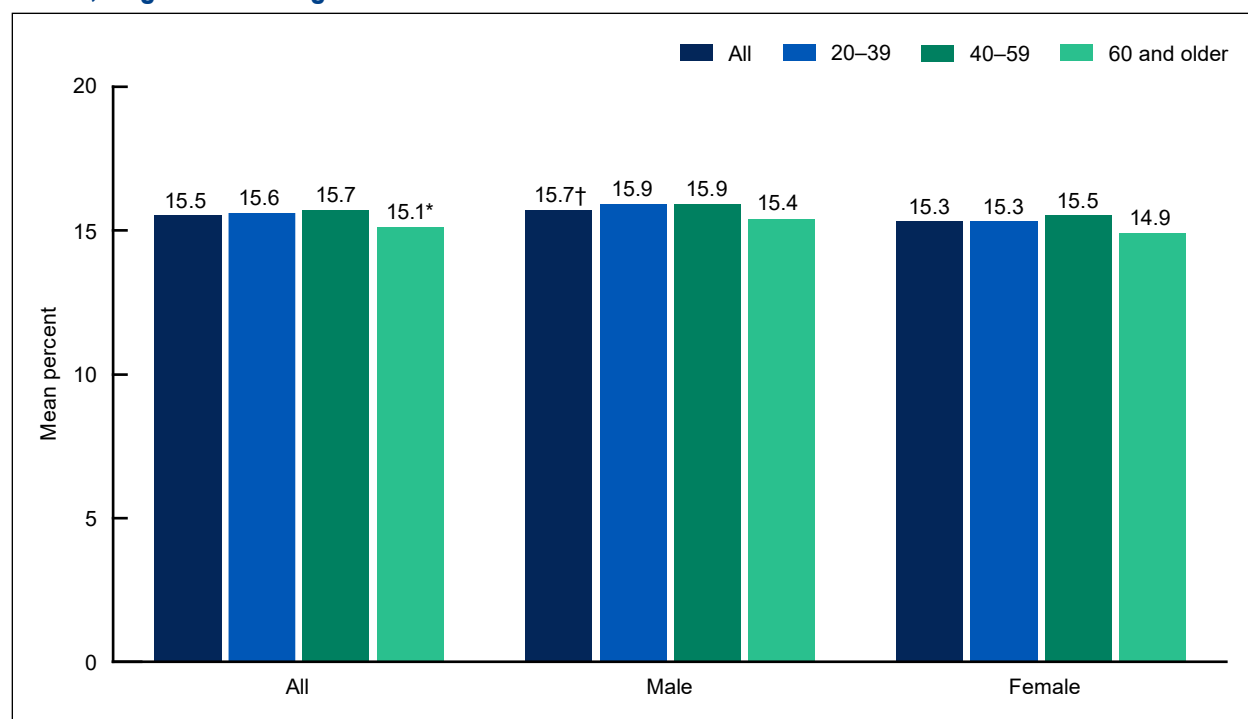
§ Significantly different from males of the same age group ($p < 0.05$).

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Calories from protein among adults

- During August 2021–August 2023, adults age 20 and older consumed 15.5% of calories from protein on a given day (Figure 2, Table 2).
- Adults age 60 and older consumed fewer calories from protein (15.1%) than adults ages 20–39 (15.6%) and 40–59 (15.7%).
- Among all adults, males consumed more calories from protein (15.7%) than females (15.3%), but no significant differences were observed within each age group by sex.
- No significant differences were seen within each sex by age.

Figure 2. Mean percentage of calories from protein among adults, by age group and sex: United States, August 2021–August 2023



* Significantly different from ages 20–39 and 40–59 ($p < 0.05$).

† Significantly different from females of the same age group ($p < 0.05$).

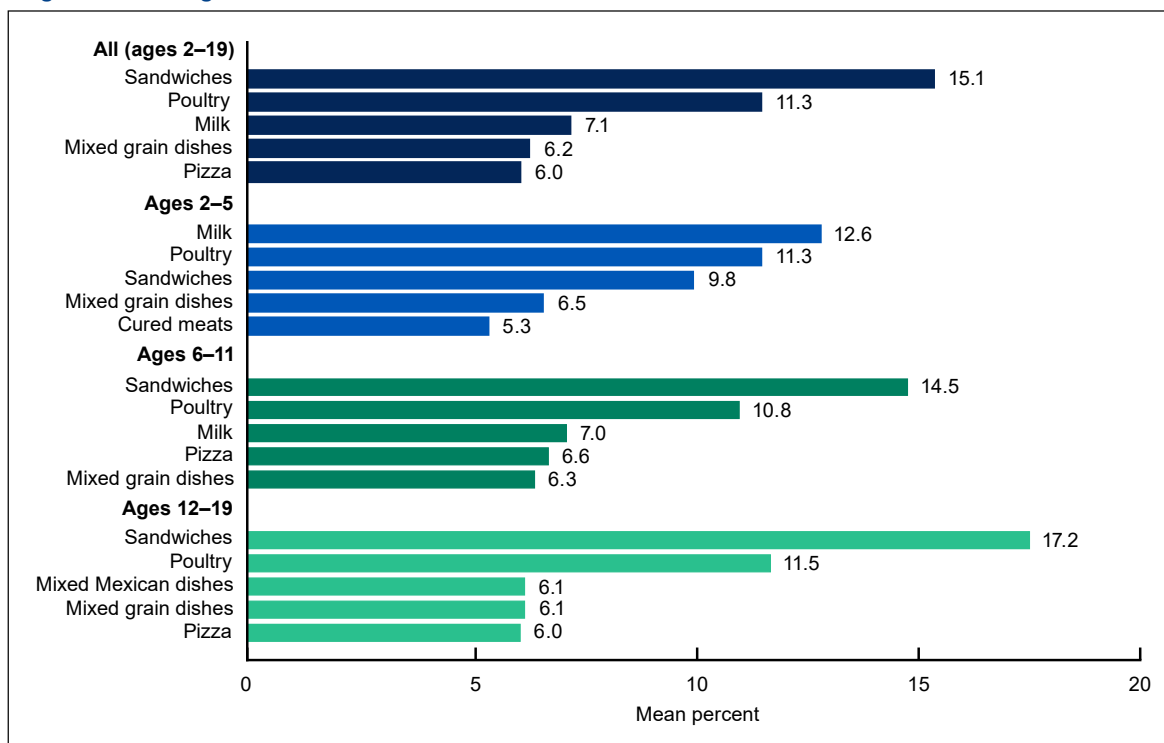
SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Sources of protein intake among youth

- During August 2021–August 2023, the top five protein sources among youth ages 2–19 were sandwiches (15.1%), poultry (11.3%), milk (7.1%), mixed grain dishes (6.2%), and pizza (6.0%) (Figure 3, Table 3).
- Among children ages 2–5, the top protein sources were milk (12.6%), poultry (11.3%), sandwiches (9.8%), mixed grain dishes (6.5%), and cured meats (5.3%).

- Among children ages 6–11, the top sources were sandwiches (14.5%), poultry (10.8%), milk (7.0%), pizza (6.6%), and mixed grain dishes (6.3%).
- Among adolescents ages 12–19, the top sources were sandwiches (17.2%), poultry (11.5%), mixed Mexican dishes (6.1%), mixed grain dishes (6.1%), and pizza (6.0%).

Figure 3. Top contributors of protein intake among youth, by age group: United States, August 2021–August 2023



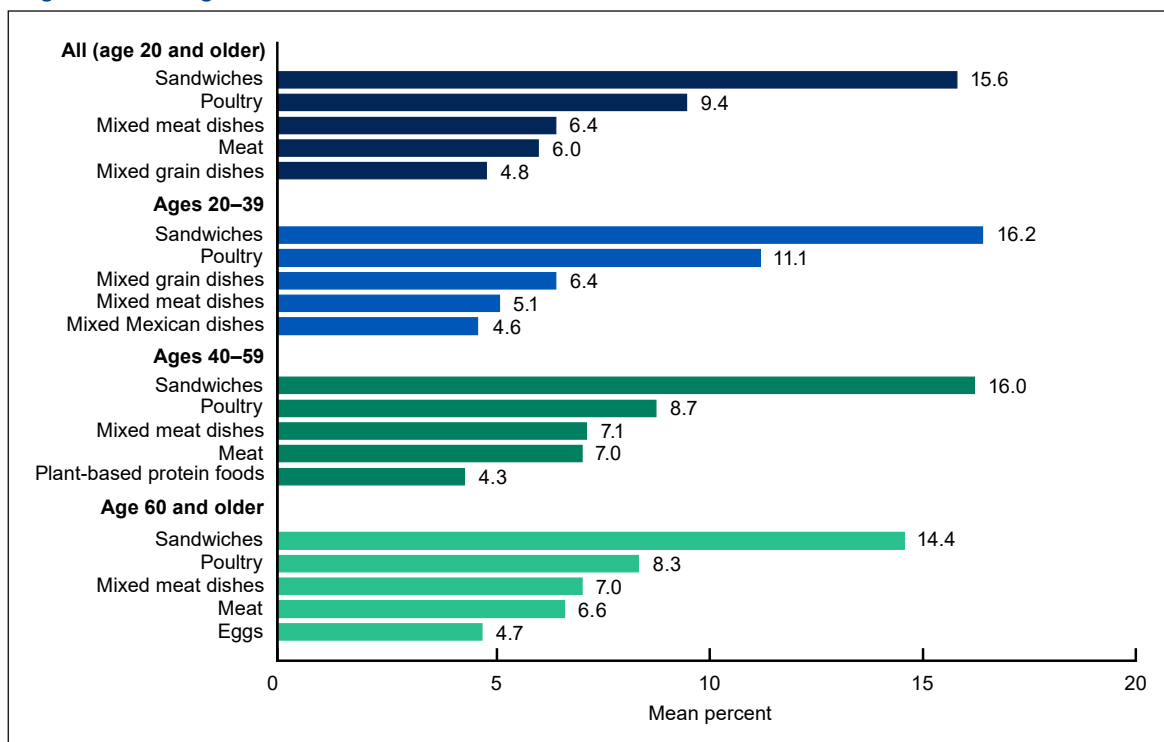
NOTE: Foods are grouped into categories using the Department of Agriculture's "What We Eat in America."

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Sources of protein intake among adults

- During August 2021–August 2023, the top five protein sources among adults age 20 and older were sandwiches (15.6%), poultry (9.4%), mixed meat dishes (6.4%), meat (6.0%), and mixed grain dishes (4.8%) (Figure 4, Table 4).
- Among adults ages 20–39, the top protein sources were sandwiches (16.2%), poultry (11.1%), mixed grain dishes (6.4%), mixed meat dishes (5.1%), and mixed Mexican dishes (4.6%).
- Among adults ages 40–59, the top protein sources were sandwiches (16.0%), poultry (8.7%), mixed meat dishes (7.1%), meat (7.0%), and plant-based protein foods (4.3%).
- Among adults age 60 and older, the top protein sources were sandwiches (14.4%), poultry (8.3%), mixed meat dishes (7.0%), meat (6.6%), and eggs (4.7%).

Figure 4. Top contributors of protein intake among adults, by age group: United States, August 2021–August 2023



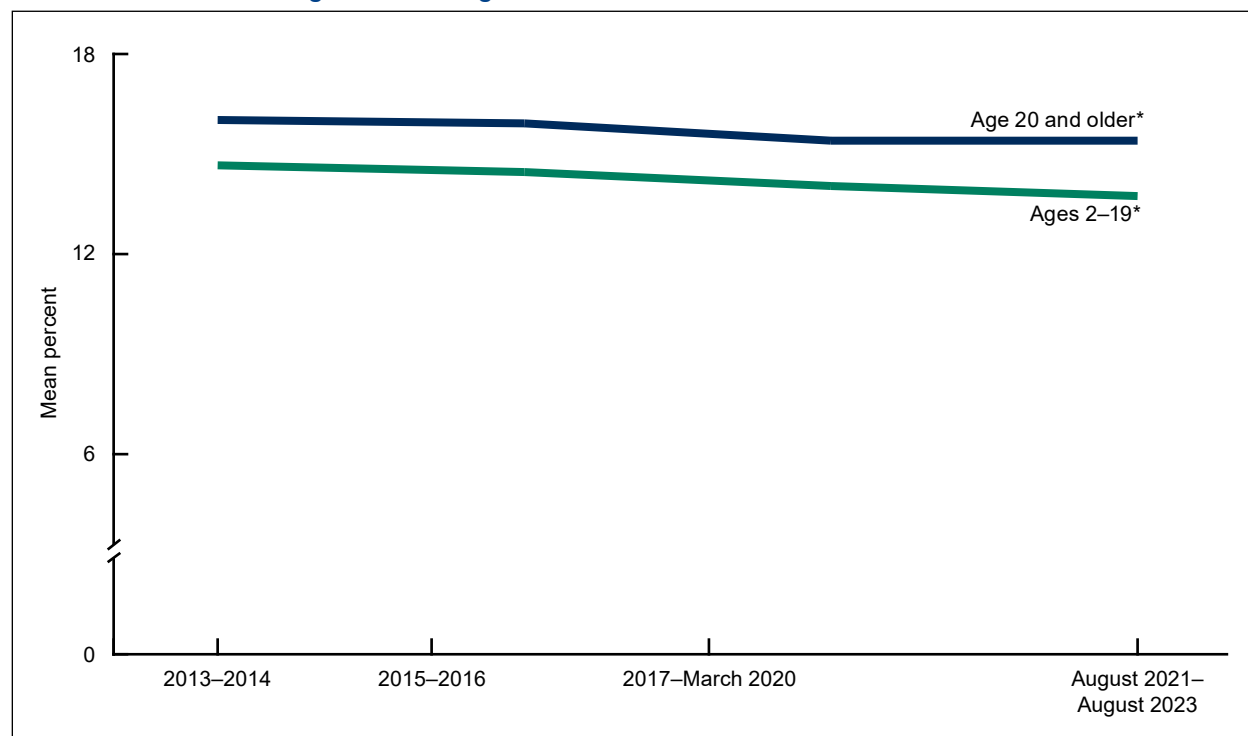
NOTE: Foods are grouped into categories using the Department of Agriculture's "What We Eat in America."

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Trends in calories from protein

- Among youth, the percentage of calories consumed from protein decreased from 14.8% in 2013–2014 to 13.9% in August 2021–August 2023 ([Figure 5](#), [Table 5](#)).
- Among adults, the percentage of calories consumed from protein decreased from 16.1% to 15.5% during the same period.

Figure 5. Trends in mean percentage of calories from protein among youth and adults: United States, 2013–2014 to August 2021–August 2023



* Significant decreasing linear trend ($p < 0.05$).

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Summary

During August 2021–August 2023, youth consumed 13.9% of calories from protein and adults consumed 15.5% of calories from protein. Among youth, adolescents ages 12–19 consumed the highest percentage of calories from protein (14.3%). Among adults, consumption was lowest among those age 60 and older (15.1%). Overall, sandwiches and poultry were the top two contributors to total protein intake for both youth and adults. However, some differences were seen by age group among children. For children ages 2–5, milk was the top contributor of protein intake, while sandwiches were the top contributor for children ages 6–11 and adolescents ages 12–19. Among adults, the top five contributors of protein intake differed by age group. For example, the fifth highest contributor of protein intake was mixed Mexican dishes for ages 20–39, plant-based protein foods for ages 40–59, and eggs for age 60 and older.

From 2013–2014 through August 2021–August 2023, the percentage of calories consumed from protein decreased for both youth and adults. Continued monitoring of protein intake and sources of protein will provide important information on dietary intake among youth and adults in the United States.

Definition

Food categories: The 49 food categories in the U.S. Department of Agriculture’s “What We Eat in America” were used to categorize foods and identify top contributors of total protein intake (3). Sandwiches include burgers; frankfurter, chicken filet, egg and breakfast, cheese, peanut butter and jelly, seafood, deli and cured meat, meat and BBQ, and vegetable sandwiches; and vegetable burgers. Poultry includes chicken (whole pieces, patties, nuggets, and tenders), turkey, duck, and other poultry. Cured meats include cold cuts and other cured meats, bacon, frankfurters, and sausages. Mixed meat dishes include poultry, seafood, and other mixed meat dishes. Plant-based protein foods include beans, peas, legumes, nuts, seeds, and soy- and meat-alternative products. Milk includes whole, reduced fat, low fat, and nonfat milk. Eggs include omelets and other eggs. Mixed grain dishes include rice mixed dishes, pasta mixed dishes, macaroni and cheese, turnovers, and other grain-based items. Mixed Mexican dishes include burritos, tacos, nachos, and other Mexican mixed dishes.

Data source and methods

Data from the August 2021–August 2023 National Health and Nutrition Examination Survey (NHANES) cycle were used to estimate the mean percentage of calories from protein and the mean percentage of protein from food categories consumed on a given day. NHANES is a cross-sectional, nationally representative sample of the U.S. civilian noninstitutionalized population. The sample is selected using a complex, multistage probability design. NHANES consists of home interviews followed by health examinations in a mobile examination center (MEC) and two 24-hour dietary recall interviews (4).

NHANES was conducted continuously from 1999 through March 2020, when data collection was paused due to the COVID pandemic. In August 2021, NHANES resumed data collection with modified operations and procedures (5), including a change in the mode of dietary data collection for the August 2021–August 2023 cycle (6). In previous cycles, the first 24-hour dietary recall interview was conducted in person during the MEC visit. In August 2021–August 2023, both 24-hour dietary recall interviews were conducted by telephone on separate days following the MEC visit (6).

For the current analysis, all participants age 2 and older with reliable Day 1 dietary recall data were included. Pregnant and lactating women and children receiving breast milk were excluded. The mean proportion of calories from protein was calculated for youth and adults overall and by age group. The population proportion method was used to calculate the percentage of protein from each food group (7). Day 1 dietary interview sample weights were used to account for probability of selection, noncoverage, nonresponse, and day of the week. Statistical significance was set at $p < 0.05$. Statistical analyses were conducted using R version 4.4.1 and the R survey package.

About the authors

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Figure tables

Data table for Figure 1. Mean percentage of calories from protein among youth, by age group and sex: United States, August 2021–August 2023

Age group and sex	Sample size	Mean percent	95% confidence interval	Standard error
All	1,763	13.9	13.7–14.0	0.1
2–5	397	13.7	13.2–14.1	0.2
6–11	609	13.3	13.0–13.7	0.2
12–19	757	14.3*	13.9–14.8	0.2
Male				
All	872	14.2	14.0–14.5	0.1
2–5	205	13.8	13.1–14.4	0.3
6–11	301	13.4	13.0–13.8	0.2
12–19	366	15.0*†	14.4–15.6	0.3
Female				
All	891	13.5§	13.1–13.8	0.2
2–5	192	13.5	12.9–14.1	0.3
6–11	308	13.2	12.7–13.7	0.2
12–19	391	13.6§	13.1–14.1	0.2

* Significantly different from ages 6–11 ($p < 0.05$).

† Significantly different from ages 2–5 ($p < 0.05$).

§ Significantly different from males of the same age group ($p < 0.05$).

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Data table for Figure 2. Mean percentage of calories from protein among adults, by age group and sex: United States, August 2021–August 2023

Age group and sex	Sample size	Mean percent	95% confidence interval	Standard error
All	4,735	15.5	15.3–15.7	0.1
20–39	1,058	15.6	15.3–15.9	0.2
40–59	1,325	15.7	15.4–16.1	0.2
60 and older	2,352	15.1*	14.9–15.4	0.1
Male				
All	2,113	15.7†	15.5–16.0	0.1
20–39	482	15.9	15.5–16.2	0.2
40–59	574	15.9	15.4–16.4	0.3
60 and older	1,057	15.4	15.2–15.6	0.1
Female				
All	2,622	15.3	15.0–15.5	0.1
20–39	576	15.3	14.9–15.8	0.2
40–59	751	15.5	15.1–16.0	0.2
60 and older	1,295	14.9	14.5–15.3	0.2

* Significantly different from ages 20–39 and 40–59 ($p < 0.05$).

† Significantly different from females of the same age group ($p < 0.05$).

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Data table for Figure 3. Top contributors of protein intake among youth, by age group: United States, August 2021–August 2023

Age group and food category	Mean percent	95% confidence interval	Standard error
All (<i>n</i> = 1,763)			
Sandwiches	15.1	(13.1–17.0)	1.0
Poultry	11.3	(10.0–12.5)	0.6
Milk	7.1	(6.5–7.8)	0.3
Mixed grain dishes	6.2	(5.2–7.2)	0.5
Pizza	6.0	(5.0–7.0)	0.5
Ages 2–5 (<i>n</i> = 397)			
Milk	12.6	(11.4–13.8)	0.6
Poultry	11.3	(9.8–12.7)	0.7
Sandwiches	9.8	(6.8–12.8)	1.5
Mixed grain dishes	6.5	(4.8–8.1)	0.8
Cured meats	5.3	(2.6–8.1)	1.4
Ages 6–11 (<i>n</i> = 609)			
Sandwiches	14.5	(12.4–16.5)	1.0
Poultry	10.8	(8.9–12.7)	1.0
Milk	7.0	(6.2–7.8)	0.4
Pizza	6.6	(5.0–8.1)	0.8
Mixed grain dishes	6.3	(5.6–7.1)	0.4
Ages 12–19 (<i>n</i> = 757)			
Sandwiches	17.2	(14.4–19.9)	1.4
Poultry	11.5	(9.9–13.1)	0.8
Mixed Mexican dishes	6.1	(4.5–7.8)	0.8
Mixed grain dishes	6.1	(4.3–7.8)	0.9
Pizza	6.0	(4.5–7.6)	0.8

NOTES: Foods are grouped into categories using the Department of Agriculture's "What We Eat in America." *n* is the unweighted sample size.
SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Data table for Figure 4. Top contributors of protein intake among adults, by age group: United States, August 2021–August 2023

Age group and food category	Mean percent	95% confidence interval	Standard error
All (n = 4,735)			
Sandwiches	15.6	(14.3–16.9)	0.6
Poultry	9.4	(8.2–10.6)	0.6
Mixed meat dishes	6.4	(5.6–7.1)	0.4
Meat	6.0	(5.2–6.8)	0.4
Mixed grain dishes	4.8	(4.0–5.6)	0.4
Ages 20–39 (n = 1,058)			
Sandwiches	16.2	(14.4–17.9)	0.9
Poultry	11.1	(8.7–13.4)	1.2
Mixed grain dishes	6.4	(4.3–8.5)	1.1
Mixed meat dishes	5.1	(4.3–6.0)	0.4
Mixed Mexican dishes	4.6	(2.7–6.5)	1.0
Ages 40–59 (n = 1,325)			
Sandwiches	16.0	(14.0–18.1)	1.0
Poultry	8.7	(7.1–10.2)	0.8
Mixed meat dishes	7.1	(5.4–8.9)	0.9
Meat	7.0	(5.6–8.4)	0.7
Plant-based protein foods	4.3	(3.7–4.9)	0.3
Age 60 and older (n = 2,352)			
Sandwiches	14.4	(13.0–15.7)	0.7
Poultry	8.3	(7.6–9.1)	0.4
Mixed meat dishes	7.0	(6.2–7.8)	0.4
Meat	6.6	(5.2–8.1)	0.7
Eggs	4.7	(4.0–5.4)	0.3

NOTES: Foods are grouped into categories using the Department of Agriculture's "What We Eat in America." n is unweighted sample size.
SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Data table for Figure 5. Trends in mean percentage of calories from protein among youth and adults: United States, 2013–2014 to August 2021–August 2023

Age group and survey year	Sample size	Mean percent	95% confidence interval	Standard error
Ages 2–19				
2013–2014	3,020	14.8	(14.4–15.2)	0.2
2015–2016	2,900	14.6	(14.4–14.8)	0.1
2017–March 2020	4,090	14.2	(13.9–14.5)	0.2
August 2021–August 2023	1,763	13.9*	(13.7–14.0)	0.1
Age 20 and older				
2013–2014	4,947	16.1	(15.7–16.5)	0.2
2015–2016	4,914	16.0	(15.7–16.3)	0.2
2017–March 2020	7,574	15.5	(15.3–15.7)	0.1
August 2021–August 2023	4,735	15.5*	(15.3–15.7)	0.1

*Significant decreasing linear trend ($p < 0.05$).

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Suggested citation

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