

# 2020 Dietary Guidelines Advisory Committee: DRAFT - Part D. Chapter 12: Added Sugars

*Members Involved in Drafting this Chapter:*

**Elizabeth Mayer-Davis**



Heather Leidy

Richard Mattes

Timothy Naimi

Rachel Novotny

Barbara Schneeman

This chapter includes questions examined by the Beverages and Added Sugars Subcommittee  
and the Data Analysis and Food Pattern Modeling Working Group

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# LIST OF QUESTIONS & METHODOLOGY

1. What is the relationship between added sugars consumption and achieving nutrient and food group recommendations?
  - Answered using data analyses
2. What is the relationship between added sugars consumption and risk of cardiovascular disease?
  - Answered using a NESR systematic review
3. How much added sugars can be accommodated in a healthy diet while still meeting food group and nutrient needs?
  - Answered using food pattern modeling

**Final protocols and draft conclusion statements available at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov)  
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# QUESTION 1: ADDED SUGARS AND ACHIEVING FOOD AND NUTRIENT RECOMMENDATIONS: DATA ANALYSIS

Federal data were reviewed for infancy through older adults

- Reflected the most current NHANES cycle available
- Earlier cycles were used to compare changes in added sugars consumption over time

Main findings:

- In the U.S. population ages 1 and older, mean usual consumption of added sugars was **13%** of daily energy intake in 2013-2016
- The estimated proportion of the population that met the guidance to consume less than 10% of energy from added sugars has **increased** from 30% in 2007-2010 to 37% in 2013-2016
- Nearly 70 percent of added sugars intake comes from 5 food categories:
  - sweetened beverages
  - candy and sugars
  - desserts and sweet snacks
  - breakfast cereals and bars
  - coffee and tea (with their additions)

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# QUESTION 2: ADDED SUGARS AND CVD: REVIEW OF THE SCIENCE

## What is the relationship between added sugars consumption and risk of cardiovascular disease?

- Answered using a NESR systematic review of literature published September 2012—September 2019
- 2015 Committee examined literature January 2000—August 2012
- 23 articles (3 in children; 20 in adults), representing 20 studies were included
  - Most of the studies examined were prospective cohort studies, although this review also included some randomized controlled trials
- **Limited** evidence of a relationship between greater consumption of added sugars and increased risk of cardiovascular disease mortality (8 studies)
  - Most of these studies were based primarily on SSB
- **Insufficient** evidence in children to answer this question (3 studies)
- **Insufficient** evidence in adults for: CVD risk profile (6 studies), ischemic cardiovascular events (3 studies), peripheral artery disease (2 studies), stroke (1 study), or heart failure (1 study)

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# QUESTION 3: ACCOMODATING ADDED SUGARS: FOOD PATTERN MODELING EXERCISE 1

*Estimating the number of calories in the base USDA Food Patterns that can be used for added sugars*

## **Methods**

- Identify the amount of essential calories in the base USDA Food Patterns
- Assign the remaining calories exclusively to solid fats and added sugars

## **Definitions and Assumptions:**

- The base USDA Food Patterns are constructed using nutrient-dense representative foods that contain low or no saturated fat, added sugars, and sodium.
- “Essential calories” is the energy associated with the foods and beverages ingested to meet nutritional goals through choices that align with the USDA Food Patterns in forms with the least amounts of saturated fat, added sugars, and sodium.

# QUESTION 3: ACCOMODATING ADDED SUGARS: FOOD PATTERN MODELING EXERCISE 1 (1 of 3)

Essential Calories and Limit on Solid Fats and Added Sugars Across Calorie Levels in the Base USDA Food Patterns for Ages 2 Years and Older

Calories	Essential Calories <sup>1</sup>	Percent Essential Calories <sup>1</sup>	Calorie Limit for Solid Fats and Added Sugars <sup>2</sup>	Calories Assigned to Solid Fats <sup>3</sup>	Calories Assigned to Added Sugars <sup>3</sup>	Grams of Solid Fats <sup>4</sup>	Grams of Added Sugars <sup>4</sup>	Percent Calories Added Sugars
Level	kcal	% kcal	kcal	kcal	kcal	g	g	%
1,000	872	87	128	70	57	8	14	6
1,200	1127	94	73	40	33	5	8	3
1,400	1318	94	82	45	37	5	9	3
1,600	1505	94	95	52	43	6	11	3
1,800	1665	93	135	74	61	9	15	3
2,000	1770	88	230	127	104	15	26	5
2,200	1960	89	240	132	108	16	27	5
2,400	2094	87	306	168	138	20	34	6
2,600	2265	87	335	184	151	22	38	6
2,800	2446	87	354	195	159	23	40	6
3,000	2574	85	426	235	192	28	48	6
3,200	2635	82	565	311	254	37	64	8

<sup>1</sup> Calories in pattern if all foods are consumed in nutrient-dense forms, without additional solid fats or added sugars

<sup>2</sup> Calculated from pattern calorie level minus essential calories

<sup>3</sup> Calculated as 55 percent of calories from solid fats and 45 percent from added sugars, based on mean population intakes 2013-2016

<sup>4</sup> Calculated using caloric values of 8.4 kcal per 1 gram of solid fats and 4 kcal per 1 gram of added sugars

# QUESTION 3: ACCOMODATING ADDED SUGARS: FOOD PATTERN MODELING EXERCISE 1 (2 of 3)

Essential Calories and Limit on Solid Fats and Added Sugars Across Calorie Levels in the Base USDA Food Patterns for Ages 2 Years and Older

Calories	Essential Calories <sup>1</sup>	Percent Essential Calories <sup>1</sup>	Calorie Limit for Solid Fats and Added Sugars <sup>2</sup>	Calories Assigned to Solid Fats <sup>3</sup>	Calories Assigned to Added Sugars <sup>3</sup>	Grams of Solid Fats <sup>4</sup>	Grams of Added Sugars <sup>4</sup>	Percent Calories Added Sugars
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# QUESTION 3: ACCOMODATING ADDED SUGARS: FOOD PATTERN MODELING EXERCISE 1 (3 of 3)

Essential Calories and Limit on Solid Fats and Added Sugars Across Calorie Levels in the Base USDA Food Patterns for Ages 2 Years and Older

Calories Level	Essential Calories <sup>1</sup> kcal	Percent Essential Calories <sup>1</sup> % kcal	Calorie Limit for Solid Fats and Added Sugars <sup>2</sup> kcal	Calories Assigned to Solid Fats <sup>3</sup> kcal	Calories Assigned to Added Sugars <sup>3</sup> kcal	Grams of Solid Fats <sup>4</sup> g	Grams of Added Sugars <sup>4</sup> g	Percent Calories Added Sugars %
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# QUESTION 3: ACCOMODATING ADDED SUGARS: FOOD PATTERN MODELING EXERCISE 1- Conclusion Statement

- Energy required to meet food group and nutrient needs using nutrient-dense foods:
  - $\geq 85\%$  more of total energy across most energy levels
- Assuming the remaining energy is distributed exclusively to solid fats and added sugars according to population-level proportional intakes:
  - $\leq 6\%$  additional calories available for the consumption of added sugars for most energy levels
  - $\leq 8\%$  additional calories would be available for only the highest energy level analyzed (3,200 calories/day)
- These scenarios assume:
  - individuals consume only recommended amounts of nutrient-dense foods and beverages and no calories from alcohol

# QUESTION 3: REDISTRIBUTING ADDED SUGARS: FOOD PATTERN MODELING EXERCISE 2

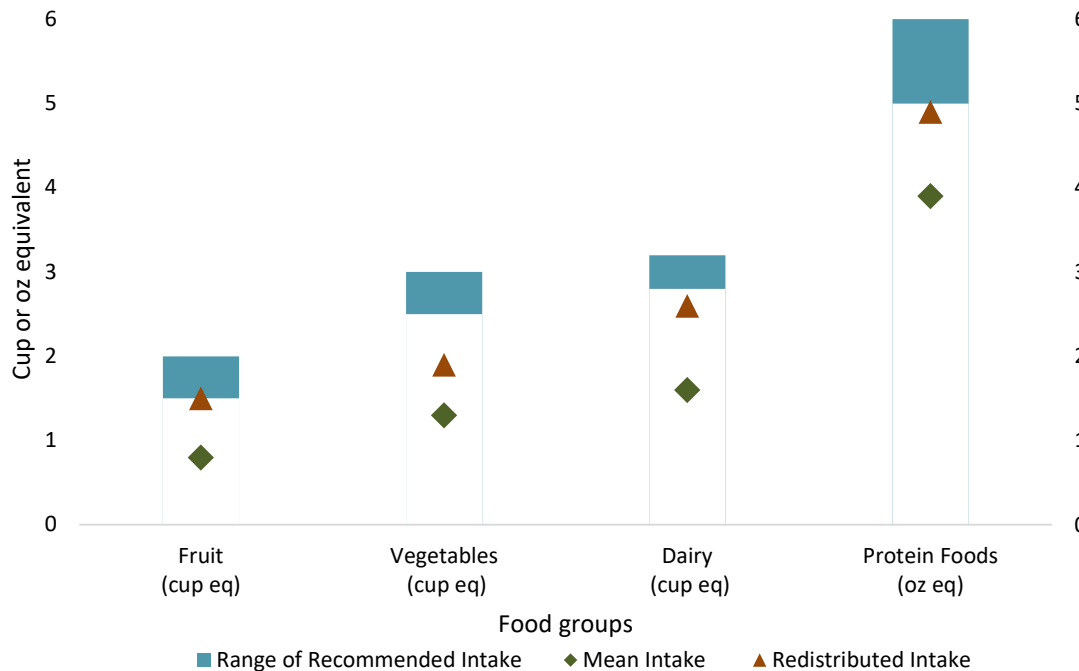
*Redistributing calories from the top reported sources of added sugars to foods and beverages that achieve food group and nutrient goals*

## **Methods (for each age-sex group)**

- Calculate calories from the 5 top contributing food/beverage sources of added sugars
- Quantify current mean intakes across the 5 food groups and identify those under-consumed
- Reassign calories from food/beverage sources of added sugars to increase intake of under-consumed food groups

# QUESTION 3: REDISTRIBUTING ADDED SUGARS: FOOD PATTERN MODELING EXERCISE 2 (1 of 3)

Recommended and Mean Intakes of Food Groups with Improvement from Reallocation of Energy from Sources of Added Sugars\*  
Females 14-18 years of age



Theoretical Improvement in Nutrient Intake with Reallocation of Energy from Sources of Added Sugars\* to Nutrient-Dense Fruits, Vegetables, Dairy, and Protein Foods  
Females 14-18 years of age

Nutrient	Nutritional Goal	Contribution from Reallocation of Energy from Sources of Added Sugars
Calcium	1,300 mg	490 mg
Iron	15 mg	2 mg
Potassium	4700 mg	1178 mg
Protein	46 g	18 g

**217 Calories Redistributed**

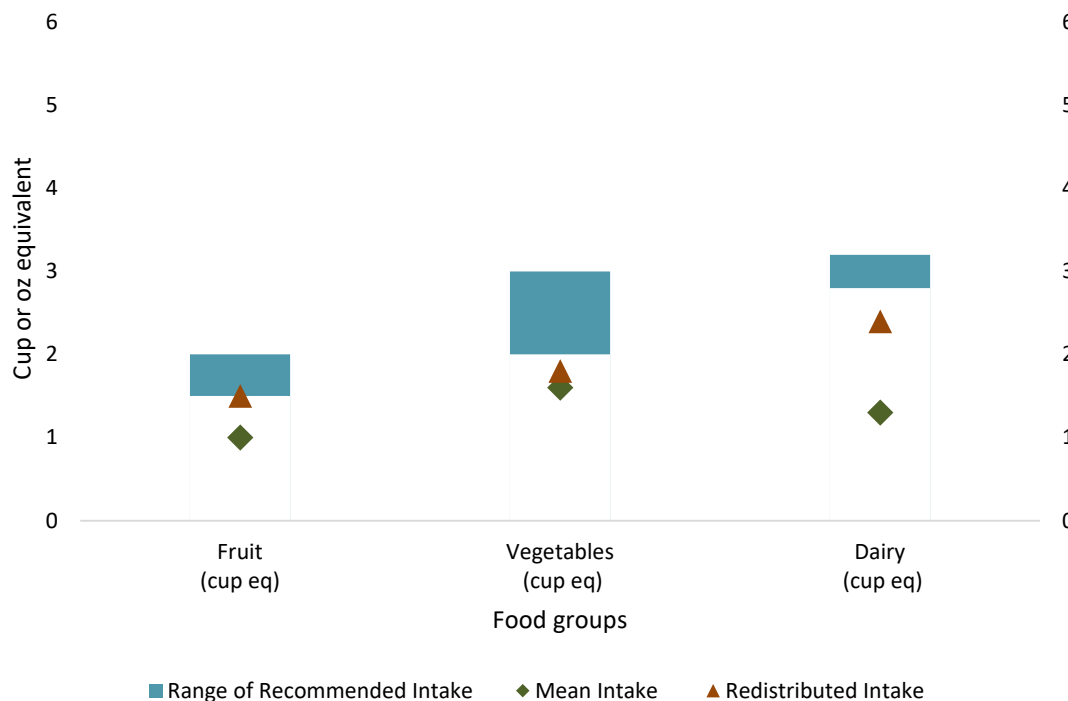
\*The analyses assume energy is redistributed to nutrient-dense food choices low in added sugars, solid fat, and sodium

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Redistributing calories from the top reported sources of added sugars  
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# QUESTION 3: REDISTRIBUTING ADDED SUGARS: FOOD PATTERN MODELING EXERCISE 2 (2 of 3)

Recommended and Mean Intakes of Food Groups with Improvement from Reallocation of Energy from Sources of Added Sugars\*  
Females 51-70 years of age



Theoretical Improvement in Nutrient Intake with Reallocation of Energy from Sources of Added Sugars to Nutrient-Dense Fruits, Vegetables, Dairy and Protein Foods  
*Females 51-70 years of age*

Nutrient	Nutritional Goal	Contribution from Reallocation of Energy from Sources of Added Sugars
Calcium	1,200 mg	350 mg
Fiber	22.4 g	2 g
Potassium	4700 mg	480 mg
Vitamin B12	2.4 mcg	1.0 mcg

**205 Calories  
Redistributed**

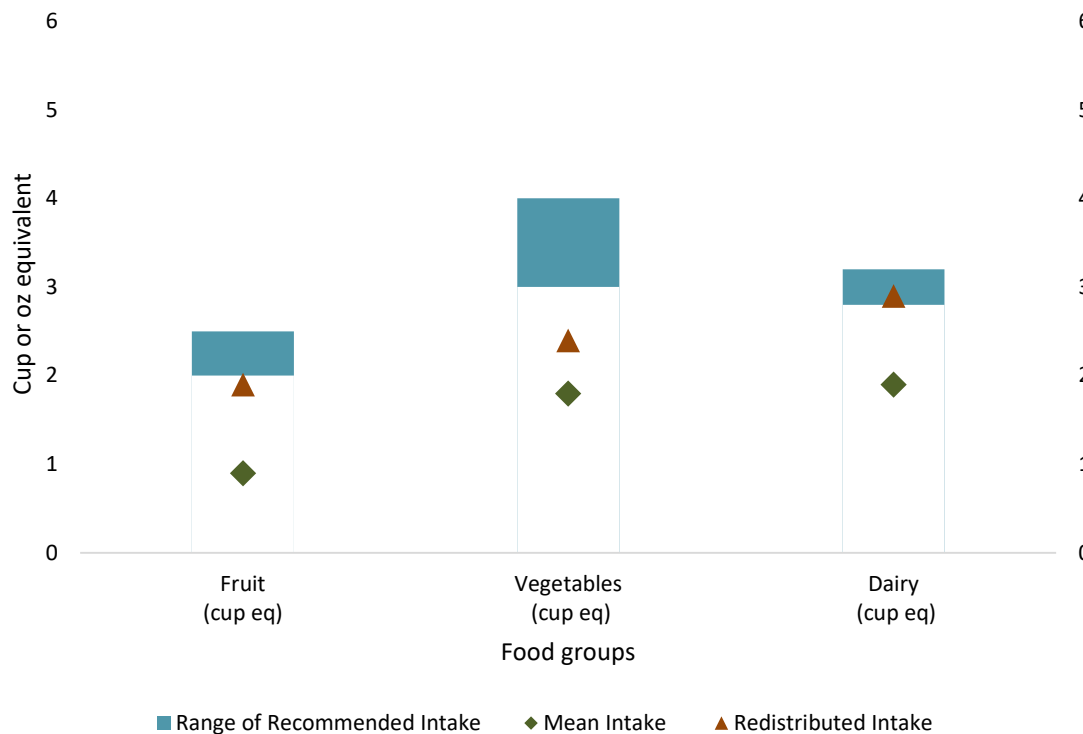
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**Redistributing calories from the top reported sources of added sugars  
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# QUESTION 3: REDISTRIBUTING ADDED SUGARS: FOOD PATTERN MODELING EXERCISE 2 (3 of 3)

Recommended and Mean Intakes of Food Groups with Improvement from Reallocation of Energy from Sources of Added Sugars\*  
Males 31-50 years of age



Theoretical Improvement in Nutrient Intake with Reallocation of Energy from Sources of Added Sugars to Nutrient-Dense Fruits, Vegetables, Dairy and Protein Foods

Males 31-50 years of age

Nutrient	Nutritional Goal	Contribution from Reallocation of Energy from Sources of Added Sugars
Calcium	1,000 mg	349 mg
Fiber	25.2 g	5.3 g
Potassium	4700 mg	862 mg

**230 Calories Redistributed**

\*The analyses assume energy is redistributed to nutrient-dense food choices low in added sugars, solid fat and sodium

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Redistributing calories from the top reported sources of added sugars  
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# QUESTION 3: REDISTRIBUTING ADDED SUGARS: FOOD PATTERN MODELING

## EXERCISE 2 – Conclusion Statement

- 5 food categories contribute the majority of added sugars in the U.S. population and
  - Often energy-dense foods with low amounts of key dietary nutrients
- Redistributing energy from these 5 food categories to underconsumed food groups and nutrients
  - Could have a significant positive impact on overall diet quality and nutrient status
  - Age-sex groups could better meet food group recommendations for fruits, vegetables, and dairy
  - Could also increase consumption of key nutrients contained in these food groups

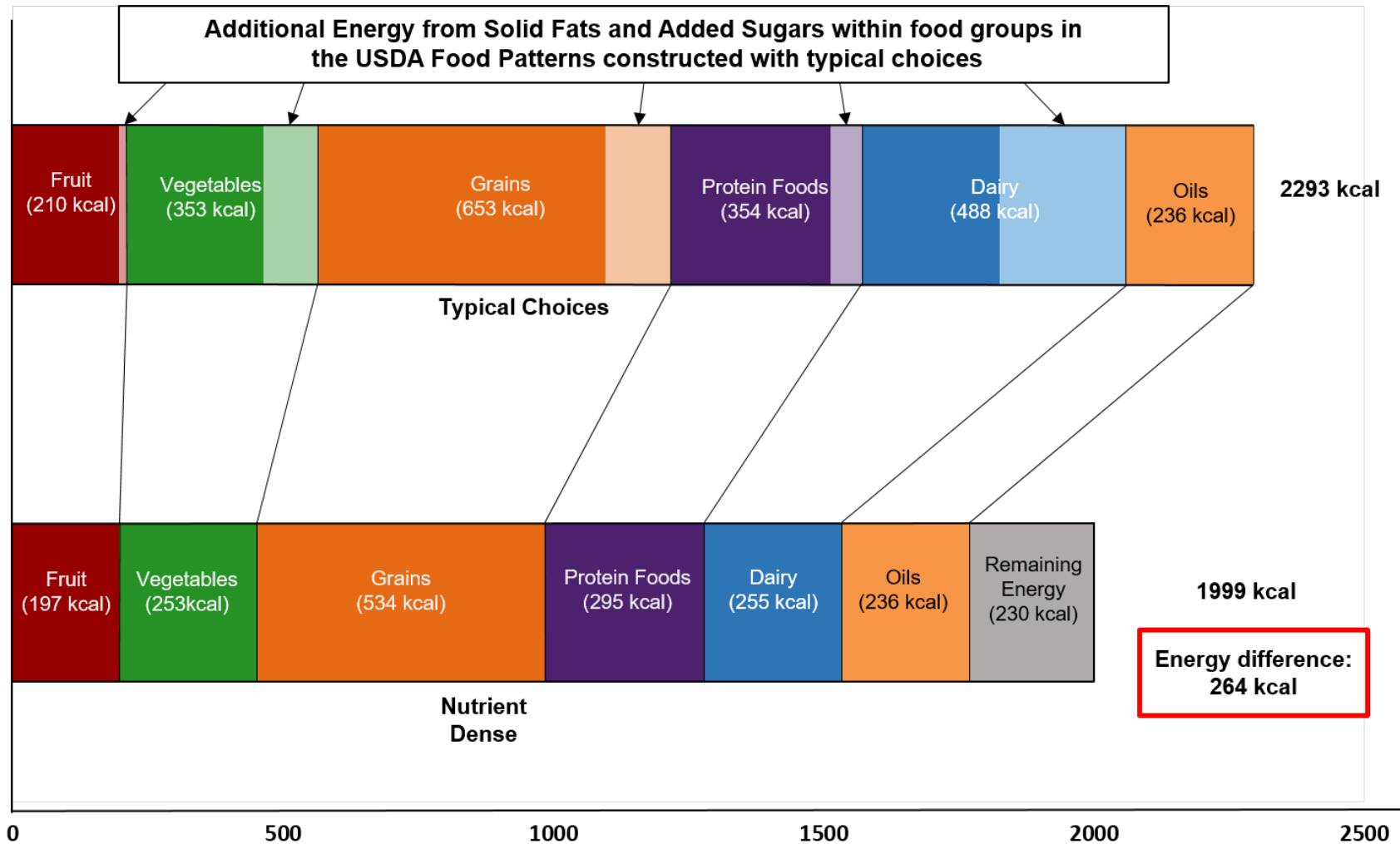
# QUESTION 3: TYPICAL CHOICES ANALYSIS: FOOD PATTERN MODELING EXERCISE 3

Estimating excess calories from added sugars when USDA Food Patterns are met with typical vs nutrient-dense choices

## Methods

- Calculate the USDA Food Patterns with typical rather than nutrient-dense choices
- Identify the contribution of added sugars to total energy in the USDA Food Patterns constructed with typical choices

# QUESTION 3: TYPICAL CHOICES ANALYSIS: FOOD PATTERN MODELING EXERCISE 3





# QUESTION 3: TYPICAL CHOICES ANALYSIS: FOOD PATTERN MODELING EXERCISE 3 – Conclusion Statement

- When the USDA Food Patterns are constructed with typical choices rather than nutrient-dense foods, the contribution of added sugars to total energy increases.
- If consumers eat the recommended quantities from each food group or subgroup, but do not choose nutrient-dense foods lower in added sugars, total energy will exceed daily needs.

# DISCUSSION

- A high proportion of total energy is accounted for by added sugars
- The totality of the evidence suggests limiting the consumption of added sugars to, at most, very low amounts
- Limitations within the available body of evidence should be considered:
  - Challenges in exposure assessment
    - Most studies focus on SSBs
  - Limited observational studies assessing intake over time
  - Limited RCTs
- Recent systematic reviews and meta-analyses provide additional supporting evidence of adverse effects of added sugars, particularly SSB, that may contribute to unhealthy weight-gain and obesity-related health outcomes

# SUMMARY: Draft Evidence-Based Advice to USDA and HHS

- The *2015-2020 Dietary Guidelines for Americans* recommended consumption of added sugars be limited to 10% or less of total energy intake
- The prevalence of overweight and obesity is high and added sugars provide energy, generally without contributing additional nutrient content
- Based on updated analyses of dietary intake, model-based estimations of discretionary calories available for added sugars, and evidence for the potential health impacts, this Committee suggests:

*Less than 6% of energy from added sugars is more consistent with a dietary pattern that is nutritionally adequate while avoiding excess energy intake than is a pattern with less than 10% of energy from added sugars*

- Reducing the amount of added sugars in the diet, through changes in consumer behavior, how food is produced and sold, and food policies, is an achievable objective that could improve population health

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# DRAFT - Part D. Chapter 12: Added Sugars

## USDA/HHS Staff Who Supported this Chapter



### **Support Staff:**

Meghan Adler

Charlotte Bahnfleth

Claire Brown

Gisela Butera

Natasha Cole

Janet de Jesus

Brittany Kingshipp

Kristin Koegel

Kevin Kuczynski

Emily Madan

Julie Obaggy

Richard Olson

TusaRebecca Pannucci

Julia Quam

Anne Rodgers

Jenna Seymour

Maureen Spill

Eve Essery Stoody

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# 2020 Dietary Guidelines Advisory Committee: DRAFT - Part D. Chapter 12: Added Sugars



Barbara Schneeman, PhD  
University of California-  
Davis  
*Chair*



Ronald Kleinman, MD\*  
Harvard Medical School  
*Vice Chair*



Jamy Ard, MD  
Wake Forest School of  
Medicine



Regan Bailey, PhD, MPH, RD  
Purdue University



Lydia Bazzano, MD, PhD  
Tulane University



Carol Boushey, PhD, MPH, RD  
University of Hawaii



Teresa Davis, PhD  
Baylor College of  
Medicine



Kathryn Dewey, PhD  
University of California-Davis



Sharon Donovan, PhD, RD  
University of Illinois



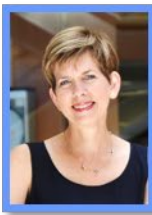
Steven Heymsfield, MD  
Louisiana State University



Heather Leidy, PhD  
University of Texas



Richard Mattes, PhD, MPH, RD  
Purdue University



Elizabeth Mayer-Davis, PhD, RD  
University of North Carolina



Timothy Naimi, MD, MPH  
Boston University



Rachel Novotny, PhD, RDN, LD  
University of Hawaii



Joan Sabaté, DrPH, MD  
Loma Linda University



Linda Snetselaar, PhD, RD  
University of Iowa



Jamie Stang, PhD, MPH, RDN  
University of Minnesota



Elsie Taveras, MD, MPH\*  
Harvard University



Linda Van Horn, PhD, RDN, LD  
Northwestern University

\*Massachusetts General Hospital

 Remote attendance

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