Added sugars recommendations: From the DRIs to the current US Dietary Guidelines

Joanne R. Lupton, PhD
Texas A&M University

American Heart Association
Added Sugars Conference
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Disclosures

- Past President, ASN
- Board of Trustees, ILSI NA
- Member, Mars Scientific Advisory Committee
- Member Keystone Food and Nutrition Roundtable
- Scientific Advisor to ASN on Smart Choices Program (Formerly “Keystone”)
- National Advisory Panels: 2005 Dietary Guidelines; DRI Panel for Macronutrients; DRI Panel for Definition of Dietary Fiber
- Funding primarily from NIH/NCI; NASA; and NSBRI
Focus of the talk

► The issue with “added sugars”
► Recommendation of the DRI Macronutrient Panel
  ▪ Based on micronutrient dilution
► Recommendation of the 2005 DGA Committee
  ▪ Based on “added sugar” as discretionary calories
Focus of the talk

- The issue with “added sugars”
- Recommendation of the DRI Macronutrient Panel
  - Based on micronutrient dilution
- Recommendation of the 2005 DGA Committee
  - Based on “added sugar” as discretionary calories
The issue with added sugars

- Increased energy intake
- Decreased micronutrient intake
Focus of the talk

► The issue with “added sugars”
► Recommendation of the DRI Macronutrient Panel
  ▪ Based on micronutrient dilution
► Recommendation of the 2005 DGA Committee
  ▪ Based on “added sugar” as discretionary calories
Sugar Intake and BMI (DRI Report)
Table 6-11

<table>
<thead>
<tr>
<th>Reference</th>
<th>Study Design</th>
<th>Sugar Intake (% of energy)</th>
<th>BMI (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dunnigan et al, 1970</td>
<td>9 men and women 4-wk crossover</td>
<td>31% sucrose Sucrose-free</td>
<td>62.4 63.8</td>
</tr>
<tr>
<td>Fehily et al., 1984</td>
<td>493 men, 45-59 y 7-d diet record</td>
<td>Significant negative association between sucrose intake and BMI</td>
<td></td>
</tr>
<tr>
<td>Dreon et al., 1988</td>
<td>155 obese men, 30-59 y, 7-d diet record</td>
<td>Significant negative association between sucrose intake and BMI</td>
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</tr>
<tr>
<td>Miller et al., 1990</td>
<td>107 men 100 women 18-72 y 24-h recall</td>
<td>Significant negative association between sugar intake and % body fat for women; no association for men</td>
<td></td>
</tr>
<tr>
<td>Gibson, 1993</td>
<td>2,705 boys and girls Dept of Health UK</td>
<td>Boys 10-11y &lt;20.7 &lt;25.2</td>
<td>18.6 a 17.5 b</td>
</tr>
<tr>
<td>Bolton-Smith and Woodward, 1994</td>
<td>11,626 men and women 25-64 y Scottish Heart Health</td>
<td>Significant negative association between sugar intake and BMI</td>
<td></td>
</tr>
<tr>
<td>Gibson, 1996</td>
<td>1,087 men, 1,110 women 16-64 y, UK</td>
<td>Weak negative association between sugar intake and BMI</td>
<td></td>
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</tbody>
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# Added sugar intake and BMI (Macronutrient DRI Report Table 6-11 Cont.)

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<th>Sugar Intake (% of energy)</th>
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<tr>
<td>Lewis et al., 1992</td>
<td>National Food Consumption Survey (1977-1978)</td>
<td>High consumers of added sugars tended to weigh less than moderate consumers</td>
<td></td>
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<td>Bolton-Smith and Woodward, 1994</td>
<td>11,626 men and women 25-64 y Scottish Heart Health and MONICA studies</td>
<td>Significant negative association between added sugar intake and BMI</td>
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<td>Gibson, 1996</td>
<td>1,087 men, 1,110 women 16-64 y, Dietary and Nutritional Survey of British Adults</td>
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<tr>
<td>Ludwig et al., 2001</td>
<td>Planet Health intervention and evaluation project</td>
<td>For each additional serving of sugar-sweetened drink consumed, BMI and frequency of obesity increased; baseline consumption of sugar-sweetened drinks was independently associated with change in BMI</td>
<td></td>
</tr>
</tbody>
</table>
Decreasing micronutrient intake

Most added sugars are in energy-dense, nutrient-poor foods, whereas naturally occurring sugars are primarily found in fruits, milk, and dairy products that also contain essential micronutrients.
Added sugar intake effect on micronutrient intake

► Bowman (1999)
   - Used data from Continuing Survey of Food Intakes of Individuals (CSFII, 1994-1996) to assess the relationship between added sugars and intakes of essential nutrients.

► Sample
   - N = 14,704 was divided into three groups based on % energy consumed from added sugars
     - < 10% of total energy (n=5,058)
     - 10 – 18% of energy (n=4,488)
     - > 18% of energy (n=5,158)

► Results
   - Group 3 (> 18% of energy with a mean of 26.7% energy from added sugars) had the lowest absolute mean intakes of all the micronutrients.
   - Especially
     - Vitamins: A, C, B12, folate,
     - Minerals: Calcium, Phosphorus, magnesium and iron
Based on the review of added sugars intake and micronutrient dilution

▶ The DRI Macronutrient Committee
  ▪ Modeled every 5\textsuperscript{th} percentile of added sugars intake against micronutrient intake
  ▶ Using data from the third National NHANES Survey
  ▶ Not all micronutrients were evaluated including fiber
Calcium intake in children 4-8 Y as a function of added sugar intake

Frary et al. Journal of Adolescent Health 34:56-63, 2004
Recommendation on “added sugar” consumption from the DRI Macronutrient report

- The recommendation for “Added sugars” is that they not be more than 25% of total Kcals
- Based on added sugar intake data combined with nutrient intake data
Focus of the talk

- The issue with “added sugars”
- Recommendation of the DRI Macronutrient Panel
  - Based on micronutrient dilution
- Recommendation of the 2005 DGA Committee
  - Based on “added sugar” as discretionary calories
An increasing number of longitudinal studies do show an increase in weight gain with added sugars from certain sources:

- Berkey et al. *Obesity Research*, 2004
- Phillips et al. *Obesity Research*, 2004
The concept of discretionary calories

- Determine daily energy requirements
- Subtract calories required to meet nutrient requirements from food
- What is “left over” are discretionary calories

Mypyramid.gov
Using the USDA food guidance system

► The form of the food that is used to set the recommended amount of food from each food group is the food item that is lowest in fat, added sugars and sodium.

► For example, all “dairy” is represented by non fat milk, all “meat” is represented by the lowest fat version.
How many discretionary calories do we really have

- 2/3 of adults have no discretionary calories since they are overweight or obese
- Most others are not meeting their nutrient requirements through their diet
We do not always make the best food choices to obtain our nutrients

- Our greatest source of fiber from vegetables is…
- Our greatest source of fiber from grains is…
Dietary Guidelines
Statement on “Added Sugars”

…A reduced intake of added sugars (especially sugar-sweetened beverages) can lower calorie intake, and may be helpful in achieving recommended intakes of nutrients and in weight control.
Summary

- The primary issue with excessive calories from added sugars is:
  - Nutrient dilution
  - Excess calories

- The recommendation from the DRI Macronutrient Report:
  - No more than 25% of calories from added sugars

- The recommendation from the 2005 Dietary Guidelines:
  - Added sugars are discretionary calories and should be limited
Members of the Macronutrient DRI Panel

- Joanne R. Lupton, Chair, Texas A&M
- George A. Brooks, UC Berkeley
- Nancy F. Butte, Children’s Nutrition Research Center
- Benjamin Caballero, Johns Hopkins
- Jean Pierre Flatt, U Mass
- Susan K. Fried, U Maryland
- Peter J. Garlick, SUNY Stony Brook
- Scott M. Grundy, U Texas Southwestern Medical Center
- Sheila M. Innis, U British Columbia
- David J.A. Jenkins, U Toronto
- Rachel K. Johnson, U Vermont
- Ronald M. Krauss, UC Berkeley
- Penny Kris-Etherton, Penn State
- Alice H. Lichtenstein, Tufts
- Frank Q. Nuttall, U Minnesota
- Paul. B. Pencharz, U Toronto
- F. Xavier Pi-Sunyer, Columbia Univ.
- William M. Rand, Tufts
- Peter J. Reeds, U Illinois
- Eric B. Rimm, Harvard
- Susan B. Roberts, Tufts
Members of the 2005 Dietary Guidelines Advisory Committee

- Janet C. King, PhD, RD, Chair
  Children's Hospital Oakland, CA
- Lawrence J. Appel, MD, MPH
  Johns Hopkins
- Benjamin Caballero, MD, PhD
  Johns Hopkins
- F. Xavier Pi-Sunyer, MD, MPH
  Columbia Univ.
- Yvonne L. Bronner, ScD, RD, LD
  Morgan State Univ.
- Carlos A. Camargo, MD, Dr. PH
  Harvard
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  UCLA
- Joanne R. Lupton, PhD
  Texas A&M Univ
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  Univ South Carolina
- Connie M. Weaver, PhD
  Purdue Univ.
- Penny M. Kris-Etherton, PhD, RD
  Penn State
- Theresa A Nicklas, Dr PH, MPH, LN
  Baylor College of Medicine
- Scientific Writer/Editor
  Carol Suitor, Sc.D.