Approach and Framework of the DRIs

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DRIs

Dietary Reference Intakes

Food and Nutrition Board

U.S. Nutrient Recommendations
RDA – 1940s

• Concepts
  --Assure adequate nutrition
  --Standards for public health programs

• Science Base
  --Observations of usual food patterns
  --Experimentally determined nutrient requirements
Recommended Dietary Allowances

1941
- Energy
- Protein
- 2 minerals (Ca, Fe)
- 6 vitamins (A, C, D, thiamin, riboflavin, niacin)

1989
- Energy
- Protein
- 7 minerals (Ca, Fe, P, Mg, Zn, I, Se)
- 11 vitamins (A, C, D, thiamin, riboflavin, niacin, E, K, B₆, B₁₂, folate)
- Safe and adequate daily dietary intakes (biotin, pantothenate, Cu, Mn, F, Cr, Mo)

Reasons for New Framework

- Advances in knowledge about:
  - Other food components, e.g., fiber, carotenoids
  - Role of dietary factors in chronic disease prevention
  - Statistical approaches
- Many uses
Applications of RDAs

**USERS:**
- Government
- Industry
- Academia
- Health Services

**USES:**
- Guide for procuring food supplies for groups of healthy persons
- Basis for planning meals for groups
- Reference point for evaluating the dietary intake of population subgroups
- Component of food and nutrition education programs
- Reference point for the nutrition labeling of food and dietary supplements

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Plans Summarized by Food and Nutrition Board in 1994

**How Should the Recommended Dietary Allowances Be Revised?**
National Academy Press, 1994
http://www.nap.edu/catalog/9194.html

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DRI Framework Includes:

- Concept of reduction of risk for chronic diseases
- Review of other food components
- Rationale for functional end points used
- Estimates of upper levels of intake
- Recommendations to meet variety of uses
- Multiple values
Criteria for Establishing RDAs
Scientific Database

- Observed intakes in healthy populations
- Epidemiological observations
- Balance studies
- Depletion/repletion studies
- Animal experiments
- Biochemical measurements

Dietary Reference Intakes

Standing Committee on the Scientific Evaluation of Dietary Reference Intakes

- Ca, Vitamin D, Phosphorus, Mg, P
- Iodine, Cu, B-Vitamins, Choline
- Vitamins C and E, Se, S-carotene and Other Carotenoids
- Vitamins A and K, Ca, Cu, Co, Fe, I, Mn, Mo, Ni, Si, V, Zn
- Energy, CHO, Lipids, Amino Acids, Protein, Fiber, Physical Activity
- Electrolytes, Water

Dietary Reference Intake Reports
Dietary Reference Intakes

- Estimated Average Requirement (EAR)
- Recommended Dietary Allowance (RDA)
- Adequate Intake (AI)
- Tolerable Upper Intake Level (UL)
- Acceptable Macronutrient Distribution Ranges (AMDR)

Acceptable Macronutrient Distribution Ranges (AMDR)

- Range of intakes for an energy source (e.g., fat) associated with reduced risk of chronic disease while providing adequate intakes of essential nutrients
- Expressed as % total energy intake
For example, AMDR for adults

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>AMDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat</td>
<td>20% – 35%</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>45% – 65%</td>
</tr>
<tr>
<td>Protein</td>
<td>10% – 35%</td>
</tr>
</tbody>
</table>

Chronic Disease Endpoints

- Of 35 nutrients with EAR or AI, fluoride, potassium, and total fiber clearly had chronic disease end points
- So did UL for sodium/chloride
- The AMDR’s were also oriented toward chronic disease endpoints

Broad Support

- U.S. Department of Health and Human Services*
- U.S. Department of Agriculture*
- U.S. Department of Defense (Army)*
- Health Canada
- Dietary Reference Intakes Private Foundation Fund (including Dannon Institute and International Life Sciences Institute, North America)
- DRI Corporate Donors’ Fund (1999)

*Coordinated by Federal DRI Steering Committee
Single Volume Summary

- Single volume of 1997-2004
- French and English versions
- Format based on input from intended audience: dietitians, nutritionists, other health professionals
- Supported by Health Canada

Thank you

www.iom.edu/fnb
www.nap.edu

Slides not used