DESCRIBE AND EVALUATE CURRENT INTAKES OF FOOD GROUPS AND NUTRIENTS: DATA ANALYSIS PROTOCOL

This document describes the protocol for data analysis to address the following question: Describe and evaluate current intakes of food groups and nutrients.

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. 11) 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.

- This version of the protocol contains updates to the following sections. The key definitions, analytic framework and analytic plan now include the elements for infants and toddlers.
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 and evaluate current intakes of food groups and nutrients.

Food group intakes will be described and evaluated in the following ways:
- Mean intakes of food groups and subgroups
- Prevalence of reported food groups and subgroups for infants and toddlers (ages birth <24 months)
- Usual intake distributions of food groups and subgroups
- Food category sources of food group intakes
- Current food group intakes compared to existing food group recommendations
- Changes in food group intakes over time

Nutrient intakes will be described and evaluated in the following ways:
- Mean intakes of nutrients from foods and beverages
- Mean intakes of nutrients from foods, beverages and dietary supplements
- Usual intake distribution of nutrients from foods and beverage
- Usual intake distribution of nutrients from foods, beverages and dietary supplements
- Current nutrient intakes from foods and beverage compared to Dietary Reference Intakes
- Food category sources of nutrient intakes, limited to nutrients of public health concern
- Changes in nutrient intakes over time, limited to nutrients of public health concern

**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
- Lactating Women
- Older Adults (ages 65 years and older)

**NOTE:** Exceptions to age groupings will be specified.

**Demographic subgroups:**
- Sex
- Race-ethnicity
- Indicators of socioeconomic status

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1 USDA Food Patterns Summary Table, 2015-2020 Dietary Guidelines for Americans: https://fns-prod.azureedge.net/sites/default/files/usda_food_patterns/USDAFoodPatternsSummaryTable.pdf

2 National Academies of Science Engineering and Medicine, Health and Medicine Division Dietary Reference Intakes: https://www.ncbi.nlm.nih.gov/books/NBK222890/

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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. Exceptions to these data years will be noted.

Data Source:
National Immunization Survey; cross-sectional, nationally representative survey that includes data on breastfeeding initiation and duration.

Data Years:
Data collected in 2017-2018 will be used to determine national estimates of breastfeeding initiation and duration.

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
Human milk – Mother’s own milk provided at the breast (i.e., nursing) or expressed and fed fresh or after refrigeration/ freezing; donor milk is not examined in this review
Human milk feeding – Feeding human milk alone or in combination with infant formula and/or complementary foods and beverages (CFB), such as cow’s milk
Exclusive human milk feeding – Feeding human milk alone and not in combination with infant formula and/or CFB such as cow’s milk; inclusive of WHO definitions of “exclusive” and “predominant” breastfeeding, which permit limited quantities of drops or syrups containing vitamins, minerals, or medicines; water and water-based drinks such as sweetened water and teas; fruit juice; oral rehydration salts solution; and ritual fluids
Infant formula – Commercially prepared infant formula meeting FDA and/or Codex Alimentarius international food standards
Mixed feeding – Feeding human milk and infant formula but not CFB such as cow’s milk
Complementary foods and beverages (CFB) – Foods and beverages other than human milk or infant formula (liquids, semisolids, and solids) provided to an infant or young child to provide nutrients and energy
ANALYTIC PLAN

Food Group Intakes

The following analyses will be used to describe and evaluate current food group intakes in the U.S. population for each life-stage:

Birth to less than 24 months

Population average intakes of food groups and subgroups from complementary foods and beverages among U.S. Children ages 6<12 and 12<24 months, total and stratified by infant milk source (i.e. human milk and/or infant formula) using WWEIA, NHANES 2007-2016

Prevalence of reported food group and subgroup intakes among U.S. Children ages 6<12 and 12<24 months, total and stratified by infant milk source (i.e. human milk and/or infant formula) using WWEIA, NHANES 2007-2016

Food category sources of food groups and subgroups from complementary foods and beverages among U.S. Children ages 6<12 and 12<24 months, total and stratified by infant milk source (i.e. human milk and/or infant formula) using WWEIA, NHANES 2007-2016

Breast feeding initiation and duration among infants in the U.S. National Immunization Survey 2017-2018

Children (2-19 years)

Population average intakes of food groups and subgroups among U.S. Children ages 2-19 years using WWEIA, NHANES, 2015-2016

- by Sex and Age
- by Race/Ethnicity and Age
- by Family Income in Dollars and Age
- by Family Income as % of Poverty Level and Age

Population usual intake distributions of food groups and subgroups among U.S. Children ages 2-19 years using WWEIA, NHANES 2013-2016

- by Sex and Age

Percent of the U.S. population of children (ages 2-19 years) that meets food group recommendations in the currently available USDA Food Patterns using WWEIA, NHANES 2013-2016

- by Sex and Age

Changes in average food group intakes among U.S. Children ages 2-19 years between WWEIA, NHANES 2003-2004 and 2015-2016

WWEIA Food Category Sources of food group intakes among U.S. Children ages 2-19 years, WWEIA, NHANES 2013-2016

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Adults (20-64 years)

Population average intakes of food groups and subgroups among U.S. Adults ages 20-69 years using WWEIA, NHANES, 2015-2016

- by Sex and Age
- by Race/Ethnicity and Age
- by Family Income in Dollars and Age
- by Family Income as % of Poverty Level and Age

Population usual intake distributions of food groups and subgroups among U.S. Adults ages 20-70 years using WWEIA, NHANES 2013-2016

- by Sex and Age

Percent of the U.S. population of adults (ages 20-70 years) that meets food group recommendations in the currently available USDA Food Patterns using WWEIA, NHANES 2013-2016

- by Sex and Age

Changes in average food group intakes among U.S. Adults ages 20-64 years between WWEIA, NHANES 2003-2004 and 2015-2016

WWEIA Food Category Sources of food group intakes among U.S. Adults ages 20-71 years, WWEIA, NHANES 2013-2015

Older Adults (65 years and older)

Population average intakes of food groups and subgroups among U.S. Older Adults ages 70 years and older using WWEIA, NHANES, 2015-2016

- by Sex and Age
- by Race/Ethnicity and Age
- by Family Income in Dollars and Age
- by Family Income as % of Poverty Level and Age

Population usual intake distributions of food groups and subgroups among U.S. Older Adults ages 71 years and older using WWEIA, NHANES 2013-2016

- by Sex and Age

Percent of the U.S. population of Older Adults ages 71 years and older that meets food group recommendations in the currently available USDA Food Patterns using WWEIA, NHANES 2013-2016

- by Sex and Age

Changes in average food group intakes among U.S. older adults ages 65 years and older between WWEIA, NHANES 2003-2004 and 2015-2016

WWEIA Food Category Sources of food group intakes among U.S. Older Adults ages 71 years and older, WWEIA, NHANES 2013-2015

Pregnant Women

Population average intakes of food groups and subgroups among pregnant women in the U.S. using WWEIA, NHANES, 2015-2016

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Population usual intake distributions of food groups and subgroups among pregnant women in the U.S. using WWEIA, NHANES 2013-2016

Changes in average food group intakes among pregnant women in the U.S. between WWEIA, NHANES 2003-2004 and 2015-2016

WWEIA Food Category Sources of food group intakes among pregnant women in the U.S. using WWEIA, NHANES 2013-2016

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**Lactating Women**

Population average intakes of food groups and subgroups among lactating women in the U.S. using WWEIA, NHANES, 2013-2016

Population usual intake distributions of food groups and subgroups among lactating women in the U.S. using WWEIA, NHANES 2013-2016

Changes in average food group intakes among lactating women in the U.S. between WWEIA, NHANES 2003-2004 and 2015-2016

WWEIA Food Category Sources of food group intakes among lactating women in the U.S. using WWEIA, NHANES 2013-2016
Nutrient Intakes

To describe and evaluate current nutrient intakes in the U.S. population for each life-stage, analysis will quantify intakes of nutrients from 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:

Infants 6 to less than 24 months

Population average nutrient intakes from complementary food and beverages among U.S. children ages 6<12 months and 12<24 months, total and stratified by infant milk source (i.e. human milk and/or infant formula), using WWEIA, NHANES 2007-2016

Population total usual nutrient intake distributions from infant milk source, food and beverages among U.S. children ages 6<12 months, total and stratified by infant milk source (i.e. human milk and/or infant formula), using WWEIA, NHANES 2007-2016

Comparison of total estimated nutrient intakes to DRIs among U.S. children ages 6<12 months by infant milk source using WWEIA, NHANES 2007-2016

Food category sources of nutrients/food components, among U.S. Children ages 6<12 months and 12<24 months, total and stratified by infant milk source (i.e. human milk and/or infant formula) using WWEIA, NHANES 2007-2016
Children ages 1-18 years

Population average nutrient intakes from food and beverage among U.S. Children ages 1-18 years using WWEIA, NHANES 2015-2016
- by Sex and Age
- by Race/Ethnicity and Age
- by Family Income in Dollars and Age
- by Family Income as % of Poverty Level and Age

Population average nutrient intakes from food and beverage and dietary supplements among U.S. Children ages 1-18 years using WWEIA, NHANES 2015-2016
- by Sex and Age

Population usual nutrient intake distributions from food and beverage among U.S. Children ages 1-18 years using WWEIA, NHANES 2013-2016
- by Race/Ethnicity and Age
- by Family Income as % of Poverty Level and Age

Population usual nutrient intake distributions from food and beverage and dietary supplements among U.S. Children ages 1-18 years using WWEIA, NHANES 2013-2016
- by Sex and Age

Comparison of nutrient intakes in the U.S. population of children ages 1-18 years to Dietary Reference Intakes
- by Sex and Age

Changes in population average intakes of nutrients from foods and beverages between 2009-2010 and 2015-2016 among U.S. Children ages 1-18 years, limited to nutrients of public health concern
- by Sex and Age

WWEIA Food Category Sources of nutrients among U.S. Children ages 1-18 years, WWEIA, NHANES 2013-2016, limited to nutrients of public health concern
- by Sex and Age
Adults and Older Adults ages 19 years and older³

Population average nutrient intakes from food and beverage among U.S. Adults ages 20 years and older using WWEIA, NHANES 2015-2016
- by Sex and Age
- by Race/Ethnicity and Age
- by Family Income in Dollars and Age
- by Family Income as % of Poverty Level and Age

Population average nutrient intakes from food and beverage and dietary supplements among U.S. Adults ages 20 years and older using WWEIA, NHANES 2015-2016
- by Sex and Age

Population usual nutrient intake distributions from food and beverage among U.S. Adults ages 19 years and older using WWEIA, NHANES 2013-2016
- by Sex and Age

Population usual nutrient intake distributions from food and beverage and dietary supplements among U.S. Adults ages 19 years and older using WWEIA, NHANES 2013-2016
- by Sex and Age

Comparison of nutrient intakes in the U.S. population of adults ages 19 years and older to Dietary Reference Intakes
- by Sex and Age

Changes in population average nutrient intake from foods and beverages between 2009-2010 and 2015-2016 among U.S. Adults ages 20 years and older, limited to nutrients of public health concern
- by Sex and Age

WWEIA Food Category Sources of nutrients among U.S. Adults ages 19 years and older, WWEIA, NHANES 2013-2016, limited to nutrients of public health concern
- by Sex and Age

³ Due to age grouping differences by NHANES sampling driven age groups and the age-sex groups used in the Dietary Reference intakes, adults and older adults are presented together. The ages grouping for each analysis are noted.

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### Pregnant Women
- Population average nutrient intakes from food and beverage among pregnant women in the U.S. using WWEIA, NHANES 2013-2016
- Population average nutrient intakes from food and beverage and dietary supplements among pregnant women in the U.S. using WWEIA, NHANES 2013-2016
- Population usual nutrient intake distributions from food and beverage among pregnant women in the U.S. using WWEIA, NHANES 2013-2016
- Population usual nutrient intake distributions from food and beverage and dietary supplements among pregnant women in the U.S. using WWEIA, NHANES 2013-2016
- Comparison of nutrient intakes in the U.S. population of pregnant women to Dietary Reference Intakes
- WWEIA Food Category Sources of nutrients among pregnant women in the U.S., WWEIA, NHANES 2013-2016, limited to nutrients of public health concern

### Lactating Women
- Population average nutrient intakes from food and beverage among lactating women in the U.S. using WWEIA, NHANES 2013-2016
- Population average nutrient intakes from food and beverage and dietary supplements among lactating women in the U.S. using WWEIA, NHANES 2013-2016
- Population usual nutrient intake distributions from food and beverage among lactating women in the U.S. using WWEIA, NHANES 2013-2016
- Population usual nutrient intake distributions from food and beverage and dietary supplements among lactating women in the U.S. using WWEIA, NHANES 2013-2016
- Comparison of nutrient intakes in the U.S. population of lactating women to Dietary Reference Intakes
- WWEIA Food Category Sources of nutrients among lactating women in the U.S., WWEIA, NHANES 2013-2016, 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 and evaluate food group and nutrient intakes after the analytic plan has been finalized and implemented.