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Background

• Naturally occurring iodine
• Iodine fortified salt
• Increasing usage of processed foods and concerns on reducing sodium consumption
• Nutrient inadequacy in pregnant women
• Nutrient in excess for children
Food and Drug Administration

• Mission
  – The 1990 Nutrition Labeling and Education Act (NLEA)
  – A food is considered to be misbranded unless its label or labeling bears nutrition labeling
  – Certain nutrients and food components are to be included in nutrition labeling to assist consumers in maintaining healthy dietary practice

Objectives

• To estimate the prevalence of iodine inadequacy based on usual iodine intake distributions from food and from total (food plus dietary supplements) for 13 age-gender groups in the U.S. population aged 4 years and older and for pregnant women.
• To identify the main food sources of iodine.
Total Diet Study
4 Regional Market Baskets/year
In Each Market Basket:

Food 1 → Table-ready → Food 1 Composite → Analysis → Food 1 Nutrient Values

Food 2 → Table-ready → Food 2 Composite → Analysis → Food 2 Nutrient Values

Total ~ 280 foods

Dietary Intake Data

- Dietary Intake Data
  - What We Eat in America, National Health and Nutrition Examination Surveys (WWEIA, NHANES)
  - Stratified, multi-stage, probability sampling
    - Reliable day 1 and day 2
Subjects & Data Analysis

• **Subjects:**
  – Age 4 years and older (n=23,165)
  – 13 age-gender groups
    • M+F: 4-8
    • M/F: 9-13, 14-18, 19-30, 31-50, 51-70, 71+
  – Pregnant women (n=679)

• **Analytical method:**
  – Usual intake distributions
    • Food
    • Total (food + daily dietary supplement)
  – National Cancer Institute
  – Prevalence of nutrient inadequacy
    • Weighted Estimated Average Requirement (weighted EAR)
    • Estimated Average Requirement (EAR)

Iodine Food Sources

<table>
<thead>
<tr>
<th>Main food groups</th>
<th>Sub-food groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk and Cheese</td>
<td>Milk, Cream, Milk Desserts, Cheeses</td>
</tr>
<tr>
<td>Meat/poultry/ fish, non-meat</td>
<td>Beef, Pork, Lamb, Poultry, Organs, Fish/Shellfish, Non-Meat</td>
</tr>
<tr>
<td>Eggs</td>
<td></td>
</tr>
<tr>
<td>Legumes</td>
<td></td>
</tr>
<tr>
<td>Nuts and Seeds, nut butters</td>
<td>Nuts/Nut butters, Seeds</td>
</tr>
<tr>
<td>Grain and grain mixtures</td>
<td>Yeast Breads, Quick Breads, Cakes, Crackers, Pancakes, Pastas, Cereals, Mixtures/Frozen Meals/Soups</td>
</tr>
<tr>
<td>Fruits</td>
<td>Citrus, Other, Fruit Juices</td>
</tr>
<tr>
<td>Vegetables</td>
<td>Potatoes, Dark-Green, Deep-Yellow, Tomatoes, Others</td>
</tr>
<tr>
<td>Fats and oils</td>
<td>Fats, Oils, Salad Dressing</td>
</tr>
<tr>
<td>Sugars and sweets</td>
<td></td>
</tr>
<tr>
<td>Beverages</td>
<td>Water, Carbonated, Fruit Drinks, Alcoholic</td>
</tr>
</tbody>
</table>
**Results**

Mean Iodine Intake from Food by Age-Gender Groups
WWEIA-NHANES 2003-2008, Day 1

Mean Iodine Intake from Food and Dietary Supplement by Age-Gender Groups
WWEIA-NHANES 2003-2008, Day 1
Iodine Usual Intake Distributions from Food plus Dietary Supplement by Age Groups

Iodine Usual Intake Distributions Pregnant Women
## Food Sources of Iodine

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Percent Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk and Cheese</td>
<td>46.3</td>
</tr>
<tr>
<td>Meat, Poultry and Fish/Shellfish</td>
<td>11.1</td>
</tr>
<tr>
<td>Eggs</td>
<td>5.3</td>
</tr>
<tr>
<td>Legumes</td>
<td>0.4</td>
</tr>
<tr>
<td>Nuts and Seeds, Nut butters</td>
<td>0.1</td>
</tr>
<tr>
<td>Grains and Grain Mixtures</td>
<td>27.6</td>
</tr>
<tr>
<td>Fruits</td>
<td>1.6</td>
</tr>
<tr>
<td>Vegetables</td>
<td>4.1</td>
</tr>
<tr>
<td>Fats and Oils</td>
<td>0.3</td>
</tr>
<tr>
<td>Sugars and Sweets</td>
<td>1.4</td>
</tr>
<tr>
<td>Beverages</td>
<td>1.8</td>
</tr>
</tbody>
</table>

## Summary

- The mean daily intakes of iodine from food for the 13 age-gender groups ranged from 214 to 349 mcg with the highest found among males, ages 14-18 years.
- The mean intake of iodine from food by pregnant women was 312 mcg.
- The prevalence of inadequate iodine intake from food was 2.3% and 8.5% among the U.S. population, aged 4 years and older and pregnant women, respectively.
Summary (cont.)

• The prevalence of iodine inadequacy did not change much when dietary supplements were included.

• Milk and cheese products, bread, meat/poultry/fish, and eggs were the top food sources for both aged 4 years and older and pregnant women.

• Milk and milk drinks providing about 36% of total iodine from food.

Conclusions

• There is a low prevalence of iodine inadequacy for the U.S. population, including pregnant women.

• Efforts in monitoring intake and strengthening food composition data are warranted.