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Objectives

• Overview of the Dietary Guidelines Advisory Committee (DGAC) Recommendations and subsequent guidelines
• Summary of the National Heart, Lung, and Blood Institute’s Nutrition section of the Pediatric Expert Panel development of the Integrated Guidelines for Cardiovascular Health and Risk Reduction
• Current research findings and applications
• Future needs
Colorado
# High Blood Pressure

*Healthy Adults*

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td>16.2%</td>
<td>3/50</td>
<td>16.2%</td>
<td>Utah</td>
<td>14.7%</td>
<td>16%</td>
</tr>
</tbody>
</table>

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**Adults with hypertension in Colorado**

- 2001: 15.7%
- 2002: 17.7%
- 2003: 16.7%
- 2005: 15.5%
- 2007: 16.2%

**Adults with hypertension by gender in Colorado**

- Male: 18.6%
- Female: 13.8%

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Diabetes
Healthy Adults

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>4.5%</td>
<td>5/50</td>
<td>4.5%</td>
<td>Minnesota</td>
<td>4.1%</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Obesity
Healthy Children

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2%</td>
<td>23/50</td>
<td>14.2%</td>
<td>Oregon</td>
<td>9.6%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Obese children in Colorado

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>9.9%</td>
</tr>
<tr>
<td>2007</td>
<td>14.2%</td>
</tr>
</tbody>
</table>

Obese children by race/ethnicity in Colorado

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>7.6%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>25.3%</td>
</tr>
</tbody>
</table>

Prevalence of overweight and obesity combined (BMI ≥25) for adults aged 20 years and older: NHANES 2009-2010

<table>
<thead>
<tr>
<th>All Race/Ethnicity Groups</th>
<th>Non-Hispanic White</th>
<th>Non-Hispanic Black</th>
<th>Hispanic</th>
<th>Mexican American</th>
</tr>
</thead>
<tbody>
<tr>
<td>% (95% CI)</td>
<td>69.2 (66.3-71.9)</td>
<td>68.0 (64.5-71.3)</td>
<td>76.6 (72.8-80.0)</td>
<td>77.3 (74.3-80.0)</td>
</tr>
<tr>
<td>Age adjusted ≥20 y</td>
<td>68.8 (65.9-71.5)</td>
<td>66.7 (63.1-70.2)</td>
<td>76.7 (73.3-79.7)</td>
<td>78.8 (76.2-81.3)</td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥20 y</td>
<td>74.1 (70.0-77.8)</td>
<td>75.0 (70.1-79.4)</td>
<td>69.9 (66.0-73.5)</td>
<td>79.9 (75.5-83.7)</td>
</tr>
<tr>
<td>Age adjusted ≥20 y</td>
<td>73.9 (70.0-77.5)</td>
<td>74.0 (69.2-78.3)</td>
<td>69.9 (66.4-73.3)</td>
<td>81.7 (77.8-85.0)</td>
</tr>
<tr>
<td>20-39 y</td>
<td>67.1 (61.2-72.6)</td>
<td>65.0 (57.1-72.2)</td>
<td>64.5 (57.6-70.9)</td>
<td>74.5 (67.7-80.2)</td>
</tr>
<tr>
<td>40-59 y</td>
<td>70.5 (73.8-84.2)</td>
<td>80.8 (73.2-86.6)</td>
<td>75.8 (68.3-82.0)</td>
<td>86.3 (82.9-89.1)</td>
</tr>
<tr>
<td>≥60 y</td>
<td>76.5 (72.1-80.4)</td>
<td>78.6 (75.1-81.8)</td>
<td>76.8 (63.7-75.3)</td>
<td>86.6 (79.7-91.5)</td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥20 y</td>
<td>64.5 (61.8-67.1)</td>
<td>61.3 (57.8-64.7)</td>
<td>82.1 (77.5-86.0)</td>
<td>74.4 (71.0-77.5)</td>
</tr>
<tr>
<td>Age adjusted ≥20 y</td>
<td>63.7 (60.9-66.4)</td>
<td>59.5 (55.5-63.3)</td>
<td>82.1 (77.9-85.6)</td>
<td>75.7 (72.6-78.6)</td>
</tr>
<tr>
<td>20-39 y</td>
<td>55.8 (49.6-61.0)</td>
<td>50.7 (43.1-58.2)</td>
<td>74.2 (65.0-81.1)</td>
<td>65.4 (50.9-70.5)</td>
</tr>
<tr>
<td>40-59 y</td>
<td>66.0 (61.0-69.8)</td>
<td>61.3 (55.0-66.5)</td>
<td>87.7 (80.8-92.4)</td>
<td>83.3 (79.4-86.5)</td>
</tr>
<tr>
<td>≥60 y</td>
<td>73.5 (70.4-76.4)</td>
<td>71.6 (66.1-74.9)</td>
<td>86.4 (77.9-92.0)</td>
<td>81.2 (77.9-84.1)</td>
</tr>
</tbody>
</table>

Abbreviations: BMI, body mass index; NHANES, National Health and Nutrition Examination Survey.

*Includes race/ethnicity groups not shown separately.
*b Includes Mexican American participants.
*C Calculated as weight in kilograms divided by height in meters squared.
*d Age adjusted by the direct method to the year 2000 Census population using the age groups 20-39 years, 40-59 years, and 60 years and older.
Prevalence of obese (BMI ≥30) for adults aged 20 years and older: NHANES 2009-2010

Table 2. Prevalence of Obesity (BMI ≥30) and of Overweight and Obesity Combined (BMI ≥25) for Adults Aged 20 Years and Older: NHANES 2009-2010

<table>
<thead>
<tr>
<th>Race/Ethnicity Groups</th>
<th>% (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
</tr>
<tr>
<td>Body Mass Index ≥30</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>35.0 (34.0-37.9)</td>
</tr>
<tr>
<td>Age adjusted ≥20 y</td>
<td>35.7 (33.8-37.7)</td>
</tr>
</tbody>
</table>

Men

<table>
<thead>
<tr>
<th>Age (y)</th>
<th>All</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥20</td>
<td>35.5 (32.0-39.2)</td>
<td>36.4 (32.1-40.9)</td>
<td>33.4 (30.3-36.6)</td>
</tr>
<tr>
<td>Age adjusted ≥20 y</td>
<td>35.5 (31.9-39.2)</td>
<td>36.2 (31.8-40.8)</td>
<td>33.4 (30.3-36.6)</td>
</tr>
<tr>
<td>20-39 y</td>
<td>33.2 (27.7-39.2)</td>
<td>34.5 (27.3-42.6)</td>
<td>34.5 (29.4-40.6)</td>
</tr>
<tr>
<td>40-59 y</td>
<td>37.2 (33.4-41.2)</td>
<td>37.4 (33.0-42.0)</td>
<td>37.8 (30.4-45.8)</td>
</tr>
<tr>
<td>≥60 y</td>
<td>36.6 (31.7-41.8)</td>
<td>37.1 (31.1-43.4)</td>
<td>37.8 (30.4-45.8)</td>
</tr>
</tbody>
</table>

Women

<table>
<thead>
<tr>
<th>Age (y)</th>
<th>All</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥20</td>
<td>35.8 (34.0-37.7)</td>
<td>32.2 (29.2-35.3)</td>
<td>58.6 (52.5-64.5)</td>
</tr>
<tr>
<td>Age adjusted ≥20 y</td>
<td>35.8 (34.0-37.7)</td>
<td>32.2 (29.2-35.3)</td>
<td>58.6 (52.5-64.5)</td>
</tr>
<tr>
<td>20-39 y</td>
<td>31.9 (28.6-35.5)</td>
<td>26.9 (23.0-31.3)</td>
<td>56.2 (44.3-67.5)</td>
</tr>
<tr>
<td>40-59 y</td>
<td>36.0 (32.5-39.6)</td>
<td>31.8 (27.2-38.7)</td>
<td>62.7 (55.0-69.8)</td>
</tr>
<tr>
<td>≥60 y</td>
<td>42.3 (38.3-46.3)</td>
<td>41.8 (37.7-46.3)</td>
<td>55.5 (47.6-63.1)</td>
</tr>
</tbody>
</table>
What are the Dietary Guidelines?

- 1st published in 1980
- Federal nutrition policy established jointly by USDA & HHS
- Updated every 5 years
- Provide science-based advice for ages 2 and over to help prevent chronic disease & promote health
- Foundation for Federal nutrition programs, nutrition education programs, and a basis for research gaps and priorities
- Ensure that messages and materials are consistent throughout the Federal government and that government speaks with “one nutrition voice”
- Policy used by educators, health professionals, policy makers – for consumers
Report of the
Dietary Guidelines
Advisory Committee
on the
Dietary Guidelines for
Americans, 2010
## Changes over time of select measures of the US food retail and food service environment

<table>
<thead>
<tr>
<th>Food environment measure</th>
<th>Time Frame</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of commercial eating places (^1)</td>
<td>1972-1995</td>
<td>89%</td>
</tr>
<tr>
<td>Number of fast food restaurants(^1)</td>
<td>1972-1995</td>
<td>147%</td>
</tr>
<tr>
<td>Percentage of meals and snacks eaten at restaurants (non-fast food) (^2)</td>
<td>1977-1995</td>
<td>150%</td>
</tr>
<tr>
<td>Percentage of meals and snacks eaten at fast food restaurants (^2)</td>
<td>1977-1995</td>
<td>200%</td>
</tr>
<tr>
<td>Food At Home expenditures by families and individuals as a share of disposable income (% of income) (^4)</td>
<td>1970-2008</td>
<td>-42%</td>
</tr>
<tr>
<td>Food Away from Home as a share of food expenditures (^5)</td>
<td>1970-2008</td>
<td>45%</td>
</tr>
<tr>
<td>Share of daily caloric intake from food away from home (^6)</td>
<td>1977-78 to 1994-96</td>
<td>77%</td>
</tr>
</tbody>
</table>
What We Eat vs. Recommended Limits

![Pie charts comparing what we eat to recommended limits for calories from solid fats and added sugars vs. nutrient-dense foods.]

Note: The depiction of the percent of the amount of total calories consumed and the recommended limits are illustrative only.
<table>
<thead>
<tr>
<th>Prepregnancy BMI Category</th>
<th>Total Weight Gain (lb)</th>
<th>Rate of Weight Gain 2nd and 3rd Trimester (lb/wk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight (&lt; 18.5 kg/m²)</td>
<td>28-40</td>
<td>1.0 (1.0-1.3)</td>
</tr>
<tr>
<td>Normal-weight (18.5-24.9 kg/m²)</td>
<td>25-35</td>
<td>1.0 (0.8-1.0)</td>
</tr>
<tr>
<td>Overweight (25.0-29.9 kg/m²)</td>
<td>15-25</td>
<td>0.6 (0.5-0.7)</td>
</tr>
<tr>
<td>Obese (≥ 30.0 kg/m²)</td>
<td>11-20</td>
<td>0.5 (0.4-0.6)</td>
</tr>
</tbody>
</table>

*Calculations assume a first-trimester weight gain of 1.1-4.4 lb (0.5-2.0 kg)
Distribution of GWG relative to 1990 guidelines by prepregnancy BMI category (PRAMS, 2002-03)

Body mass index category (IOM criteria)

- Underweight
  - < IOM: 30.6%
  - Within IOM: 49.9%
  - > IOM: 19.5%

- Normal weight
  - < IOM: 20.5%
  - Within IOM: 41.1%
  - > IOM: 38.4%

- Overweight
  - < IOM: 10.3%
  - Within IOM: 26.8%
  - > IOM: 63%

- Obese
  - < IOM: 23.5%
  - Within IOM: 30.2%
  - > IOM: 36.3%

Proportion (%) of women

50% 59% 73% 70%
Maternal Weight Gain - IOM

IOM Weight Gain Guidelines, 2009

- Improve approaches to prevent obesity preconception
- Avoid excessive gestational weight gain
- Provide guidance to return to proper weight gain between pregnancies
- Disseminate Gestational Weight Gain guidelines
- Encourage breastfeeding for both mother’s health and baby’s
What is the relationship between breastfeeding and maternal postpartum weight change?

(Literature searched: 1990-2010)

Conclusions:

Moderate evidence:

- Breastfeeding may be associated with maternal postpartum weight loss.
- Weight loss is small, transient and depends on breastfeeding intensity and duration.
USDA Nutrition Evidence Library

• Evidence-based systematic review preferred foundation for policy and guidance
• NEL established to synthesize evidence to inform nutrition policy and programs
  – Dietary Guidelines Advisory Committee resource
  – Implementation of Dietary Guidelines for Americans
• Ensures compliance with Data Quality Act
• Expert workgroup is a critical element in the approach
Total Diet

Key Topics:
- Overweight/obese nation
- Develop healthy dietary patterns in childhood and adolescence
- Maintain energy intake within calorie needs
- Maximize nutrient density by emphasizing whole grains, vegetables, fruits, milk/milk products, and oils
- Reduce solid fats and added sugars (SoFAS) and sodium
- Flexible eating patterns
Translating and Integrating the Evidence

High priority findings:

1) Shift to more plant-based diets with vegetables, dry beans, fruits, whole grains, nuts, seafood, low/no fat dairy, lean meat, poultry

2) Reduce incidence/prevalence of overweight and obesity by reducing energy intake and increasing physical activity

3) Reduce foods high in excess added sugars and solid fats, refined grains, sodium

4) Meet the 2008 Physical Activity Guidelines
Urgent Need to Focus on Children

Strategies:
- Improve foods sold and served in and around schools:
  - Remove sugar-sweetened beverages and high calorie snacks
  - Emphasize responsible zoning for fast food restaurants
- Develop effective policies on food marketing to children
- Increase comprehensive health, nutrition, and physical education programs
- Develop standardized approaches for health care providers to track BMI in children and weight gain during and after pregnancy
- Reduce children’s screen time (TV and computer)
- Increase safe routes to schools and recreation areas
- Support summer programs that emphasize good health
Childhood Adiposity

Dietary intakes associated with adiposity in children?

Conclusions:

Strong evidence:
- Sugar sweetened beverages associated with adiposity

Moderately strong evidence:
- Positive association between total caloric intake and adiposity
  (Literature searched: 2000-2009)
- Positive association between energy density and adiposity
  (Literature searched: 1980-2009)
- Greater intake in total fat associated with greater adiposity*

*no studies done under isocaloric conditions
Childhood Adiposity

Conclusions continued:

Moderate evidence:

Limited evidence:
- 100% fruit juice associated only in children who are overweight (Searched: NEL: 2004-2009 + ADA: 1982-2004)

Insufficient evidence: to determine the association between dietary fiber and adiposity (Searched: 1980-2009)
Dietary Guidelines for Americans
History 1980 – 2010
Dietary Guidelines, 2010

Development Process

Phase 1: Dietary Guidelines Advisory Committee

• 13 member Advisory Committee from academia and medical institutions
  – High credentialed and experienced in public health

• Systematic evidence-based review methodology for 130 scientific questions

• Consistent and transparent process

• Data analyses, food pattern modeling analyses, and reviews of existing evidence-based reports

• Public comments received and reviewed throughout

• 445-page advisory report provided scientific basis
Dietary Guidelines, 2010

Development Process

Phase 2: Review of and comment on DGAC Report

- Public comments
  - 1159 written comments posted to public comments database between June 15 through July 15, 2010
  - 50 organizations and individuals provided oral testimony on July 8, 2010
  - Staff reviewed and considered all public comments in development of policy document
  - All comments available at www.dietaryguidelines.gov for public view

- USDA and HHS agency review for program-specific policy implications
Dietary Guidelines, 2010
Development Process

Phase 3: Drafting and review of DGA

• Writing team formed
  – USDA and HHS nutritionists -- most worked closely with DGAC in developing their Report
  – Structure for DGA followed the four main integrated findings identified in Report’s Translation and Integration Chapter

• Reviews of drafts included
  – USDA and HHS Agency review for policy implications
  – Independent peer review for compliance with Quality of Information Act for clarity, technical accuracy, and consistency with Advisory Report
  – Clearance by Departments in December 2010
Dietary Guidelines, 2010
at a Glance

- Executive Summary
- Chapter 1. Introduction
- Chapter 2. Balancing Calories to Manage Weight
- Chapter 3. Foods and Food Components to Reduce
- Chapter 4. Foods and Nutrients to Increase
- Chapter 5. Building Healthy Eating Patterns
- Chapter 6. Helping Americans Make Healthy Choices
- Appendices
Dietary Guidelines, 2010
Executive Summary

- Describes purpose, uses, and major concepts
- Includes individuals at high risk of chronic disease new
- Identifies two overarching concepts new
  - Maintain calorie balance over time to achieve and sustain a healthy weight
  - Focus on consuming nutrient-dense foods and beverages
- Lists all Key Recommendations
Chapter 1
Introduction

In 1980, the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (HHS) released the first edition of Nutrition and Your Health: Dietary Guidelines for Americans. These Dietary Guidelines were different from previous dietary guidance in that they reflected emerging scientific evidence about diet and health and expanded the traditional focus on nutrient adequacy to also address the impact of diet on chronic disease.

Subsequent editions of the Dietary Guidelines for Americans have been remarkably consistent in their recommendations about the components of a health-promoting diet, but they also have changed in some significant ways to reflect an evolving body of evidence about nutrition, the food and physical activity environment, and health. The ultimate goal of the Dietary Guidelines for Americans is to improve the health of our Nation’s current and future generations by facilitating and promoting healthy eating and physical activity choices so that these behaviors become the norm among all individuals.

The recommendations contained in the Dietary Guidelines for Americans traditionally have been intended for healthy Americans ages 2 years and older. However, Dietary Guidelines for Americans, 2010 is being released at a time of rising concern about the health of the American population. Its recommendations accommodate the reality that a large percentage of Americans are overweight or obese and/or at risk of various chronic diseases. Therefore, the Dietary Guidelines for Americans, 2010 is intended for Americans ages 2 years and older, including those who are at increased risk of chronic disease.

Poor diet and physical inactivity are the most important factors contributing to an epidemic of overweight and obesity in this country. The most recent data indicate that 72 percent of men and 64 percent of women are overweight or obese, with about one-third of adults being obese. Even in the absence of overweight, poor diet and physical inactivity are associated with major causes of morbidity and mortality. These include cardiovascular disease, hypertension,
Chapter 1
Introduction

- Describes 2010 Dietary Guidelines development
- Identifies their uses
- Explains their importance for health promotion and disease prevention
  - Highlights the heavy toll of diet-related diseases
- Provides a “roadmap” to the rest of the document
  - Explains strength of the evidence
  - Defines several key terms
Key term definition

“Nutrient Dense”

Nutrient-dense foods and beverages:

- Provide vitamins, minerals, and other beneficial substances and relatively few calories without
  - Solid fats in the food or added to it
  - Added sugars
  - Added refined starches
  - Added sodium
- Retain naturally occurring components, such as dietary fiber
- All vegetables, fruits, whole grains, seafood, eggs, beans and peas, unsalted nuts and seeds, fat-free and low-fat dairy, and lean meats and poultry are nutrient dense when prepared without solid fats or sugars
**Nutrient Dense and Non-Nutrient Dense Forms of Sample Foods**

**FIGURE 5-2. Examples of the Calories in Food Choices That Are Not in Nutrient Dense Forms and the Calories in Nutrient Dense Forms of These Foods**

<table>
<thead>
<tr>
<th>Food</th>
<th>Calories in nutrient-dense form of the food</th>
<th>Additional calories in food as consumed</th>
<th>Total Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra lean ground beef</td>
<td>184</td>
<td>52</td>
<td>236 total</td>
</tr>
<tr>
<td>patty (90% lean) cooked 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ounces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baked chicken breast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breading and frying fat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breaded fried chicken strips</td>
<td>138</td>
<td>108</td>
<td>246 total</td>
</tr>
<tr>
<td>3 ounces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn flakes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Added sugars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frosted corn flakes cereal</td>
<td>90</td>
<td>57</td>
<td>147 total</td>
</tr>
<tr>
<td>1 cup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baked potato</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frying fat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curly french fried potatoes</td>
<td>117</td>
<td>141</td>
<td>258 total</td>
</tr>
<tr>
<td>1 cup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsweetened applesauce</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Added sugars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweetened applesauce</td>
<td>105</td>
<td>68</td>
<td>173 total</td>
</tr>
<tr>
<td>1 cup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fat-free milk</td>
<td>83</td>
<td>66</td>
<td>149 total</td>
</tr>
<tr>
<td>1 cup</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole milk</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calories in food as consumed: 0 to 300
Food Pattern Modeling

- Important for “filling the gaps” in evidence
- Used intake data (NHANES) and nutrient composition databases
- Identifies impact on nutrient adequacy of making specific changes in food or dietary pattern (e.g., vegetarian patterns)
- Essential in demonstrating what is “doable” for the American public (e.g., alternatives to milk)
- Highlights issues of the food environment that should change to support shifts in intake (e.g., sodium)
- Meld together issues such as dietary sources and fortification (e.g., folic acid)

(See Appendix E-3 in DGAC Report)
Chapter 2
Balancing Calories to Manage Weight

Achieving and sustaining appropriate body weight across the lifespan is vital to maintaining good health and quality of life. Many behavioral, environmental, and genetic factors have been shown to affect a person’s body weight. Calorie balance over time is the key to weight management. Calorie balance refers to the relationship between calories consumed from foods and beverages and calories expended in normal body functions (i.e., metabolic processes) and through physical activity. People cannot control the calories expended in metabolic processes, but they can control what they eat and drink, as well as how many calories they use in physical activity.

Calories consumed must equal calories expended for a person to maintain the same body weight. Consuming more calories than expended will result in weight gain. Conversely, consuming fewer calories than expended will result in weight loss. This can be achieved over time by eating fewer calories, being more physically active, or, best of all, a combination of the two.

Maintaining a healthy body weight and preventing excess weight gain throughout the lifespan are highly preferable to losing weight after weight gain. Once a person becomes obese, reducing body weight back to a healthy range requires significant effort over a span of time, even years. People who are most successful at losing weight and keeping it off do so through continued attention to calorie balance.

The current high rates of overweight and obesity among virtually all subgroups of the population in the United States demonstrate that many Americans are in calorie imbalance—that is, they consume more calories than they expend. To curb the obesity epidemic and improve their health, Americans need to make significant efforts to decrease the total number of calories they consume from foods and beverages and increase calorie expenditure through physical activity.

FOR MORE INFORMATION
See Chapter 3 for discussion of healthy eating patterns that meet nutrient needs within calorie limits.
Chapter 2
Balancing Calories to Manage Weight

- Epidemic of overweight and obesity in all segments of our society *new*
  - Environmental factors contribute to weight gain
- Calorie balance over time is key
- Important modifiable factors
  - Calories consumed in foods and beverages
  - Calories expended in physical activity
- Strong evidence for no optimal proportion of macronutrients for weight loss
Top Sources of Calories
Among Americans 2 Years and Older

1. Grain-based desserts
   - Cake, cookies, pie, cobbler, sweet rolls, pastries, and donuts
2. Yeast breads
   - White bread and rolls, mixed-grain bread, flavored bread, whole-wheat bread, and bagels
3. Chicken and chicken mixed dishes
   - Fried and baked chicken parts, chicken strips/patties, stir-fries, casseroles, sandwiches, salads, and other chicken mixed dishes
4. Soda/energy/sports drinks
   - Sodas, energy drinks, sports drinks, and sweetened bottled water including vitamin water
5. Pizza

Source: NHANES 2005-2006,
Available at http://riskfactor.cancer.gov/diet/foodsources/
Top Sources of Calories by Age Group

- Alcoholic beverages are a major calorie source for adults
- Sodas and pizza contribute more calories among adolescents than younger children
- Fluid milk is a top calorie source for younger children
Principles for Promoting Calorie Balance

- Monitor food and beverage intake, physical activity, and body weight
- Reduce portion sizes
- When eating out, make better choices
- Limit screen time
Chapter 2
Balancing Calories to Manage Weight

Key Recommendations

Prevent and/or reduce overweight and obesity through improved eating and physical activity behaviors.

Control total calorie intake to manage body weight. For people who are overweight or obese, this will mean consuming fewer calories from foods and beverages.

Increase physical activity and reduce time spent in sedentary behaviors.

Maintain appropriate calorie balance during each stage of life—childhood, adolescence, adulthood, pregnancy and breastfeeding, and older age.
Food Sources of Saturated Fats

FIGURE 3-4. Sources of Saturated Fat in the Diets of the U.S. Population Ages 2 Years and Older, NHANES 2005–2006a
Saturated Fatty Acids (SFA)

What is the effect of saturated fatty acid (SFA) intake on increased risk of CVD or T2D?

Conclusions:

**Strong evidence:**

- Positive association with increased total and LDL cholesterol and CVD risk (Literature searched: 2004-2009)
- Positive association with increased markers of insulin resistance and T2D risk (Literature searched: 2000-2009)
- Isocaloric replacement of SFA with MUFA/PUFA decreases CVD and T2D risk (Literature searched: 2000-2009)

Recommendations:

- Consume <10%, goal to gradually reduce to <7% of energy intake
Chapter 3
Foods and Food Components to Reduce

Calories from solid fats and added sugars *new*

- Reduce intake of calories from solid fats and added sugars (SoFAS)
- SoFAS provide 35% of calories
  - Do not contribute nutrients
- Only 5 to 15% of calories from SoFAS can be accommodated in healthy diets
Monounsaturated Fatty Acids (MUFA)

What is the effect of monounsaturated fatty acid (MUFA) intake on increased risk of CVD or T2D? (Literature searched: 2004-2009)

Conclusions:

**Strong evidence:**
- Dietary MUFA are associated with improved blood lipids related to both CVD and T2D, when MUFA replaces dietary SFA.
- 5 percent energy replacement of SFA with MUFA decreases intermediate markers and the risk of CVD and T2D in healthy adults; improves insulin responsiveness in insulin resistant and T2D individuals.

What is the effect of replacing a high carbohydrate diet with a high MUFA diet in persons with T2D?

Conclusions:

**Moderate evidence:**
- Increased MUFA intake, rather than high carbohydrate intake, may be beneficial for persons with T2D.
- High MUFA intake, when replacing a high carbohydrate intake, results in improved biomarkers of glucose tolerance and diabetic control.

Recommendations:
- At the current level of 11-12% energy from SFA, healthy adults would benefit by replacing 5% of that total energy with MUFA.
Polyunsaturated Fatty Acids (PUFA)

What is the effect of polyunsaturated fatty acid (PUFA) intake on increased risk of CVD or T2D? (Literature Searched: 2004-2009)

Conclusions:

**Strong evidence:**

- Dietary PUFA are associated with improved blood lipids related to CVD, in particular when PUFA is a replacement for dietary SFA or trans fatty acids.
- Energy replacement of SFA with PUFA decreases total cholesterol, LDL cholesterol and triglycerides, as well as numerous markers of inflammation.
- PUFA intake significantly decreases risk of CVD and also shown to decrease risk of T2D.

Recommendations:

- Increase PUFA or MUFA to substitute for 5% energy from SFA.
Chapter 3
Foods and Food Components to Reduce

Topics covered

– Sodium
– Fats
  – Saturated fatty acids
  – Trans fatty acids
  – Cholesterol
– Calories from solid fats and added sugars
– Refined grains
– Alcohol
What is the relationship between sodium intake and blood pressure in adults? (Literature searched: 2004-2009)

Conclusions:

**Strong evidence:**
As sodium intake decreases, blood pressure decreases.

Recommendation:
- Reduce sodium intake
Sodium and Blood Pressure in Children: Background

- Blood pressure in childhood tracks in adulthood
- Blood pressures in US children have increased in the past two decades.
  - Increased by 1.4 mmHg SBP
  - Increased by 3.3 mmHg DBP
- Elevated blood pressure in childhood is:
  - accompanied by elevated left ventricular hypertrophy (LVH)
  - associated with premature atherosclerosis CVD
Sodium and Blood Pressure in Children

What is the effect of a reduced sodium intake on blood pressure in children? (Literature searched: 1970-2009)

Conclusions:

Moderate evidence:
- Sodium reduction modestly lowers blood pressure in children
- Infancy may be especially sensitive; rationale for promoting breastfeeding
- More studies are needed
Chapter 3
Foods and Food Components to Reduce

Sodium

- Reduce intake to less than 2300 mg per day
- Further reduce intake to 1500 mg per day for
  - Adults ages 51+
  - African Americans ages 2+
  - People ages 2+ with high blood pressure, diabetes, or chronic kidney disease
- The 1500 mg recommendation applies to half the total population (ages 2+) and to the majority of adults
- Immediate, deliberate reduction in sodium content of foods is needed.
FIGURE 3-1. Estimated Mean Daily Sodium Intake, by Age-Gender Group, NHANES 2005-2006

- Males
- Females

- 2,300 mg
- 1,500 mg

Milligrams per day vs Age (years): 2-5, 6-11, 12-19, 20-29, 30-39, 40-49, 50-59, 60-69, >70
Food Sources of Sodium

FIGURE 3-2. Sources of Sodium in the Diets of the U.S. Population Ages 2 Years and Older, NHANES 2005–2006

[Diagram showing the percentage contributions of various food categories to sodium intake]

- Yeast breads: 7.3%
- Chicken and chicken mixed dishes: 6.8%
- Pizza: 6.3%
- Pasta and pasta dishes: 5.1%
- Cold cuts: 4.5%
- Condiments: 4.4%
- Tortillas, burritos, tacos: 4.1%
- Sausage, franks, bacon, ribs: 4.1%
- Soups: 3.3%
- Grain-based desserts: 3.4%
- Beef and beef mixed dishes: 3.3%
- Rice and rice mixed dishes: 2.6%
- Ready-to-eat cereals: 2.0%
- Salad dressing: 2.4%
- Burgers: 2.4%
- All other food categories: 31.9%
Fatty Acid Profiles of Fats and Oils

FIGURE 3-3. Fatty Acid Profiles of Common Fats and Oils
Chapter 3
Foods and Food Components to Reduce

Refined grains

• Limit consumption of refined grains, especially those that contain solid fats, added sugars, and sodium *new*
• Enriched refined grain products provide some vitamins and minerals, but not the fiber provided by whole grains
• Replace refined grains with whole grains
Food Sources of Refined Grains

FIGURE 3-7. Sources of Refined Grains in the Diets of the U.S. Population Ages 2 Years and Older, NHANES 2003-2004

- Yeast breads 25.9%
- Grain-based desserts 9.9%
- Tortillas, burritos, tacos 8.0%
- Pasta and pasta dishes 6.7%
- Chicken and chicken mixed dishes 4.4%
- Rice and rice mixed dishes 4.4%
- Quickbreads 3.4%
- Potato/corn/other chips 3.8%
- Burgers 2.9%
- Crackers 2.8%
- Pretzels 2.3%
- Ready-to-eat cereals 2.4%
- Pancakes, waffles, French toast 2.2%
- All other food categories 9.5%
Figure 2.20. **USUAL FIBER INTAKE, IN GRAMS, IN COMPARISON TO ADEQUATE INTAKE LEVELS BY AGE/SEX GROUP.**

**Children**

[A chart showing fiber intake comparison for children by age/sex group.]

**Adequate intake level by age/sex group**

*Source: 2010 US Dietary Guidelines Report*
Figure 2.20 USUAL FIBER INTAKE, IN GRAMS, IN COMPARISON TO ADEQUATE INTAKE LEVELS BY AGE/SEX GROUP.

Chapter 3
Foods and Food Components to Reduce

Alcohol

- If alcohol is consumed, consume in moderation
  - For men, up to 2 drinks per day
  - For women, up to 1 drink per day
- Specific guidance for breast-feeding women new
- Circumstances in which people should not drink alcohol listed
Chapter 4
Foods and Nutrients to Increase

A wide variety of nutritious foods are available in the United States. However, many Americans do not eat the array of foods that will provide all needed nutrients while staying within calorie needs. In the United States, intakes of vegetables, fruits, whole grains, milk and milk products[^1] and oils are lower than recommended. As a result, dietary intakes of several nutrients—potassium, dietary fiber, calcium, and vitamin D—are low enough to be of public health concern for both adults and children. Several other nutrients also are of concern for specific population groups, such as folic acid for women who are capable of becoming pregnant.

This chapter describes food choices that should be emphasized to help Americans close nutrient gaps and move toward healthful eating patterns.

Recommendations are based on evidence that consuming these foods within the context of an overall healthy eating pattern is associated with a health benefit or meeting nutrient needs. Guidance on food choices for a healthy eating pattern generally groups foods based on commonalities in nutrients provided and how the foods are viewed and used by consumers. The following recommendations provide advice about making choices from all food groups while balancing calorie needs.

[^1]: Milk and milk products also can be referred to as dairy products.
Chapter 4
Foods and Nutrients to Increase

• While staying within calorie needs, increase intake of
  – Vegetables
  – Fruits
  – Whole grains
  – Milk
  – Seafood, in place of some meat/poultry new
  – Oils
• Nutrients of public health concern
  – Potassium
  – Fiber
  – Calcium
  – Vitamin D
Whole Grain Guidance

FIGURE 4-1. Three Ways to Make at Least Half of Total Grains Whole Grains

1. 3 ounces of 100% whole grains and 3 ounces of refined-grain products
   - 100% 100% 100% 0% 0% 0%

2. 2 ounces of 100% whole grains, 2 ounces of partly whole-grain products, and 2 ounces of refined-grain products
   - 100% 100% ≥51% ≥51% 0% 0%

3. 6 ounces of partly whole-grain products
   - ≥51% ≥51% ≥51% ≥51% ≥51% ≥51%
Chapter 4
Foods and Nutrients to Increase

Key Recommendations

Individuals should meet the following recommendations as part of a healthy eating pattern and while staying within their calorie needs.

Increase vegetable and fruit intake.

Eat a variety of vegetables, especially dark-green and red and orange vegetables and beans and peas.

Consume at least half of all grains as whole grains. Increase whole-grain intake by replacing refined grains with whole grains.

Increase intake of fat-free or low-fat milk and milk products, such as milk, yogurt, cheese, or fortified soy beverages.\(^5\)

Choose a variety of protein foods, which include seafood, lean meat and poultry, eggs, beans and peas, soy products, and unsalted nuts and seeds.

Increase the amount and variety of seafood consumed by choosing seafood in place of some meat and poultry.

Replace protein foods that are higher in solid fats with choices that are lower in solid fats and calories and/or are sources of oils.

Use oils to replace solid fats where possible.

Choose foods that provide more potassium, dietary fiber, calcium, and vitamin D, which are nutrients of concern in American diets. These foods include vegetables, fruits, whole grains, and milk and milk products.
Chapter 4
Foods and Nutrients to Increase

Recommendations for Specific Population Groups

Women capable of becoming pregnant\

Choose foods that supply heme iron, which is more readily absorbed by the body, additional iron sources, and enhancers of iron absorption such as vitamin C-rich foods.

Consume 400 micrograms (mcg) per day of synthetic folic acid (from fortified foods and/or supplements) in addition to food forms of folate from a varied diet.\

Women who are pregnant or breastfeeding\

Consume 8 to 12 ounces of seafood per week from a variety of seafood types.

Due to their methyl mercury content, limit white (albacore) tuna to 6 ounces per week and do not eat the following four types of fish: tilapia, shark, swordfish, and king mackerel.

If pregnant, take an iron supplement as recommended by an obstetrician or other health care provider.

Individuals ages 50 years and older

Consume foods fortified with vitamin B\textsubscript{12}, such as fortified cereals, or dietary supplements.
Chapter 5 *new*
Building Healthy Eating Patterns

- Research on overall eating patterns
  - Considerable evidence for health outcomes from DASH and traditional Mediterranean eating patterns
  - Some evidence for vegetarian
- Common elements of healthy eating patterns identified
- To promote health, follow USDA Food Patterns or DASH Eating Plan
  - Similar to each other and to the healthful eating patterns identified in the research
- Follow food safety recommendations
Comparison of Consumption to Recommendations

**FIGURE 5-1. How Do Typical American Diets Compare to Recommended Intake Levels or Limits?**

**Usual intake as a percent of goal or limit**

**Eat more of these:**
- Whole grains: 15%
- Vegetables: 42%
- Fruits: 52%
- Dairy: 44%
- Seafood: 61%
- Oils: 40%
- Fiber: 56%
- Potassium: 56%
- Vitamin D: 28%
- Calcium: 75%

**Limit**
- Calories from SoFAS*: 280%
- Refined grains: 200%
- Sodium: 149%
- Saturated fat: 110%

**Goal**
USDA Food Patterns
Changes for 2010 Dietary Guidelines

- Vegetarian adaptations
  - Lacto-ovo and vegan

- Two food groups renamed
  - “Meat & Beans” became “Protein Foods”
  - “Milk” became “Dairy Products”
    - Fortified soy milk included

- Milk for 4- to 8-year-olds increased by ½ cup per day

- At least 8 oz per week of seafood for adults
  - 3 to 6 oz for children

- Vegetable subgroups
  - Amounts revised
  - “Orange” revised to “Red and Orange”
Chapter 6 new
Helping Americans Make Healthy Choices

- Current food and physical activity environment is influential—for better and for worse
- All elements of society, have a role
  - Individuals and families
  - Communities
  - Business and industry
  - All levels of government
- Work together to improve the Nation’s nutrition and physical activity
Choose MyPlate “Menu”

Foods to increase:

1) Make half your plate fruits and vegetables

1) Make at least half your grains whole grains

2) Switch to fat-free or low-fat (1%) milk
Status of Cardiovascular Health in US Adults
Prevalence Estimates From the National Health and Nutrition Examination Surveys (NHANES) 2003–2008

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Background—The American Heart Association’s 2020 Strategic Impact Goals define a new concept, cardiovascular (CV) health; however, current prevalence estimates of the status of CV health in US adults according to age, sex, and race/ethnicity have not been published.

Methods and Results—We included 14 515 adults (≥20 years of age) from the 2003 to 2008 National Health and Nutrition Examination Surveys. Participants were stratified by young (20–39 years), middle (40–64 years), and older (≥65 years) ages. CV health behaviors (diet, physical activity, body mass index, smoking) and CV health factors (blood pressure, total cholesterol, fasting blood glucose, smoking) were defined as poor, intermediate, or ideal. Fewer than 1% of adults exhibited ideal CV health for all 7 metrics. For CV health behaviors, nonsmoking was most prevalent (range, 60.2%–90.4%), whereas ideal Healthy Diet Score was least prevalent (range, 0.2%–2.6%) across groups. Prevalences of ideal body mass index (range, 36.5%–45.3%) and ideal physical activity levels (range, 50.2%–58.8%) were higher in young adults compared with middle or older ages. Ideal total cholesterol (range, 23.7%–36.2%), blood pressure (range, 11.9%–16.3%), and fasting blood glucose (range, 31.2%–42.9%) were lower in older adults compared with young and middle-aged adults. Prevalence of poor CV health factors was lowest in young age but higher at middle and older ages. Prevalence estimates by age and sex were consistent across race/ethnic groups.

Conclusions—These prevalence estimates of CV health represent a starting point from which effectiveness of efforts to promote CV health and prevent CV disease can be monitored and compared in US adult populations. (Circulation. 2012; 125:45-56.)
Figure 1. Number of ideal cardiovascular health components in US adults ≥20 years by age and sex group (A and B); National Health Examination surveys 2003-2008.
Trends in Cardiovascular Health Metrics and Associations With All-Cause and CVD Mortality Among US Adults

Quanhe Yang, PhD
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W. Dana Flanders, MD, ScD
Yuling Hong, MD, PhD
Zefeng Zhang, MD, PhD
Fleetwood Loustalot, FNP, PhD
Cathleen Gillespie, MS
Robert Merritt, BA, MA
Frank B. Hu, MD, PhD

Context Recent recommendations from the American Heart Association aim to improve cardiovascular health by encouraging the general population to meet 7 cardiovascular health metrics: not smoking; being physically active; having normal blood pressure, blood glucose and total cholesterol levels; and weight; and eating a healthy diet.

Objective To examine time trends in cardiovascular health metrics and to estimate joint associations and population-attributable fractions of these metrics in relation to all-cause and cardiovascular disease (CVD) mortality risk.


Main Outcome Measures All-cause, CVD, and Ischemic heart disease (IHD) mortality.

Results Few participants met all 7 cardiovascular health metrics (2.0% [95% CI, 1.5%-2.6%] in 1988-1994, 1.2% [95% CI, 0.8%-1.9%] in 2005-2010). Among NHANES III participants, 2673 all-cause, 1085 CVD, and 576 IHD deaths occurred (median follow-up, 14.5 years). Among participants who met 1 or fewer cardiovascular health metrics, age- and sex-standardized absolute risks were 14.8 (95% CI, 13.2-16.5) deaths per 1000 person-years for all-cause mortality, 6.5 (95% CI, 5.5-7.6) for CVD mortality, and 3.7 (95% CI, 2.8-4.5) for IHD mortality. Among those who met 6 or more metrics, corresponding risks were 5.4 (95% CI, 3.6-7.3) for all-cause mortality, 1.5 (95% CI, 0.5-2.5) for CVD mortality, and 1.1 (95% CI, 0.7-2.0) for IHD mortality. Adjusted hazard ratios were 0.49 (95% CI, 0.33-0.74) for all-cause mortality, 0.24 (95% CI, 0.13-0.47) for CVD mortality, and 0.30 (95% CI, 0.13-0.68) for IHD mortality, comparing participants who met 6 or more vs 1 or fewer cardiovascular health metrics. Adjusted population-attributable fractions were 59% (95% CI, 33%-76%) for all-cause mortality, 64% (95% CI, 28%-84%) for CVD mortality, and 63% (95% CI, 5%-89%) for IHD mortality.

Conclusion Meeting a greater number of cardiovascular health metrics was associated with a lower risk of total and CVD mortality, but the prevalence of meeting all 7 cardiovascular health metrics was low in the study population.


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See related article.
Error bars indicate 95% CIs. Y-axis segments shown in blue indicate range from 0 to 8. CVD indicates cardiovascular disease; IHD, ischemic heart disease; NHANES, National Health and Nutrition Examination Survey.
NHLBI Integrated Pediatric Cardiovascular Risk Reduction Guidelines

Nutrition
NHLBI Pediatric Nutrition and Diet Guidelines

• Build upon the 2010 Dietary Guidelines Advisory Committee (DGAC) report
• Add evidence specifying diet changes to reduce CV risk in children
• Special focus on fatty acids and energy density as major contributors to hypercholesterolemia and obesity
Pediatric Risk Reduction Starts at Birth

The Expert Panel concluded...

There is strong, consistent evidence, in accordance with the Surgeon General, WHO, AAP, and the AAFP that:

- Exclusive breastfeeding is recommended for the first 6 months
- Continued breastfeeding is recommended to at least 12 months
- Bottle feeding human milk is 2nd best choice; formula is 3rd best choice
Evidence of Long Term Benefits

• Long term studies report breastfed children have sustained CV health benefits (lower cholesterol, BMI, T2D, cIMT) (Grade B)
• Nutrition counseling from birth on assists in adoption/maintenance of healthy diet (Grade A)
• With guidance, normal and hypercholesterolemic children can safely reduce total fat (< 30% kcal), saturated fat (7-10% kcal) and dietary cholesterol (<300mg/d) (Grade A)
**Evidence-Based Recommendations for Diet and Nutrition: Cardiovascular Health Integrated Lifestyle Diet (CHILD 1)**

<table>
<thead>
<tr>
<th>Age</th>
<th>Recommendation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth – 6 months</td>
<td>Infants should be exclusively breastfed (no supplemental formula or other foods) until age 6 months*</td>
<td>B</td>
</tr>
<tr>
<td>6 months – 12 months</td>
<td>Continue breastfeeding** until at least age 12 months while gradually adding solids; transition to iron-fortified formula until 12 months if reducing breastfeeding.</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Fat intake in infants &lt;12 months should not be restricted without medical indication.</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Limit other drinks to 100% fruit juice ≤ 4oz/day; No sweetened beverages; encourage water.</td>
<td></td>
</tr>
</tbody>
</table>

*Infants who cannot be breastfed should be fed expressed milk. Infants for whom expressed milk is not available should be fed iron-fortified infant formula.

**Recommended first step diet, etc.
## Evidence-Based Recommendations for Diet and Nutrition: Cardiovascular Health Integrated Lifestyle Diet (CHILD 1) continued...

<table>
<thead>
<tr>
<th>Age</th>
<th>Recommendation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 – 24 months</td>
<td>Transition to reduced-fat (2% to fat free) unflavored cow’s milk</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Limit/avoid sugar-sweetened beverage intake; encourage water.</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Transition to table food with:</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>- Total fat 30% of daily kcal/EER</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>- Saturated fat 8-10% of daily kcal/ EER</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>- Avoid trans fat as much as possible</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>- Monounsaturated &amp; polyunsaturated fat up to 20% of daily kcal/EER</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>- Cholesterol &lt; 300 mg/d</td>
<td>B</td>
</tr>
</tbody>
</table>

**Supportive Actions:**
- Milk fat content to be determined by parents & providers based on growth, appetite, nutrient quality and risk of obesity/CVD.
- 100% fruit juice (from a cup); < 4oz/day
- Limit sodium intake
- Consider DASH-type diet rich in fruits, vegetables, whole grains, low-fat/fat-free milk and milk products; lower in sugar
## Evidence-Based Activity Recommendations for Diet and Nutrition: Cardiovascular Health Integrated Lifestyle Diet (CHILD 1)

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<th>Recommendation</th>
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<tbody>
<tr>
<td>2 – 10 years</td>
<td>Primary beverage: fat-free, unflavored milk</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Limit/avoid sugar-sweetened beverage intake; encourage water.</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Encourage high dietary fiber intake from food.</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Fat content:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Total fat 25-30% of daily kcal/EER</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>- Saturated fat 8-10% of daily kcal/EER</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>- Avoid trans fat as much as possible</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>- Monounsaturated &amp; polyunsaturated fat up to</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>20% of daily kcal/EER</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>- Cholesterol &lt; 300 mg/d</td>
<td>A</td>
</tr>
</tbody>
</table>

**Supportive Actions:**

- Teach portions based on EER.
- Encourage moderately increased energy intake during periods of rapid growth and/or regular moderate-to-vigorous physical activity.
- Encourage dietary fiber from foods: Age plus 5g/d.
- Limit naturally sweetened juice (no added sugar) to 4oz/day.
- Limit sodium intake.
- Support DASH-style eating plan.
### Evidence-Based Recommendations for Diet and Nutrition: Cardiovascular Health Integrated Lifestyle Diet (CHILD 1)

<table>
<thead>
<tr>
<th>Age</th>
<th>Recommendation</th>
<th>Grade</th>
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<tbody>
<tr>
<td>11 - 21 years</td>
<td>Primary beverage: fat-free, unflavored milk</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Limit/avoid sugar-sweetened beverage intake; encourage water.</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Encourage high dietary fiber intake from food.</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Fat content:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Total fat 30% of daily kcal/EER</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>- Saturated fat 8-10% of daily kcal/EER</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>- Avoid trans fat as much as possible</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>- Monounsaturated &amp; polyunsaturated fat up to 20% of daily kcal/EER</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>- Cholesterol &lt; 300 mg/d</td>
<td>A</td>
</tr>
</tbody>
</table>

**Supportive Actions:**

- Teach portions based on EER.
- Encourage moderately increased energy intake during periods of rapid growth and/or regular moderate-to-vigorous physical activity.
- Advocate dietary fiber: Goal of 14 g/1,000 kcal
- Limit naturally sweetened juice (no added sugar) to 4-6oz/day.
- Limit sodium intake.
- Encourage healthy eating habits: Breakfast every day, eating meals as a family, limiting fast food meals.
- Support DASH-style eating plan.
## Estimated Calorie Needs per Day by Age, Gender, and Physical Activity Level

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age (Years)</th>
<th>Sedentary</th>
<th>Moderately Active</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Child</strong></td>
<td>2–3</td>
<td>1,000–1,200</td>
<td>1,000–1,400</td>
<td>1,000–1,400</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>4–8</td>
<td>1,200–1,400</td>
<td>1,400–1,600</td>
<td>1,400–1,800</td>
</tr>
<tr>
<td></td>
<td>9–13</td>
<td>1,400–1,600</td>
<td>1,600–2,000</td>
<td>1,800–2,200</td>
</tr>
<tr>
<td></td>
<td>14–18</td>
<td>1,800</td>
<td>2,000</td>
<td>2,400</td>
</tr>
<tr>
<td></td>
<td>19–30</td>
<td>1,800–2,000</td>
<td>2,000–2,200</td>
<td>2,400</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>4–8</td>
<td>1,200–1,400</td>
<td>1,400–1,600</td>
<td>1,600–2,000</td>
</tr>
<tr>
<td></td>
<td>9–13</td>
<td>1,600–2,000</td>
<td>1,800–2,200</td>
<td>2,000–2,600</td>
</tr>
<tr>
<td></td>
<td>14–18</td>
<td>2,000–2,400</td>
<td>2,400–2,800</td>
<td>2,800–3,200</td>
</tr>
<tr>
<td></td>
<td>19–30</td>
<td>2,400–2,600</td>
<td>2,600–2,800</td>
<td>3,000</td>
</tr>
<tr>
<td>Food Group</td>
<td>1,200 Calories</td>
<td>1,400 Calories</td>
<td>1,600 Calories</td>
<td>1,800 Calories</td>
</tr>
<tr>
<td>------------</td>
<td>----------------</td>
<td>----------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Grains*</td>
<td>4-5</td>
<td>5-6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Vegetables</td>
<td>3-4</td>
<td>3-4</td>
<td>3-4</td>
<td>4-5</td>
</tr>
<tr>
<td>Lean meats, poultry, and fish</td>
<td>Servings/day</td>
<td>Servings/day</td>
<td>Servings/day</td>
<td>Servings/day</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------</td>
<td>--------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>3 or less</td>
<td>3-4 or less</td>
<td>3-4 or less</td>
<td>6 or less</td>
<td>6 or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuts, seeds, and legumes</td>
<td>3 per week</td>
<td>3 per week</td>
<td>3-4 per week</td>
<td>4 per week</td>
</tr>
<tr>
<td>3 or less</td>
<td>3 or less</td>
<td>3 or less</td>
<td>5 or less</td>
<td>5 or less</td>
</tr>
<tr>
<td>Fats and oils‡</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2-3</td>
</tr>
<tr>
<td>Sweets and added sugars</td>
<td>3 per week</td>
<td>3 per week</td>
<td>3 per week</td>
<td>5 or less</td>
</tr>
</tbody>
</table>
AMERICAN HEART ASSOCIATION (AHA) 2020 IMPACT GOAL

“By 2020, to improve the cardiovascular health of all Americans by 20% while reducing deaths from cardiovascular diseases and stroke by 20%.”
American Heart Association
2020 Impact Goal
5 Primary Components of Diet Metric

In the context of a diet that is appropriate in energy balance, pursuing an overall dietary pattern that is consistent with a DASH-type eating plan, including but not limited to:

1. **Fruits and vegetables:** ≥4.5 cups per day
2. **Fish:** ≥2 3.5-oz servings per week (preferably oily fish)
3. **Fiber-rich whole grains (≥1.1 grams fiber per 10 grams carbohydrate):** ≥3 1-oz-equivalent servings per day
4. **Sodium:** <1500 mg per day
5. **Sugar-sweetened beverages:** ≤450 kcal (36 oz) /week
Prevalence for CV Health Factors in US Adults

<table>
<thead>
<tr>
<th>Health Factor</th>
<th>Percentage</th>
<th>Poor</th>
<th>Intermediate</th>
<th>Ideal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Smoking</td>
<td>72.2%</td>
<td>3.2%</td>
<td>24.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>33.2%</td>
<td>32.9%</td>
<td>33.8%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>23.2%</td>
<td>23.2%</td>
<td>31.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Healthy Diet Score</td>
<td>76.8%</td>
<td>76.8%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>46.6%</td>
<td>38.4%</td>
<td>15.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>41.7%</td>
<td>41.2%</td>
<td>17.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fasting Plasma Glucose</td>
<td>61.4%</td>
<td>30.4%</td>
<td>8.2%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Legend:
- Poor
- Intermediate
- Ideal
Table 1. Mean intake of energy and mean contribution (kcal) of various foods among US population, by age, NHANES 2005-2006

<table>
<thead>
<tr>
<th>Rank</th>
<th>Food Group</th>
<th>All Persons</th>
<th>Age 2-18</th>
<th>Age 2-3</th>
<th>Age 4-8</th>
<th>Age 9-13</th>
<th>Age 14-18</th>
<th>Age 19+</th>
<th>Age 19-30</th>
<th>Age 31-50</th>
<th>Age 51-70</th>
<th>Age 71+</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grain-based desserts</td>
<td>138</td>
<td>138</td>
<td>68</td>
<td>136</td>
<td>145</td>
<td>157</td>
<td>138</td>
<td>128</td>
<td>145</td>
<td>134</td>
<td>141</td>
</tr>
<tr>
<td>2</td>
<td>Yeast breads</td>
<td>129</td>
<td>114</td>
<td>65</td>
<td>98</td>
<td>109</td>
<td>151</td>
<td>134</td>
<td>120</td>
<td>128</td>
<td>149</td>
<td>141</td>
</tr>
<tr>
<td>3</td>
<td>Chicken and chicken mixed dishes</td>
<td>121</td>
<td>113</td>
<td>59</td>
<td>92</td>
<td>122</td>
<td>143</td>
<td>123</td>
<td>154</td>
<td>141</td>
<td>97</td>
<td>67</td>
</tr>
<tr>
<td>4</td>
<td>Soda/energy/sports drinks</td>
<td>114</td>
<td>118</td>
<td>23</td>
<td>50</td>
<td>105</td>
<td>226</td>
<td>112</td>
<td>186</td>
<td>121</td>
<td>73</td>
<td>33</td>
</tr>
<tr>
<td>5</td>
<td>Pizza</td>
<td>98</td>
<td>136</td>
<td>47</td>
<td>95</td>
<td>128</td>
<td>213</td>
<td>86</td>
<td>129</td>
<td>108</td>
<td>48</td>
<td>21</td>
</tr>
<tr>
<td>6</td>
<td>Alcoholic beverages</td>
<td>82</td>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>18</td>
<td>-</td>
<td>106</td>
<td>120</td>
<td>135</td>
<td>82</td>
</tr>
<tr>
<td>7</td>
<td>Pasta and pasta dishes</td>
<td>81</td>
<td>91</td>
<td>86</td>
<td>97</td>
<td>101</td>
<td>78</td>
<td>78</td>
<td>92</td>
<td>81</td>
<td>75</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>Mexican mixed dishes</td>
<td>80</td>
<td>63</td>
<td>26</td>
<td>40</td>
<td>76</td>
<td>86</td>
<td>85</td>
<td>146</td>
<td>99</td>
<td>48</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>Beef and beef mixed dishes</td>
<td>64</td>
<td>43</td>
<td>19</td>
<td>23</td>
<td>42</td>
<td>70</td>
<td>71</td>
<td>81</td>
<td>78</td>
<td>58</td>
<td>55</td>
</tr>
<tr>
<td>10</td>
<td>Dairy desserts</td>
<td>62</td>
<td>76</td>
<td>40</td>
<td>93</td>
<td>86</td>
<td>64</td>
<td>58</td>
<td>48</td>
<td>58</td>
<td>59</td>
<td>78</td>
</tr>
<tr>
<td>11</td>
<td>Potato/corn/other chips</td>
<td>56</td>
<td>70</td>
<td>37</td>
<td>60</td>
<td>72</td>
<td>88</td>
<td>51</td>
<td>62</td>
<td>61</td>
<td>41</td>
<td>23</td>
</tr>
<tr>
<td>12</td>
<td>Burgers</td>
<td>53</td>
<td>55</td>
<td>14</td>
<td>27</td>
<td>49</td>
<td>99</td>
<td>53</td>
<td>71</td>
<td>60</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>13</td>
<td>Reduced fat milk</td>
<td>51</td>
<td>86</td>
<td>91</td>
<td>95</td>
<td>92</td>
<td>69</td>
<td>39</td>
<td>43</td>
<td>39</td>
<td>35</td>
<td>48</td>
</tr>
<tr>
<td>14</td>
<td>Regular cheese</td>
<td>49</td>
<td>43</td>
<td>32</td>
<td>31</td>
<td>41</td>
<td>60</td>
<td>51</td>
<td>64</td>
<td>52</td>
<td>45</td>
<td>37</td>
</tr>
<tr>
<td>15</td>
<td>Ready-to-eat cereals</td>
<td>49</td>
<td>65</td>
<td>58</td>
<td>77</td>
<td>60</td>
<td>61</td>
<td>44</td>
<td>50</td>
<td>39</td>
<td>41</td>
<td>57</td>
</tr>
</tbody>
</table>

Future Research

- **Overconsumed: SoFAS**
  Research targeting behaviors to lower intake

- **Underconsumed: Vitamin D, Calcium, Potassium, Fiber**
  Research targeting behaviors and environment needed to support increased intake of these nutrients

- **Other concerns:**
  - Conduct studies on the long-term health impact of folic acid fortification on NTDs, CRC, stroke, cognitive function, and other health outcomes
  - Conduct studies on individual eating behaviors to explore factors that may be associated with nutrient intake (breakfast, snacking, meal frequency)
“Let food be thy medicine and medicine be thy food!”

-Hippocrates