Principles of a Healthy Diet

Principles of a Healthy Diet: How Do We Know What To Eat?

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Acknowledgements

• Katie Ferraro, MPH, RD, CDE
• Beth Gonzales, MSPH, RD

Why Do Care About What We Eat?

<table>
<thead>
<tr>
<th>US Leading Causes of Death, CDC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Heart Disease</td>
<td>32.6%</td>
</tr>
<tr>
<td>2. Cancer</td>
<td>30.9%</td>
</tr>
<tr>
<td>3. Chronic lower respiratory disease</td>
<td>7.8%</td>
</tr>
<tr>
<td>4. Stroke</td>
<td>7.0%</td>
</tr>
<tr>
<td>5. Accidents</td>
<td>6.4%</td>
</tr>
<tr>
<td>6. Alzheimer’s disease</td>
<td>4.3%</td>
</tr>
<tr>
<td>7. Diabetes</td>
<td>3.7%</td>
</tr>
<tr>
<td>8. Influenza and pneumonia</td>
<td>2.9%</td>
</tr>
<tr>
<td>9. Nephritis, nephrotic syndrome &amp; nephrosis</td>
<td>2.7%</td>
</tr>
<tr>
<td>10. Intentional self-harm (suicide)</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

Lifestyle and Disease

• 1/3 of premature deaths in the U.S. are attributable to poor nutrition and physical inactivity.
• 50% of American adults do not get the recommended amount of physical activity.
• Only 10% of Americans eat a healthy diet consistent with federal nutrition recommendations.
  ➢ Too high in saturated and trans fat, salt, and refined sugars.
  ➢ Too low in fruits, vegetables, whole grains, calcium, and fiber.
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Diet & Disease: Nature or Nurture?

Your actual risk of disease results from the interplay between the genes you inherit and the diet and lifestyle choices you make.

The genes you inherit may give you a greater or lesser tendency to develop conditions like obesity, heart disease, high blood pressure, or diabetes.

The nutrients and food components you consume and the amount of exercise you get can increase or decrease your risk of developing nutrition-related diseases.

U.S. Calorie Intake

- Calorie consumption in the U.S. has increased 30% over the past 4 decades.

<table>
<thead>
<tr>
<th>Year</th>
<th>Average calories consumed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>2,057</td>
</tr>
<tr>
<td>2008</td>
<td>2,674</td>
</tr>
</tbody>
</table>

Top calorie sources in U.S.

1. Grain-based desserts
2. Yeast breads
3. Chicken and chicken-mixed dishes
4. Soda, energy drinks, and sports drinks
5. Pizza
6. Alcoholic beverages
7. Pasta and pasta dishes
8. Mexican mixed dishes
9. Beef and beef dishes
10. Dairy desserts

Extra Calories From Eating Away From Home

<table>
<thead>
<tr>
<th></th>
<th>Calories/meal at home</th>
<th>Calories/meal at a restaurant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Weight</td>
<td>550</td>
<td>825</td>
</tr>
<tr>
<td>Overweight/Obese</td>
<td>625</td>
<td>900</td>
</tr>
</tbody>
</table>

Public Health Nutrition, 2013
Principles of a Healthy Diet

Beware of the Calories in Restaurant Foods
Center for Science in the Public Interest, 2012

Macronutrients
- Needed in large amounts in the body
- “Large amounts” = grams, abbreviated g
- Energy yielding & includes:
  - Carbohydrates 4 kcal/gram
  - Proteins 4 kcal/gram
  - Fats 9 kcal/gram
  - Alcohol 7 kcal/gram
- Energy is measured in calories (kilocalories, kcals, Cals)

Counting Calories

How many calories are in one cup of this cottage cheese?

Counting Calories

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Grams</th>
<th>Cal/gram</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat</td>
<td>4 g</td>
<td>9</td>
<td>36 cals</td>
</tr>
<tr>
<td>CHO</td>
<td>8 g</td>
<td>4</td>
<td>32 cals</td>
</tr>
<tr>
<td>Pro</td>
<td>31 g</td>
<td>4</td>
<td>124 cals</td>
</tr>
</tbody>
</table>

Total Calories in 1 serving (1 cup) = 192 cals
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Recommended Intakes for Macronutrients

- Protein: 10% to 35%
- Carbohydrate: 45% to 65%
- Fat: 20% to 35%

Institute of Medicine

Micronutrients

- Needed in smaller amounts in the body
- "Smaller amounts" = Milligrams (mg) or Micrograms (mcg or µg)
- Non-energy yielding & includes:
  - Vitamins
  - Minerals

Nutrients of Public Health Concern

- Potassium
- Dietary Fiber
- Calcium
- Vitamin D

FDA Approved Health Claims

“High Scientific Agreement”

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Association</th>
<th>Nutrient</th>
<th>Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>Osteoporosis</td>
<td>Folate</td>
<td>Neural tube defect</td>
</tr>
<tr>
<td>Sodium</td>
<td>↑ Risk HTN</td>
<td>Sugar alcohols</td>
<td>Tooth decay</td>
</tr>
<tr>
<td>Saturated fat &amp; Cholesterol</td>
<td>↓ CHD risk</td>
<td>Sol fiber: whole grains &amp; psyllium</td>
<td>↓ Heart disease risk</td>
</tr>
<tr>
<td>Dietary fat</td>
<td>↓ Cancer risk</td>
<td>Soy protein</td>
<td>↓ Cancer risk</td>
</tr>
<tr>
<td>Fiber grains, F/V</td>
<td>↓ Cancer risk</td>
<td>Whole grains</td>
<td>↓ Heart disease risk</td>
</tr>
<tr>
<td>Soluble fiber, grains, fruit &amp; veg</td>
<td>↓ CHD risk</td>
<td>Plant sterol &amp; stanol esters</td>
<td>↓ Heart disease risk</td>
</tr>
<tr>
<td>Fruits &amp; vegetables</td>
<td>↓ Cancer risk</td>
<td>Potassium</td>
<td>↓ HTN &amp; stroke risk</td>
</tr>
</tbody>
</table>
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Nutrient Density

- Measure of the nutrients a food provides relative to the energy it provides
- More nutrients & fewer calories → more nutrient dense
- Select foods from each food group without added fats & sugars

![Nutrient Density](image)

Phytochemicals

- Substances found in plant foods
- Not essential nutrients
- May have health-promoting properties
- Examples: carotenoids, flavonoids, phytoestrogens
### Principles of a Healthy Diet

- Wide variety of foods
- High food quality
- Moderation (right quantity)

### Enriched vs. Fortified Foods

**Enrichment:** adding back nutrients lost during processing
- White bread with B vitamins added back

**Fortification:** Adding nutrients not in the food to begin with
- Calcium fortified orange juice
- Iodine fortified salt
- Vitamin D fortified milk

### Functional Foods

- Foods with health promoting or disease-preventing properties that go beyond basic nutritional functions

**Examples:**
- Margarine with plant sterols
- Breakfast cereal with flaxseed,
- Orange juice with calcium

### “Basic Four” Food Groups (1956)
Principles of a Healthy Diet

Food Group Pyramid (1992)

Actual U.S. Intake

MyPlate (2010)

MyPlate
**Dietary Guidelines for Americans 2010**

### Key Recommendations

<table>
<thead>
<tr>
<th>Balancing Calories</th>
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<tr>
<td>Enjoy your food, but eat less</td>
</tr>
<tr>
<td>Avoid oversized portions</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Foods to Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make half your plate fruits and vegetables</td>
</tr>
<tr>
<td>Switch to fat-free or low-fat (1%) milk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Foods to Reduce</th>
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</thead>
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<tr>
<td>Compare sodium in foods like soup, bread, and frozen meals—and choose the foods with lower numbers</td>
</tr>
<tr>
<td>Drink water instead of sugary drinks</td>
</tr>
</tbody>
</table>

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**Dietary Guidelines 2010**

### Addressing Overweight & Obesity:

- Reduce the incidence and prevalence of overweight and obesity of the US population...
- by reducing overall calorie intake and increasing physical activity

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**Dietary Guidelines 2010**

### Regarding Food Patterns

- Shift food intake patterns to a diet that emphasizes vegetables, cooked dry beans and peas, fruits, whole grains, nuts & seeds
- Increase the intake of seafood & fat-free & low-fat milk and milk products
- Consume only moderate amounts of lean meats, poultry & eggs

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**Dietary Guidelines 2010**

### Foods to Reduce

- Significantly reduce intake of foods containing solid fats and added sugars because these dietary components contribute excess calories and few, if any nutrients
- Reduce sodium intake and lower intake of refined grains that are coupled with added sugar, solid fat and sodium
Too Many Refined Grains

- Federal guidelines recommend six 1 ounce servings per day for a 2000 calorie diet, and half should be whole grain.
- The average person eats 8 servings of grains per day, and 7 of the 8 are refined.

What is a serving of grain?

- 1/2 cup cooked rice or other cooked grain
- 1/2 cup cooked pasta
- 1/2 cup cooked hot cereal, such as oatmeal
- 1 six inch tortilla
- 1 slice of bread (1 oz.): ½ bun
- 1 very small (1 oz.) muffin
- ½-1 cup ready-to-eat cereal
(½ cup = ½ a baseball)

Select whole grains

- Look for “whole” in the first ingredient on the label.
- Aim for total carbs/fiber = <10 for bread and <5 for cereals.

Estimating Portion Sizes

Use these “handy” guides for easy measuring:

- Fist (1 cup)
- Palm (3 ounces)
- Thumb (1 ounce)
- Thumb Tip (1 tsp.)
- Handful (1-2 ounces)
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Way Too Much Added Sugar
The average person consumes 30 teaspoons of sugar and sweeteners per day (~15% of calories).

- The AHA recommendations ≤6 teaspoons (24 grams) of added sugar per day for women, and ≤9 (36 grams) for men.
- A 20 oz. soda has twice that.


Added sugar is found in much more than just sodas
- Sugar has many names: cane and beet sugar, high fructose corn syrup, corn syrup, dextrose, honey

Dietary Guidelines 2010
Addressing Sodium:
- 2,300 mg per day for general population
- 1,500 mg for aged 51+, African Americans & hypertension, diabetes & kidney disease

Sodium
But:
- 1/2 of U.S. would qualify for 1,500 mg recommendation
- Average current intake 3,400 mg per day (1.5 teaspoon salt)

Institute of Medicine: May 2013:
- Limit everyone to 2,300 mg per day (1 teaspoon salt)
- Evidence doesn’t support lower recommendations
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Salt and Public Policy

- Coronary Heart Disease Policy Model to quantify benefits of modest salt reduction in U.S.
- Benefit through a reduction in systolic blood pressure from 1-9 mm Hg in selected populations
- New cases of CHD decrease by 4.7 - 8.3 and stroke by 2.4 to 3.9 /10,000
- Regulatory change leads to wide benefit and is cost-effective

Bibbins-Domingo K, et al. NEJM 2010

Where is the salt?

80% in processed or pre-prepared foods

Sources of Salt in U.S. Diet

- 35% from cereal and cereal products
- 26% from meat & meat products
- 8% from milk & milk products

Top sodium sources in U.S.

1. Yeast breads
2. Chicken and chicken-mixed dishes
3. Pizza
4. Soda, energy drinks, and sports drinks
5. Cold cuts
6. Condiments
7. Mexican mixed dishes
8. Sausage, franks, bacon and ribs
9. Regular cheese
10. Grain-based desserts

Sources: Mattes et al.
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**Mediterranean Diet:**
Healthy fats and good carbs with a big side of fruits and vegetables

**Primary Prevention of Cardiovascular Disease with a Mediterranean Diet**
NEJM, Feb. 25, 2013

7447 Men and women, type 2 diabetes or at least 3 CV risk factors. 4.8 years

Compared 1) Mediterranean diet supplemented with 4 Tbsp/day of olive oil or 2) with 1 ounce of nuts/day: vs. 3) a low fat diet (the control)

Results: 288 cardiovascular events occurred: 3.8% in the olive oil group, 3.4% in the nut group, and 4.4% in the control group. (P=0.015)

**Eat about 1 ounce of nuts most days**

- 1 ounce of nuts=1/4 cup or a small handful
- But be aware of the calories...
  - 1 ounce=160-200 calories
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Vegetarian Diets

- Vegans
- Fruitarians
- Lacto-vegetarians
- Lacto-ovo vegetarians
- Pesce-vegetarians
- Pollo-vegetarians
- Flexitarians (Semi-vegetarians)

Dietary Guidelines 2010

Meet the 2008 Physical Activity Guidelines for Americans

- Children & adolescents should do 60 minutes or more of physical activity daily
- Most of that 60+ minutes should be aerobic
- Include muscle & bone-strengthening 3 days/wk (each)
- All adults should avoid inactivity...something is better than nothing!

Michael Pollan’s Three Rules

- Eat food
- Not too much
- Mostly plants

Baron’s Rules

- Eat unprocessed foods
- Eat the right amount to maintain your weight
- Eat something colorful at every meal (and every snack)
- Don’t drink calories
- If can’t make the “best” choice, make a better choice
- Be as fit as you can be: exercise daily
- Eat with your children
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For More Information

- CDC Division of Nutrition, Physical Activity & Obesity: http://www.cdc.gov/nccdphp/dnpao/index.html
- USDA National Agricultural Library: http://www.nutrition.gov/
- Center for Science in the Public Interest (CSPI): http://www.cspinet.org/
- ChooseMyPlate.gov: http://www.choosemyplate.gov/

For More Information

- FDA: How to Understand and Use the Nutrition Facts Label: http://www.fda.gov/Food/ResourcesForYou/Consumers/NFLPM/ucm274593.htm