

WHAT IS THE RELATIONSHIP BETWEEN THE FREQUENCY OF EATING AND ACHIEVING NUTRIENT AND FOOD GROUP RECOMMENDATIONS?: DATA ANALYSIS PROTOCOL

This document describes the protocol for data analysis to address the following question:

What is the relationship between the frequency of eating and achieving nutrient and food group recommendations?

This data analysis is being conducted by the 2020 Dietary Guidelines Advisory Committee, Data Analysis and Food Pattern Modeling Cross-Cutting Working Group, with support from a federal interagency data analysis team (DAT).

This document includes details about the methodology as it will be applied to the data analysis as follows:

- The [analytic framework](#) (p. 2) describes the overall scope of the question and approach used to describe food group and nutrient intakes
- The [analytic plan](#) (p. 4) details the data and subsequent included analyses
- The [analysis results](#) (p. 7) includes reports that describe the analytic methods and summarize results (e.g. data tables and figures)

This protocol is up-to-date as of: 10/22/2019.

ANALYTIC FRAMEWORK

The analytic framework describes the overall scope of the analyses, including the population and type of analyses and data sources identified to answer the question. It also includes the definitions of key terms.

Question: What is the relationship between the frequency of eating and achieving nutrient and food group recommendations?

Frequency of eating, with and without naming conventions, will be described and evaluated in the following ways:

- Distribution of eating event frequency in a 24 hour period (midnight to midnight)
- Hourly distribution of eating events in a 24 hour period
- Percent of Americans engaging in self-described meals (e.g. breakfast, lunch, dinner) and snacks including beverage events in a 24 hour period (midnight to midnight)
- Time (hour of the day) in which self-described meals and snacks including beverage events are consumed in a 24 hour period (midnight to midnight)

The relationship between frequency of eating and achieving nutrient and food group recommendations will be evaluated in the following ways:

Examined by eating event type with naming convention

- Proportion of daily food group and subgroup intake by eating event type
- Proportion of daily nutrient intake by eating event type

Proportion of total energy intake and select dietary component intakes during defined times of the day is under discussion

Population: Nationally representative sample of the U.S. population

Life stages:

- Children and adolescents (ages 2-19 years)
- Adults (ages 20-64 years)
- Older Adults (ages 65 years and older)

Note: exceptions to age groupings will be noted.

Demographic subgroups:

- Sex
- Race-ethnicity
- Socioeconomic status (e.g., income, education)

Data Source:

What We Eat in America, National Health and Nutrition Examination Survey (WWEIA, NHANES); cross-sectional, nationally representative dietary intake data

Data years:

The most recent cycle of WWEIA, NHANES data collected in 2015-2016 will be the most current data available for consideration by the Committee. For some analyses, multiple cycles of data will be combined to describe “current” intakes (e.g., 2013-2016).

Key definitions:

Stage of life - The age groups defined by the NHANES sampling weights or by the DRI age-sex groups.

Socioeconomic status - Indicators of socioeconomic status may include income in dollars, income as a percent of the poverty ratio, food security, eligibility for federal assistance programs, or level of education.

Eating event types - Survey respondents select the name of all eating occasions from a fixed list that was provided during the interview.

breakfast includes all eating occasions designated by the respondent as "breakfast", or the Spanish equivalents "desayuno", and "almuerzo"

lunch includes all eating occasions designated as "brunch", "lunch", or the Spanish equivalent "comida"

dinner includes all eating occasions designated as "dinner", "supper", or the Spanish equivalent "cena".

snack occasions include all reports of "snack", "drink", or "extended consumption" (items that were consumed over a long period of time). Spanish language interviewers used the Spanish language snack occasion names: "merienda", "entre comida", "botana", "bocadillo", "tentempie", and "bebida".

Snacks consist of one or more food and beverage items, including and excluding occasions in which plain water was the only item reported. In WWEIA, NHANES 2015-2016, water was the only item reported in approximately 27 percent of the snack occasions.

ANALYTIC PLAN

The following analyses will be used to describe the relationship between eating frequency and intakes of food groups and nutrients:

Children (2-19 years)

Distribution of eating event frequency in a 24 hour day (midnight to midnight) among U.S. children by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Hourly distribution of eating events in a 24 hour period (midnight to midnight) among U.S. children by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. children engaging in self-described breakfast (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. children engaging in self-described lunch (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. children engaging in self-described dinner (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. children engaging in self-described snacks, including beverage-only events (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Time (hour of the day) in which self-described meals and snacks including beverage events are consumed in a 24 hour period (midnight to midnight) among U.S. children by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Distribution of meal patterns (number of self-described meals and snacks) among U.S. children by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Proportion of daily food group and subgroup intake by eating event type among U.S. children by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Proportion of daily nutrient intake by eating event type among U.S. children by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016, limited to nutrients of public health concern

Adults (20-64 years)

Distribution of eating event frequency in a 24 hour day (midnight to midnight) among U.S. adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Hourly distribution of eating events in a 24 hour period (midnight to midnight) among U.S. adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. adults engaging in self-described breakfast (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. adults engaging in self-described lunch (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. adults engaging in self-described dinner (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. adults engaging in self-described snacks, including beverage-only events (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Time (hour of the day) in which self-described meals and snacks including beverage events are consumed in a 24 hour period (midnight to midnight) among U.S. adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Distribution of meal patterns (number of self-described meals and snacks) among U.S. adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Proportion of daily food group and subgroup intake by eating event type among U.S. adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Proportion of daily nutrient intake by eating event type among U.S. adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016, limited to nutrients of public health concern

Older Adults (70 years and older)

Distribution of eating event frequency in a 24 hour day (midnight to midnight) among U.S. older adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Hourly distribution of eating events in a 24 hour period (midnight to midnight) among U.S. older adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. older adults engaging in self-described breakfast (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. older adults engaging in self-described lunch (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. older adults engaging in self-described dinner (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Percent of U.S. older adults engaging in self-described snacks, including beverage-only events (and Spanish language equivalents) by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Time (hour of the day) in which self-described meals and snacks including beverage events are consumed in a 24 hour period (midnight to midnight) among U.S. older adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Distribution of meal patterns (number of self-described meals and snacks) among U.S. older adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Proportion of daily food group and subgroup intake by eating event type among U.S. older adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016

Proportion of daily nutrient intake by eating event type among U.S. older adults by age and sex, race-ethnicity, and income; WWEIA, NHANES, 2015-2016, limited to nutrients of public health concern

ANALYSIS RESULTS

This protocol will be updated with the links to the methods and results for each analysis used to describe the relationship between eating frequency and achieving food group and nutrient recommendations after the analytic plan has been finalized and implemented.