DESCRIBE AND EVALUATE CURRENT DIETARY PATTERNS AND BEVERAGE CONSUMPTION: DATA ANALYSIS PROTOCOL

This document describes the protocol for data analysis to address the following question: Describe and evaluate current dietary patterns and beverage consumption.

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. 9) includes reports that describe the analytic methods and summarize results (e.g. data tables and figures)

This protocol is up-to-date as of: 09/19/2019.

This version of the protocol contains updates to the following sections. These changes do not reflect a substantive change in the intent or conduct of the analyses:

- The life stage for infants and toddlers is specified as birth to less than 24 months in the analytic framework.
- Specificity added to age groupings and population subgroups in the analytic plan.
- HEI scores will be compared between 2005-2006 and 2015-2016, exceptions will be noted.
- Added sugars and caffeine are specified as food components rather than nutrients.
- Individual nutrients contributed by beverages will not be specified until nutrients of public health concern have been defined.
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: Describe/evaluate current dietary patterns and beverage consumption.

Dietary patterns will be described and evaluated in the following ways:
- The Healthy Eating Index – 2015 (HEI-2015) will be used to assess eating patterns of Americans ages 2+
  - Average HEI-2015 total and components scores
  - Distribution of HEI-2015 scores
- Food category contributions to total energy intake by age, sex, race and income

Beverage consumption will be described and evaluated in the following ways:
- Types of beverages consumed and their contribution to total beverage consumption
- Percent of U.S. population consuming types of beverages on a given day
- Volume of beverages consumed on a given day
- Variations in beverage consumption by age-sex groups
- Variations in beverage consumption by race-ethnicity
- Variations in beverage consumption by income
- Percent of energy and nutrients from beverage types
  - Energy (and percent of energy from macronutrients)
  - Macro/Micro nutrients
  - Other food components: e.g. added sugars, caffeine

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 (20-44 years)
- Lactating women (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
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.

Reference amount customarily consumed (RACC) – The serving size listed on a Nutrition Facts Label is based on a reference amount of food that is customarily eaten at a single eating occasion as determined by the Food and Drug Administration.
## Analytic Plan

### Dietary Patterns

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

#### Birth to less than 24 months

*The analytic plan for infants and toddlers is still in discussion.*

<table>
<thead>
<tr>
<th>Children (2-19 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population average HEI-2015 total and component scores among U.S. Children ages 2-19 years, by sex, race-ethnicity and family income using WWEIA, NHANES 2015-2016</td>
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<td>Food category sources contribution to total energy intake among U.S. children ages 2-19 years, WWEIA, NHANES 2013-2016</td>
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<tr>
<td>Population usual intake distributions of total HEI-2015 scores among U.S. adults ages 20 years and older WWEIA, NHANES 2015-2016</td>
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<td>Changes in population average HEI-2015 scores among U.S. adults 20 years and older between WWEIA, NHANES 2005-2006 and 2015-2016</td>
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Question: Describe and evaluate current dietary patterns and beverage consumption.
Dietary Patterns (continued)

Lactating Women

- Population average HEI-2015 total and component scores among lactating women in the U.S. using WWEIA, NHANES 2013-2016
- Food category sources contribution to total energy intake among lactating women in the U.S. using WWEIA, NHANES 2013-2016
Beverage Consumption

To describe and evaluate current beverage consumption in the U.S. population for each life-stage, analysis will quantify intakes of beverage using WWEIA, NHANES dietary recall data and corresponding nutrient and food component values from the USDA Food and Nutrient Database for Dietary Studies through the following analyses:

**Birth to less than 24 months**

*The analytic plan for infants and toddlers is still in discussion.*

### Children (2-19 years)

- Percent of children (2-19 years) who consumed beverage types on a given day WWEIA, NHANES 2015-2016
- Sweetened beverage consumption by race and age among U.S. children ages 2-19 years, WWEIA, NHANES 2015-2016
- Mean daily beverage intake (fluid ounces) by beverage type among U.S. children ages 2-19 years using WWEIA, NHANES 2015-2016
- Percent of mean daily energy and selected nutrient and food component intakes contributed by beverages 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. population of children ages 2-19 years, WWEIA, NHANES 2015-2016

### Adults (20 years and older)

- Percent of adults (20 years and older) who consumed beverage types on a given day, by age and race-ethnicity WWEIA, NHANES 2015-2016
- Sweetened beverage consumption by race and age among U.S. adults ages 20 years and older, WWEIA, NHANES 2015-2016
- Mean daily beverage intake (fluid ounces) by beverage type among U.S. adults ages 20 years and older using WWEIA, NHANES 2015-2016
- Percent of mean daily energy and selected nutrient and food component intakes contributed by beverages among U.S. adults ages 20 years and older, by age and sex 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. population of adults ages 20 years and older, by age and sex, WWEIA, NHANES 2015-2016
### Beverage Consumption (continued)

#### Pregnant Women

- Percent of pregnant women who consumed beverage types on a given day WWEIA, NHANES 2013-2016
- Sweetened beverage consumption by race among U.S. pregnant women, WWEIA, NHANES 2013-2016
- Mean daily beverage intake (fluid ounces) by beverage type among U.S. pregnant women using WWEIA, NHANES 2013-2016
- Percent of mean daily energy and selected nutrient and food component intakes contributed by beverages among U.S. pregnant women using 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 the U.S. population of pregnant women, WWEIA, NHANES 2013-2016

#### Lactating Women

- Percent of lactating women who consumed beverage types on a given day WWEIA, NHANES 2013-2016
- Sweetened beverage consumption by race among U.S. lactating women, WWEIA, NHANES 2013-2016
- Mean daily beverage intake (fluid ounces) by beverage type among U.S. lactating women using WWEIA, NHANES 2013-2016
- Percent of mean daily energy and selected nutrient and food component intakes contributed by beverages among U.S. lactating women using 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 the U.S. population of lactating women, 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 and evaluate food group and nutrient intakes after the analytic plan has been finalized and implemented.