Nutrition for Your Health
Chemistry and Society Forum

Susan Nitzke, PhD, RD
Professor Emerita
UW-Madison
Points of Emphasis

• Nutrition issues are at the crossroads of chemistry and society
• Obesity is an overarching concern
• Sodium illustrates many key chemistry <-> society principles
• Other nutrients of concern:
  – Saturated fat
  – vitamin A, vitamin D, vitamin E, vitamin C, folate, calcium, magnesium, fiber, and potassium – plus iron for women
Says Who?

- U.S. Centers for Disease Control and Prevention (CDC)
- USDA’s MyPlate
- Michael Pollan on advocating for change
Obesity Facts

- Obesity raises risk of heart disease, stroke, type 2 diabetes and certain types of cancer.
- In 2008, U.S. medical costs associated with obesity were $147 billion
- Medical costs for obese people were $1,429 higher than for those of normal/healthy weight.
Obesity affects some groups more than others

• Non-Hispanic blacks have the highest age-adjusted rates of obesity (49.5%) compared with Mexican Americans (40.4%), all Hispanics (39.1%) and non-Hispanic whites (34.3%)

BMI is used to measure overweight and obesity

• Weight (lb) / [height (in)]^2 \times 703

• Example: \[150 \div (65)^2 \times 703 = 24.96\]

• For adults, <18.5 is underweight, 18.5 – 24.9 is healthy/normal weight, 25 - 29.9 is overweight, and >30 is obese
Obesity causes/contributes to health problems

- All-causes of death
- High blood pressure
- High LDL cholesterol, low HDL cholesterol, or high triglycerides
- Type 2 diabetes
- Coronary heart disease
- Stroke

- Gallbladder disease
- Sleep apnea and breathing problems
- Chronic inflammation and oxidative stress
- Some cancers (endometrial, breast, colon, kidney, gallbladder, and liver)
Prevalence of Self-Reported Obesity Among U.S. Adults 2013

*Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.

- 15%–<20%
- 20%–<25%
- 25%–<30%
- 30%–<35%
- ≥35%
Overwt. & Obesity over Time

**BMI = 25 to <30  **BMI = 30 to <40  **BMI = 40 and over
Overwt. & Obesity in Children

Boys

Girls

*BMI = 25 to <30  **BMI = 30 to <40  ***BMI = 40 and over
Nutrition is a personal and societal concern for Americans of every shape and size
Put on your thinking cap (no peeking)

• Which nutrients would you say we need more of in American dietary patterns?
• What are overconsumed nutrients?
Shortfall Nutrients

- vitamin A,
- vitamin D*
- vitamin E
- vitamin C
- folate

*Nutrients of public health concern

- calcium*
- magnesium
- fiber*
- potassium*
- iron* for adolescent & premenopausal females
Overconsumed Nutrients

- Sodium
- Saturated fat
- Added sugars

Goals for the general population:
- less than 2,300 mg dietary sodium per day
- less than 10 percent of total calories from saturated fat per day
- a maximum of 10 percent of total calories from added sugars per day
DGAC’s Recommended Dietary Pattern

Higher in:
• vegetables
• fruits
• whole grains
• low- or non-fat dairy
• seafood
• legumes (beans)
• nuts

Lower in:
• red meats and processed meats
• sugar-sweetened foods and drinks
• refined grains.

Moderate in alcohol (adults)
Sodium Chloride = NaCl = Salt

- Both terms may be seen on labels.
- 90% of the sodium we consume is in the form of salt which is 40% sodium.
- High sodium intake raises blood pressure, a major cause of heart disease and stroke.
- Average daily sodium intake is >3,400 milligrams (mg) in the U.S., compared to goal of <2,300 mg (about a tsp.)
Sodium Density by Source

- **Store**
- **Restaurant**
- **Quick serve restaurant**
- **School/day care**

**HEI Limit**

<table>
<thead>
<tr>
<th>Year</th>
<th>Store</th>
<th>Restaurant</th>
<th>Quick serve restaurant</th>
<th>School/day care</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003-04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005-06</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007-08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tips for Eating Less Sodium


- Think fresh
- Enjoy home-prepared foods
- Fill up on veggies and fruits
- Choose dairy & protein foods lower in sodium
- Adjust your taste buds

- Skip the salt
- Read the label
- Ask for low sodium foods when eating out
- Pay attention to condiments
- Boost your potassium intake
Tips for Eating Less Sodium


• Think fresh
• Enjoy home-prepared foods
• Fill up on veggies and fruits
• Choose dairy & protein foods lower in sodium
• Adjust your taste buds
• Skip the salt
• Read the label
• Ask for low sodium foods when eating out
• Pay attention to condiments

• Boost your potassium intake
Potassium

• Aim for 4,700 milligrams of potassium from food and beverages each day.
• Potassium helps to counterbalance some of sodium's harmful effects on blood pressure.
• Food Sources
  – leafy greens, such as spinach and collards
  – fruit from vines, such as grapes and blackberries
  – root vegetables, such as carrots and potatoes
  – citrus fruits, such as oranges and grapefruit
Whole Grains

The bar chart illustrates the percentage of males and females meeting whole grain recommendations across different age groups. The recommendations are for consuming at least 3 oz of whole grains daily. The chart shows the percentage of individuals below, at, or above this recommendation.
Refined Grains

Males
1-3 y
4-8 y
9-13 y
14-18 y
19-30 y
31-50 y
51-70 y
71+y

Females
1-3 y
4-8 y
9-13 y
14-18 y
19-30 y
31-50 y
51-70 y
71+y

% below recommendation
% at or above recommendation

Intake below recommendation
Intake meeting recommendation
Intake above recommendation
Whole Grains 2001-04 vs 2007-10
Whence Cometh Thy Grains?

**Whole Grains**
- **Store**
- **Restaurant**

**Refined Grains**
- **Quick serve restaurant**
- **School/day care**

**Ounce equivalents**
- **HEI Standard**
- **HEI Limit**

**Years:**
- 2003-04
- 2005-06
- 2007-08
- 2009-10
Dairy

(3 cups / day in 2000 calorie diet)
Dairy: 2001-04 vs 2007-10

Graph showing the comparison of mean intake of dairy products (in cup equivalents) between males and females in different age groups from 2001-04 and 2007-10.
Added Sugars

(4-6% of calories or 4.5-9.4 tsp)
Forms of Added Sugar

- granulated/white sugar or sucrose
- dextrose or anhydrous dextrose
- brown sugar
- confectioner's powdered sugar
- corn syrup or solids
- fructose
- high-fructose corn syrup (HFCS)

- honey
- invert sugar
- lactose
- malt syrup
- maltose
- maple syrup
- molasses
- nectars (e.g., pear)
- pancake syrup
- raw sugar/cane juice
Sources of Added Sugars

- Snacks and sweets: 31%
- Beverages (not milk or 100% fruit juice): 47%
- Grains: 8%
- Protein foods: 4%
- Mixed dishes: 6%
- Condiments, gravies, spreads, salad dressings: 2%
- Fruits and fruit juice: 1%
- Vegetables: 1%
- Alcoholic beverages: 1%
  - Coffee and tea: 7%
  - Soft drinks: 25%
  - Fruit drinks: 11%
  - Sport and energy drinks: 3%
  - Sugar sweetened beverages: 39%
Sources of Saturated Fats

- Mixed dishes: 35%
- Beverages (not milk or 100% fruit juice): 1%
- Condiments, gravies, spreads, salad dressings: 7%
- Dairy: 13%
- Protein foods: 15%
- Grains: 4%
- Snacks and sweets: 18%

Other categories:
- Pizza: 6%
- Burgers, sandwiches: 19%
- Meat, poultry, seafood dishes: 14%
- Rice, pasta, grain dishes: 5%
- Soups: 1%
Sat. Fat Density by Source

Percent of energy

2003-04  2005-06  2007-08  2009-10

2010 DGA Limit

- Store
- Restaurant
- Quick serve restaurant
- School/day care
Sustainability

• The major findings regarding sustainable diets were that a diet higher in plant-based foods, such as vegetables, fruits, whole grains, legumes, nuts, and seeds, and lower in calories and animal-based foods is more health promoting and is associated with less environmental impact than is the current U.S. diet.
Seafood Issues

• Overfishing in the past decades has raised concern about the ability to produce a safe and affordable supply.
• Concerns have been raised about the safety and nutrient content of farm-raised versus wild-caught seafood
• To supply enough seafood to support meeting dietary recommendations, both farm-raised and wild caught seafood will be needed.
Your To-Do List from DGAC:

- Know and understand how to modify your diet and physical activity.
- Know your current dietary pattern, including your healthy choices that can be maintained as well as areas for potential change.
- Act on this information.
- Seek to make gradual and sustainable changes in your dietary behaviors.
Challenge:
• DGAs and USDA’s MyPlate summarize science-based information on what and how to eat for health.
• You must decide how to put the recommendations into action in a way that fits your personal life situation and values/beliefs.
Questions?