Healthy carbohydrates: Challenges in dietary guidance

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From the Science to Me
There is no perfect diet!

- Humans are omnivores and are adaptable to a wide range of foods
- Humans have survived and prospered on all kinds of diets, mostly reflecting access to food supply
  - Traditional Arctic diet: 80% of kcals from fat
  - Traditional African diet: 80% of kcals from carbohydrate
- Because of concerns with fat and cardiovascular disease, U.S. diet moved from higher fat (42% of kcal in 1972) to lower fat (32% of kcal in 2000) – current movement toward lower carbohydrate
Nutrient Adequacy

- Meet nutrient needs without exceeding calorie needs

- Dietary Reference Intakes (DRIs)
  - Acceptable Macronutrient Distribution Ranges (AMDR)
    - Protein: 10 - 35% of kcal
    - Carbohydrates: 45 - 65% of kcal
    - Fat: 20 - 35% of kcal
  - Recommended Dietary Allowance (RDA)
  - Adequate Intake (AI)
  - Tolerable Upper Level Intake (UL)
Senate Select Committee on Nutrition and Human Needs – Dietary Goals the United States (1977)

• Increase carbohydrates to 55%–60% of energy
• Reduce fat to 30% of energy
• SF, MF, PUFAs – 10%/10%/10%
• Reduce cholesterol to 300 mg/day
• Reduce sugar consumption by 40%
• Reduce salt consumption to 3 g/day – 1200 mg sodium
Dietary Guidelines for Americans 1980 - 2010
Development of Dietary Guidelines Policy

DGAC Charter

DGAC is chartered

DGAC Public Meetings: Review of the Science

Public comments encouraged/collected


DGAC Advisory Report submitted to the Secretaries of USDA & HHS

USDA & HHS write the Policy Document

Dietary Guidelines for Americans, 2010 (TBD)

DG’s implemented through Federal programs

New “Pyramid”

Evidence-based Methodology Used to Review the Science
2010 Dietary Guidelines Advisory Committee (DGAC)
NEL Evidence-Based Systematic Reviews

The NEL website provides a detailed evidence portfolio for each of the 2010 DGAC’s systematic reviews. Each evidence portfolio in the NEL contains the systematic review questions, conclusion statements, evidence summaries, search plan and results, and worksheets for each article included in the review. The 2010 DGAC Report summarizes the systematic review findings and provides interpretations and implications related to all aspects of the Committee’s Dietary Guidelines review process. To navigate the library:

1. Select a topic from the menu on the left to examine the evidence reviewed by the 2010 DGAC.
2. Each topic is divided into subtopics of questions reviewed by the Committee.
3. By clicking on a subtopic you can access:
   - **Systematic review questions** - Questions formulated by the Committee.
   - **Conclusion statements** - Concise statements that answer the questions based on the Committee’s review of the evidence.
   - **Evidence summaries** - Synthesis of the articles included in the NEL evidence-based systematic review, including evidence summary paragraphs for each article considered in the review and a summary overview table.
   - **Search plan and results** - A description of the search parameters and selection criteria used to identify peer-reviewed literature related to the topic of interest. Additionally, the final list of articles included in the review is provided, along with the articles excluded from the review with reasons for exclusion.
   - **Worksheets** - Comprehensive, templated evidence worksheets which summarize key evidence from each study and document the methodological appraisal of the study quality.

Available at: www.NutritionEvidenceLibrary.gov
**NEL Process**

1. **Formulate Systematic Review Questions**
   - Exploratory searches
   - Public comment
   - Dialogue with experts
   - Analytical Framework
   - PICO

2. **Literature Search and Sort**
   - Identify study eligibility criteria
   - Determine search strategy
   - Search for relevant studies
   - List included studies
   - List excluded studies and rationale

3. **Extract Evidence From Studies**
   - Create evidence worksheets

4. **Summarize and Synthesize the Evidence**
   - Assess quality of individual studies
   - Assess applicability
   - Summarize and synthesize evidence

5. **Define Research Recommendations**

6. **Develop and Grade Conclusion Statements**
Hierarchy of Evidence

- RCT
- Double Blinded Intervention study
- Prospective, cohort study
- Clinical trial
- Cross-sectional study
- Case Report
- Expert Opinion

Stronger Evidence

Weaker Evidence
Grade Strength of Evidence

• **Quality**
  – Scientific rigor and validity
  – Consider study design and execution

• **Quantity**
  – Number of studies
  – Number of subjects in studies

• **Consistency of findings across studies**

• **Impact**
  – Importance of studied outcomes
  – Magnitude of effect

• **Generalizability**
Evidence Analysis Methodology

Rigorous
Minimizes bias
Transparent
Accessible to stakeholders and consumers
Defines state of the science
Foundation for updates

Answers precise questions • Illuminates research gaps
Chapter 3
Foods and Food Components to Reduce

Key Recommendations

Reduce daily sodium intake to less than 2,300 milligrams (mg) and further reduce intake to 1,500 mg among persons who are 51 and older and those of any age who are African American or have hypertension, diabetes, or chronic kidney disease. The 1,500 mg recommendation applies to about half of the U.S. population, including children, and the majority of adults.

Consume less than 10 percent of calories from saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids.

Consume less than 300 mg per day of dietary cholesterol.

Keep trans fatty acid consumption as low as possible, especially by limiting foods that contain synthetic sources of trans fats, such as partially hydrogenated oils, and by limiting other solid fats.

Reduce the intake of calories from solid fats and added sugars.

Limit the consumption of foods that contain refined grains, especially refined grain foods that contain solid fats, added sugars, and sodium.

If alcohol is consumed, it should be consumed in moderation—up to one drink per day for women and two drinks per day for men—and only by adults of legal drinking age.
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.  

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.
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% (Goal: 59%)
- Vegetables: 42% (Goal: 52%)
- Fruits: 44% (Goal: 61%)
- Dairy: 40% (Goal: 56%)
- Seafood: 28% (Goal: 75%)
- Oils: 44% (Goal: 61%)
- Fiber: 56% (Goal: 75%)
- Potassium: 56% (Goal: 75%)
- Vitamin D: 28% (Goal: 75%)
- Calcium: 75% (Goal: 75%)

Eat less of these:
- Calories from SoFAS*: 149% (Limit: 200%)
- Refined grains: 110% (Limit: 200%)
- Sodium: 149% (Limit: 200%)
- Saturated fat: 280% (Limit: 300%)

Percent of goal or limit
DGAC 2015

• “Settled science” – may not see much change on nutrient levels

• Movement to whole foods and away from nutrients

• Topics such as sustainability, gluten, vegan diets, and food processing have been discussed and may be included in 2015 DGA
2015 DGAC – Dietary patterns, foods and nutrition, and health outcomes

• The US population should consume dietary patterns that are:
  – Rich in vegetables, fruits, whole grains, fish/seafood, legumes, and nuts
  – Moderate in dairy products (e.g. low and non-fat dairy) and alcohol
  – Lower in red and processed meat
  – Low in sugar-sweetened foods and beverages and refined grains
1943: Basic Seven

Margaret Mead: “People don’t eat nutrition – they eat food”

Basic 7 did not specify the number of servings of each food group needed daily
Food advice: Evolution of USDA’s Food Guidance – Moderation and Variety

- 1950s-1960s
- 1970s
- 1992
- 1940s
- 1916
- 2005

Food for Young Children
MyPlate.gov (6/2/11)
Conclusions

• We have moved from nutrient-based recommendations (fiber) to food recommendations (whole grains)
• Whole grains are recommended because they are linked to less cardiovascular disease in observational studies; in contrast, refined grains are not recommended
• Whole grain consumption is low in all population groups
• Current dietary guidance that promotes whole grains, but not refined grains, present challenges for pasta