



Food Surveys Research Group  
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# Late Evening Food and Beverage Consumption by Adults in the U.S.

## What We Eat in America, NHANES 2013-2016

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### Highlights

- ▶ Nearly two-thirds of adults (64%) consumed a food and/or beverage other than plain water in the late evening, with an inverse trend in prevalence by age.
- ▶ Late evening consumption was more common among non-Hispanic blacks than among non-Hispanic whites.
- ▶ About one in five (21%) adults obtained 30% or more of total daily energy from late evening foods and beverages.
- ▶ Adults who consumed foods/beverages in the late evening had a higher total daily energy intake than those who did not.
- ▶ The mean energy contribution of food/beverages consumed in the late evening varied by race/ethnicity.
- ▶ Late evening consumption's contribution to total daily alcohol intake was about twice as high as its contribution to total daily energy.
- ▶ In the late evening, the most commonly consumed type of food was "snacks and sweets" and the most commonly consumed beverage was water.

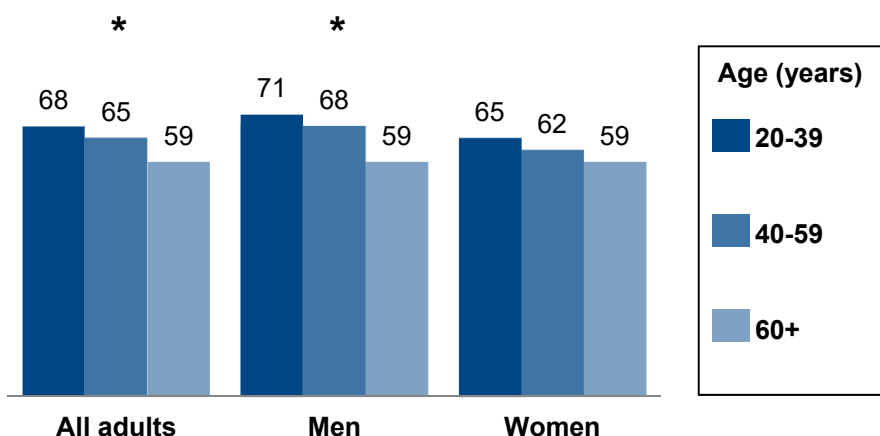
Food and beverage consumption late in the day is a topic of recent interest due to its potential negative implications for health (1-4). However, current details about U.S. consumption during this time of day are lacking. The purpose of this data brief is to characterize food/beverage consumption by U.S. adults during the "late evening" time period from 8:00 pm through 11:59 pm (*see "Definitions" on page 8*). 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) 2013-2016.

### Who consumed foods/beverages in the late evening?

On any given day, 64% of all adults age 20 years and older consumed one or more foods or beverages other than plain water in the late evening (*data not shown*). This percentage was not different on weekends than on weekdays.

Prevalence of late evening consumption did not differ by sex (67% of men and 62% of women). However, an inverse relationship between age and prevalence was seen among all adults and among men but not among women (figure 1).

**Figure 1. Prevalence (%) of late evening consumption among adults age 20+ years, by sex and age, WWEIA, NHANES 2013-2016**



\*Inverse linear trend ( $p < 0.001$ ) in prevalence of late evening consumption by age.



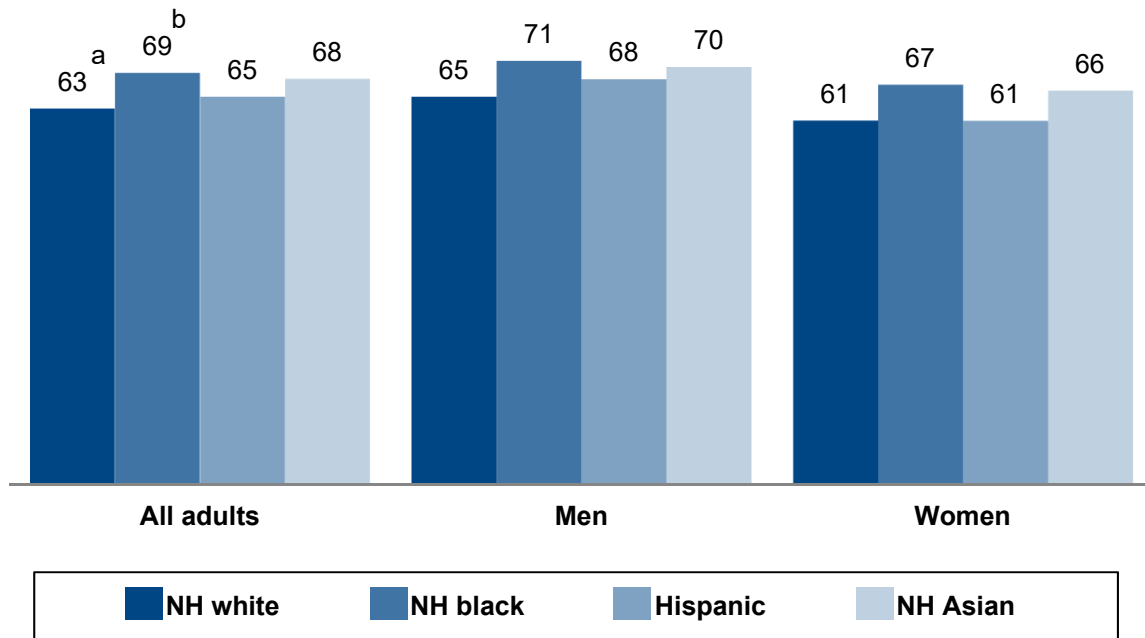
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**Did the prevalence of late evening food/beverage consumption differ by race/ethnicity?**

Among all adults analyzed together, a higher percentage of non-Hispanic (NH) blacks than of NH whites consumed foods/beverages in the late evening (figure 2). No other differences in prevalence of late evening consumption by race/ethnicity were seen.

**Figure 2. Prevalence (%) of late evening consumption among adults age 20+ years, by sex and race/ethnicity<sup>1</sup>, WWEIA, NHANES 2013-2016**



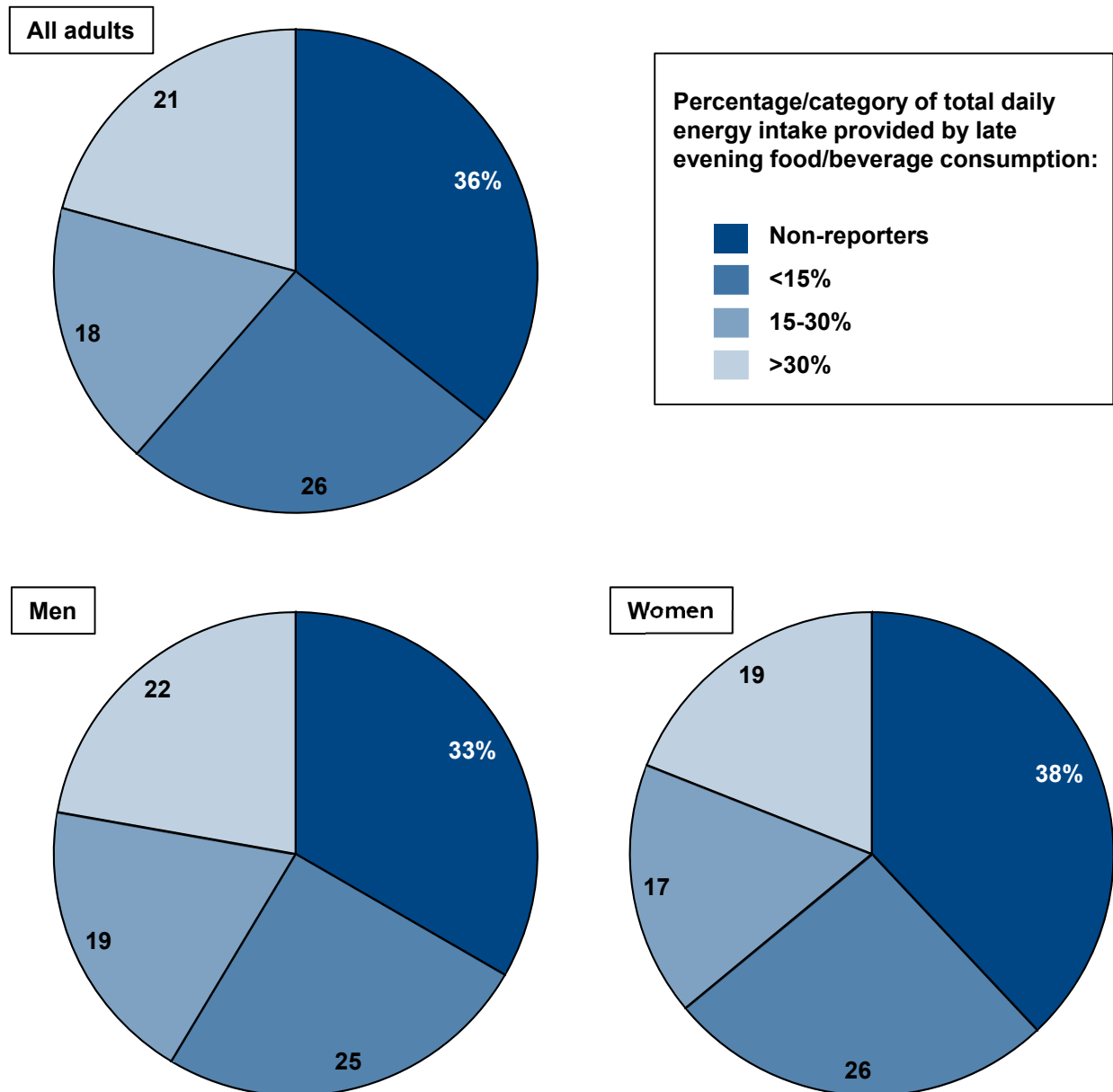
<sup>a,b</sup>Estimates with different superscripts differed by race/ethnicity ( $p < 0.001$ ).

**What percentage of total daily energy was consumed in the late evening?**

Late evening consumption accounted for 15.6% of total daily energy intake by U.S. adults overall (*data not shown*). The average contribution to daily energy by late evening foods/beverages was higher among men than among women (16.8% vs. 14.5%;  $p < 0.001$ ).

Distributions of individuals classified into categories of energy intake are shown in figure 3 for all adults and by sex. Being considered a late evening reporter or non-reporter was based on whether the individual consumed anything besides plain water during the late evening period.

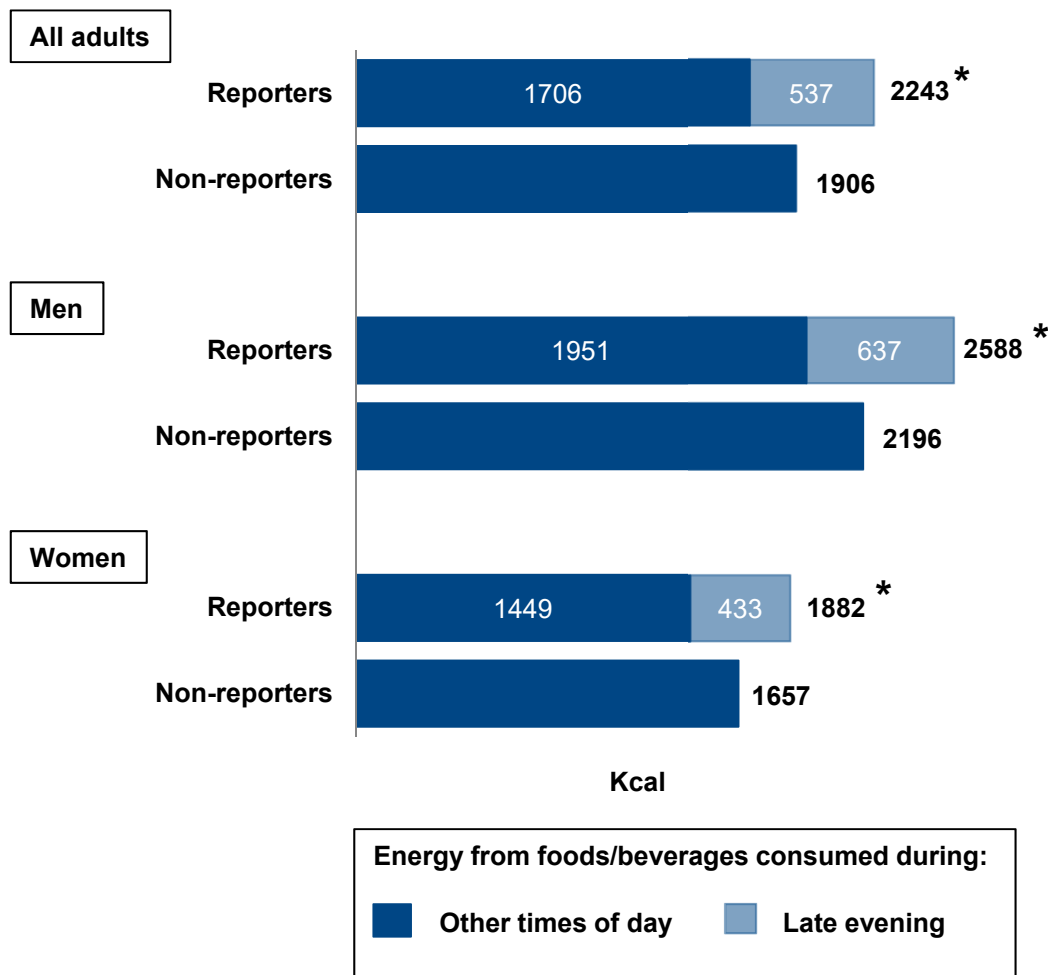
**Figure 3. Distribution of individuals into categories of total daily energy intake from late evening consumption, adults age 20+ years, by sex, WWEIA, NHANES 2013-2016**



**Was total daily energy intake higher for adults who consumed foods/beverages during the late evening (reporters) than for those who did not (non-reporters)?**

Among all adults and by sex, mean total daily energy intake was higher for reporters of late evening foods/beverages than for non-reporters (figure 4). On average, the difference in total daily energy intake between reporters and non-reporters was 337 kcal for all adults, 392 kcal for men, and 225 kcal for women.

**Figure 4. Energy intake (kcal<sup>1</sup>) by late evening consumption status, adults age 20+ years, by sex, WWEIA, NHANES 2013-2016**



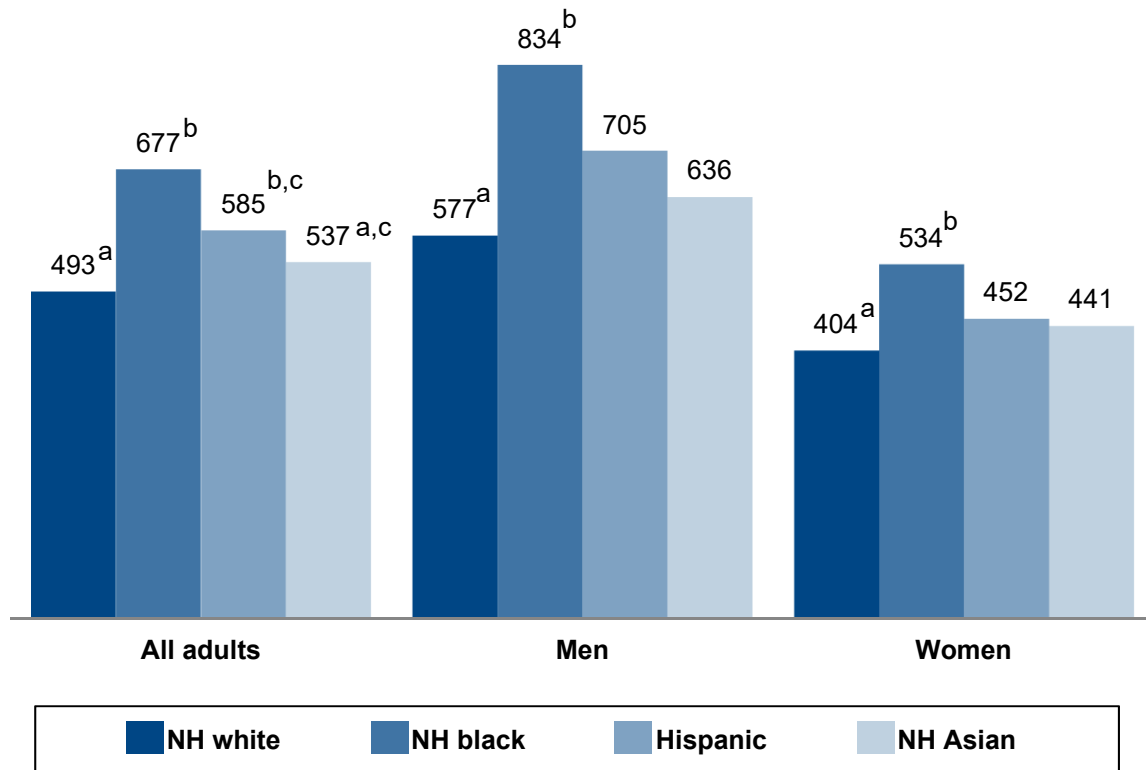
<sup>1</sup>kcal, kilocalories

\*Within sex, total daily energy intake differed between adults who consumed foods/beverages other than plain water during the late evening and those who did not ( $p < 0.001$ ).

**Among late evening reporters, did the amount of energy consumed during the late evening differ by race/ethnicity?**

Non-Hispanic (NH) blacks who reported food/beverages in the late evening consumed more energy during this time period than did NH whites and NH Asians (figure 5), and Hispanics consumed more energy in the late evening than did NH whites. When intakes were analyzed by sex, the only difference seen was that, for both men and women, late evening energy intakes by NH blacks were higher than those by NH whites.

**Figure 5. Energy (kcal<sup>1</sup>) provided by late evening consumption, adults age 20+ years, reporters only, by sex and race/ethnicity, WWEIA, NHANES 2013-2016**



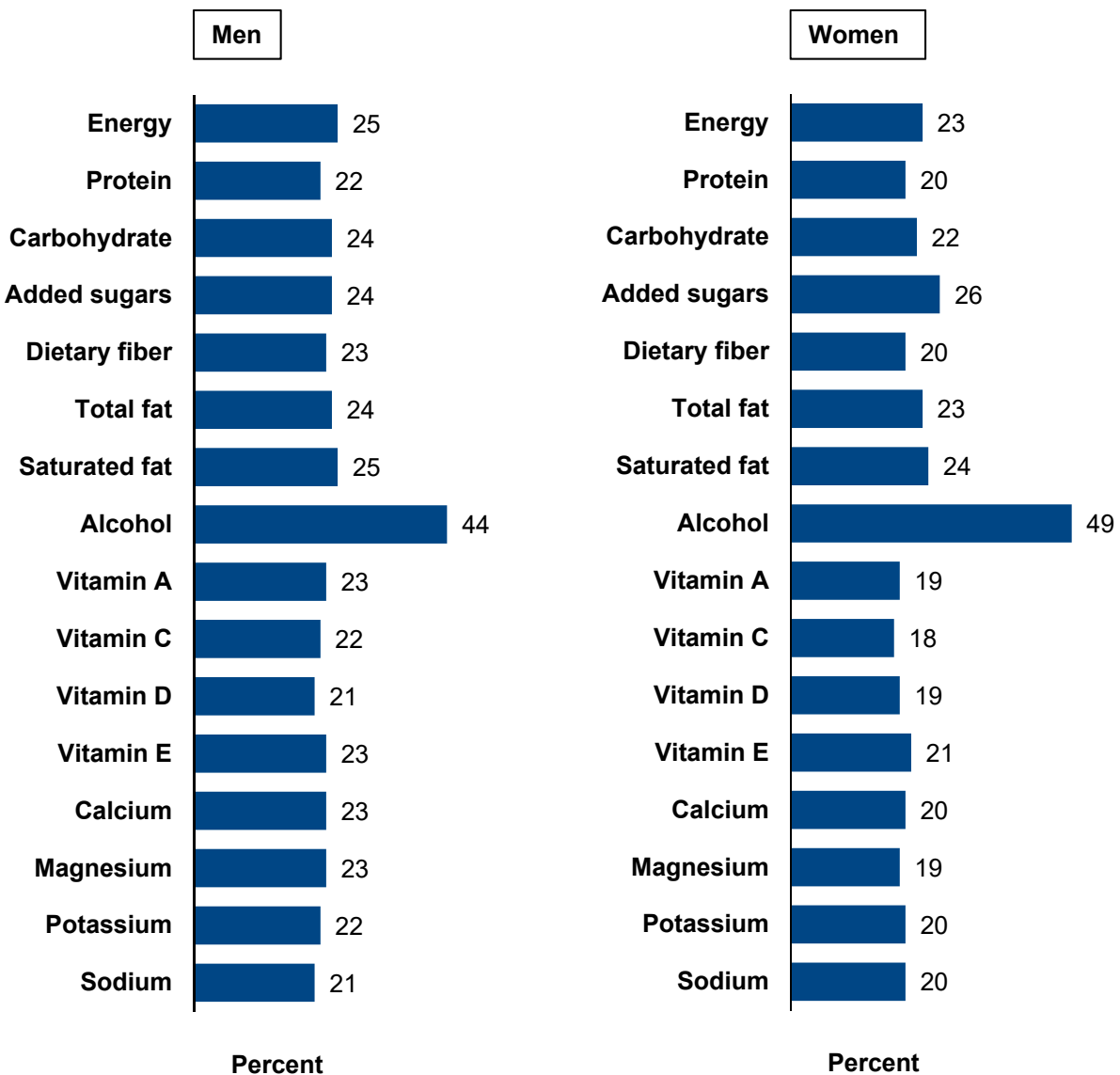
<sup>1</sup>kcal, kilocalories

<sup>a,b,c</sup>Within sex, estimates with different superscripts differed by race/ethnicity (p<0.001).

**Among late evening reporters, how much did late evening consumption contribute to total daily intakes of energy and nutrients?**

Among late evening reporters overall, foods and beverages consumed during the late evening accounted for 24% of the total daily energy intake (*data not shown*). Late evening consumption’s contributions to intakes of most nutrients were comparable to its energy contribution, as shown in figure 6. However, the contribution of late evening consumption to alcohol was approximately double its contribution to energy, accounting for nearly one-half of adults’ total daily intake of alcohol.

**Figure 6. Contributions by late evening consumption to total daily intakes of energy and selected nutrients, adults age 20+ years, reporters only, by sex, WWEIA, NHANES 2013-2016**



### What foods were commonly consumed in the late evening?

Among late evening reporters, 87% consumed a food item during that time period (table 1). The most commonly consumed WWEIA Food Category was “snacks and sweets,” reported by nearly one-half of late evening reporters. Among all WWEIA Food Categories, mixed dishes contributed the largest mean amount of energy to intakes of late evening reporters who consumed them.

**Table 1. Foods most frequently consumed in the late evening: Percentage of late evening reporters consuming and mean energy contribution when consumed, adults age 20+ years, WWEIA, NHANES 2013-2016**

WWEIA Food Category	Reporters consuming (%)	Mean energy contribution per reporter consuming a food from that category (kcal) <sup>1</sup>
<b>All foods</b>	87	495
Snacks and sweets	49	281
Sweet bakery products	17	321
Savory snacks	13	216
Other desserts	12	272
Candy	10	152
Mixed dishes	29	538
Sandwiches	9	490
Grain-based mixed dishes	6	437
Protein foods	17	327
Plant-based protein foods	6	283
Poultry	5	351
Vegetables	14	215
Vegetables, excluding potatoes	10	155
White potatoes	6	243
Grains	12	278
Breads, rolls, tortillas	5	226
Fruits	11	98
Cheese and yogurt	5	163

<sup>1</sup>kcal, kilocalories

### What beverages were commonly consumed in the late evening?

Nearly three-fourths of adult late evening reporters consumed a beverage item during that time period (table 2). Plain water, the most frequently consumed beverage, was reported by one-third of late evening reporters. Whereas the mean energy contribution from beverages consumed by reporters during the late evening was 149 kcal, some beverage categories contributed substantially more to the total daily intake of those who consumed them, such as beer and liquor and cocktails, and some contributed substantially less, such as water, diet beverages, coffee, and tea.

**Table 2. Beverages most frequently consumed in the late evening: Percentage of adult reporters consuming and mean energy contribution when consumed, adults 20+ years, WWEIA, NHANES 2013-2016**

WWEIA Food Category	Reporters consuming (%)	Mean energy contribution per reporter consuming a beverage from that category (kcal) <sup>1</sup>
<b>All beverages</b>	71	149
Nonalcoholic:	62	88
Water	33	1
Plain water	31	0
Tap water	20	0
Bottled water	12	0
Sweetened beverages	15	169
Soft drinks	9	169
Tea	8	69
Milk	6	162
Diet beverages	5	7
Diet soft drinks	4	6
Coffee	4	51
100% juice	4	144
Alcoholic:	14	357
Beer	7	367
Liquor and cocktails	4	399
Wine	4	224

<sup>1</sup>kcal, kilocalories.



## Definitions

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

**Late evening consumption:** Food and/or beverage intake that commenced between 8:00 pm and 11:59 pm on the intake day.

**Reporters/non-reporters:** In general, anyone who reported any late evening consumption (*see definition above*) was considered a “reporter,” whereas anyone who reported no late evening consumption was considered a “non-reporter.” The single exception was that individuals who reported only plain water during the late evening were considered non-reporters. In all, 6,345 adults were classified as late evening reporters (3,154 men and 3,191 women), and 3,516 were classified as non-reporters (1,675 men and 1,841 women). Classification as a reporter or non-reporter for this analysis has no implications as to habitual consumption. People classified as non-reporters may consume foods and/or beverages in the late evening on some days, even though they did not on the intake day. Likewise, those classified as reporters do not necessarily consume foods and/or beverages in the late evening every day.

**Weekdays/weekends:** Dietary intakes were collected across all days of the week. For this analysis, Monday through Thursday were considered weekdays, and Friday through Sunday were considered weekend days.

**WWEIA Food Categories:** Available at [www.ars.usda.gov/Services/docs.htm?docid=23429](http://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 approximately 150 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 tomato sandwich represented in the dietary data as bread, tomato, lettuce, and spread would be assigned to the “sandwiches” group, along with the 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).” Similarly, if sugar was 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 presented on page 8. In the WWEIA Food Categories, water and milk (as well as other dairy beverage categories, namely, flavored milk and dairy drinks and substitutes) are in separate categories, rather than being included under “nonalcoholic beverages” as they were in this analysis.

## Data source

Estimates in this data brief are based on one day of data from WWEIA, NHANES 2013-2016 (5). 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 10,064 individuals age 20 years and older (4,829 men and 5,235 women) provided complete and reliable dietary intake data. Pregnant and lactating women (n = 203) were excluded from this analysis. Only in the race-specific analyses (see pages 2 and 5), individuals who were multi-racial or of a racial group other than those listed (324 adults, of whom 223 were late evening reporters) were excluded. Sample weights were applied in all analyses to produce nationally representative estimates. Intakes of energy and nutrients were calculated using the 2013-2014 and 2015-2016 versions of USDA’s Food and Nutrient Database for Dietary Studies (6) and Food Patterns Equivalents Database (7).

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