

WHAT IS THE RELATIONSHIP BETWEEN BEVERAGE CONSUMPTION¹ 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 beverage consumption 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 the relationship between beverage consumption and achieving nutrient and food group recommendations.
- 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.

¹ Alcohol is a part of total beverage consumption that will be addressed in a separate protocol “What is the relationship between alcohol consumption and achieving nutrient and food group recommendations?”

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 beverage consumption and achieving nutrient and food group recommendations?

Note: Alcohol is a part of total beverage consumption that will be addressed in a separate protocol “What is the relationship between alcohol consumption and achieving nutrients and food group recommendations?”

Beverage category contributions to food groups and nutrients

- Average contribution of food group and nutrients per 8 oz of each discrete beverage type

The following are also a part of the analytic framework for the question: *describe and evaluate current dietary patterns and beverages.*

- Beverage contribution as a percent of total daily energy and selected nutrients and food groups
 - Energy (and percent of energy from macronutrients)
 - Macro/Micro nutrients, limited to nutrients of public health concern
 - Other food components: e.g. added sugars, caffeine
- Percent of daily beverage calories by discrete beverage type
- Consumption prevalence of cow’s milk and milk alternative beverages
- Prevalence of nutritionally fortified beverages consumption

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

Life stages:

- Infants and toddlers (birth to <24 months)
- Children and adolescents (ages 2-19 years)
- Adults (ages 20-64 years)
- Pregnant women (ages 20-44 years) self-reported pregnancy status and/or positive urinary pregnancy test.
- Lactating women (ages 20-44 years)
- Older adults (ages 65 years and older)

Note: Exceptions to age groupings will be specified.

Demographic subgroups:

- Sex
 - Race-ethnicity
 - Socioeconomic status (e.g. income, education)
 - Food security status
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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).
For analyses looking at change in dietary intake over time: the WWEIA 2003-2004 cycle will serve as the years for comparison, with exceptions noted to these data years.

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.

Beverage pattern – The quantities, proportions, variety or combinations of different beverages in diets.

Discrete beverage groups –

- Milk: Plain and flavored milk, other dairy drinks and milk substitutes (Excludes milk or milk substitutes added to alcoholic beverages, coffee, tea, and/or foods such as cereal)
- 100% Juice: 100% fruit and/or vegetable juice.
- Coffee/tea: Regular and decaffeinated coffee or tea with additions such as milk, cream and/or sweeteners, and coffee and tea drinks, including ready-to-drink.
- Diet beverages: Diet soft drinks, diet sport/energy drinks and other diet drinks that are low- and no-calorie-sweetened, containing 40 kcal or less per reference amount customarily consumed.
- Sweetened beverages: Energy containing soft drinks, fruit drinks, and sports/energy drinks with added sugars that contain more than 40 kcal per reference amount customarily consumed.
 - Soft drinks: Energy-containing drinks made with carbonated water.
 - Fruit drinks: Energy-containing fruit and/or vegetable drinks that are not 100% juice.
 - Sports/energy drinks: Energy-containing sport/energy drinks, nutritional beverages and protein/nutritional powders consumed with a beverage, smoothies and grain drinks.
- Water: Tap, bottled, flavored, carbonated and enhanced/fortified water containing < 5kcal.
- Alcoholic beverages: Beer, wine, liqueur and cocktails.

ANALYTIC PLAN

To describe the relationship between beverage consumption and achieving nutrient and food group recommendations in the U.S. population for each life-stage, analysis will quantify beverage intake patterns using WWEIA, NHANES dietary recall data and corresponding nutrient values from the USDA Food and Nutrient Database for Dietary Studies through the following analyses:

Contextual Analysis not specific to life stage

Food group and nutrient amounts per 8oz of beverage type

Nutrients limited to nutrients of public health concern as well as added sugars and caffeine

Birth to less than 24 months

Prevalence of intakes of cow's milk (plain and sweetened/flavored), calcium fortified soy (plain and sweetened/flavored), almond and other milk substitutes (e.g. almond beverage) among U.S. infants and toddlers ages 6<12 and 12<24 months using WWEIA, NHANES 2007-2016

Percent of mean daily energy and selected nutrient and food component intakes, excluding infant milk source, contributed by discrete beverage categories among U.S. infants and toddlers ages 6<12 and 12<24 months using WWEIA, NHANES 2007-2016

Nutrients and food components include: macronutrients, added sugars, nutrients identified to be of public health concern once defined, and caffeine

Percent of daily beverage calories, excluding infant milk source, by discrete beverage type among U.S. infants and toddlers ages 6<12 and 12<24 months, WWEIA, NHANES 2015-2016

Children (2-19 years)

Prevalence of nutritional beverage (e.g. pediatric fortified nutritional beverages) consumption among U.S. children by sex, race-ethnicity and family income WWEIA, NHANES 2015-2016

Prevalence consumed in addition to other foods and beverages during an eating event

Prevalence consumed as a beverage-only event

Prevalence of intakes of cow's milk (plain and sweetened/flavored), calcium fortified soy (plain and sweetened/flavored), almond and other milk substitutes (e.g. almond beverage) among U.S. children by age and sex, race-ethnicity and family income WWEIA, NHANES 2015-2016

The following analyses are also a part of the protocol: Describe and evaluate current dietary patterns and beverages.

Percent of mean daily energy and selected nutrient and food component intakes contributed by discrete beverage categories among U.S. children ages 2-19 years using WWEIA, NHANES 2015-2016

Nutrients and food components include: macronutrients, added sugars, nutrients identified to be of public health concern once defined, and caffeine

Percent of daily beverage calories by discrete beverage type among the U.S. children ages 2-19 years, WWEIA, NHANES 2015-2016

Adults (20 years and older)

Prevalence of nutritional beverage (e.g. fortified nutritional beverages) consumption among U.S. adults by sex, race-ethnicity and family income WWEIA, NHANES 2015-2016

Prevalence consumed in addition to other foods and beverages during an eating event

Prevalence consumed as a beverage-only event

Prevalence of intakes of cow's milk (plain and sweetened/flavored), calcium fortified soy (plain and sweetened/flavored), almond and other milk substitutes (e.g. almond beverage) among U.S. adults by age and sex, race-ethnicity and family income WWEIA, NHANES 2015-2016

The following analyses are also a part of the protocol for: Describe and evaluate current dietary patterns and beverages.

Percent of mean daily energy and selected nutrient and food component intakes contributed by discrete beverage categories among U.S. adults ages 20 years and older using WWEIA, NHANES 2015-2016

Nutrients and food components include: macronutrients, added sugars, nutrients identified to be of public health concern once defined, and caffeine

Percent of daily beverage calories by discrete beverage type among U.S. adults ages 20 years and older, WWEIA, NHANES 2015-2016

Pregnant Women

Prevalence of nutritional beverage (e.g. fortified nutritional beverages) consumption among pregnant women in the U.S. WWEIA, NHANES 2013-2016

Prevalence consumed in addition to other foods and beverages during an eating event

Prevalence consumed as a beverage-only event

Prevalence of intakes of cow's milk (plain and sweetened/flavored), calcium fortified soy (plain and sweetened/flavored), almond and other milk substitutes (e.g. almond beverage) among pregnant women in the U.S. WWEIA, NHANES 2013-2016

The following analyses are also a part of the protocol for: Describe and evaluate current dietary patterns and beverages.

Percent of mean daily energy and selected nutrient and food component intakes contributed by discrete beverage categories among pregnant women in the U.S. WWEIA, NHANES 2015-2016

Nutrients and food components include: macronutrients, added sugars, nutrients identified to be of public health concern once defined, and caffeine

Percent of daily beverage calories by discrete beverage type among the pregnant women in the U.S. WWEIA, NHANES 2013-2016

Lactating Women

Prevalence of nutritional beverage (e.g. fortified nutritional beverages) consumption among lactating women in the U.S. WWEIA, NHANES 2013-2016

Prevalence consumed in addition to other foods and beverages during an eating event

Prevalence consumed as a beverage-only event

Prevalence of intakes of cow's milk (plain and sweetened/flavored), calcium fortified soy (plain and sweetened/flavored), almond and other milk substitutes (e.g. almond beverage) among lactating women in the U.S. WWEIA, NHANES 2013-2016

The following analyses are also a part of the protocol for: Describe and evaluate current dietary patterns and beverages.

Percent of mean daily energy and selected nutrient and food component intakes contributed by discrete beverage categories among lactating women in the U.S. WWEIA, NHANES 2013-2016

Nutrients and food components include: macronutrients, added sugars, nutrients identified to be of public health concern once defined, and caffeine

Percent of daily beverage calories by discrete beverage type among lactating women in the U.S. WWEIA, NHANES 2013-2016

ANALYSIS RESULTS

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