Unit 3
Lesson 3.2—Foods and Nutrition

3.2 Introduction—My Plate Guidelines Video

eTextbook—Chapter 7: Nutrition For Life

Section 1: Carbohydrates, Fats, & Proteins

Key Terms
- **Nutrition**: the science or study of food and the ways in which the body uses food
- **Nutrient**: a substance in food that provides energy or helps form body tissues and that is necessary for life and growth
- **Carbohydrate**: a class of energy-giving nutrients that includes sugars, starches, and fiber
- **Fat**: a class of energy-giving nutrients; also the main form of energy storage in the body
- **Protein**: a class of nutrients that are made up of amino acids, which are needed to build and repair body structure and to regulate processes in the body

What Is Nutrition

Six Classes of Nutrients
- Carbohydrates (energy; sugars, starches, fiber)
- Fats (energy; main form of energy storage)
- Proteins (amino acids; build/repair body structures; regulated processes)
- Vitamins
- Minerals
- Water

A Balanced Diet Keeps You Healthy
- Eat/drink the right amounts of nutrients to stay healthy
- Excess body fat increases risk of heart disease, high blood pressure, chronic diseases / disorders linked to poor nutrition
- Diet in teens affects health in later years (obesity, heart disease, diabetes, osteoporosis, cancer)
Food Has Fuel for Your Body

- **Metabolism**: the sum of the chemical processes that take place in your body to keep you alive and active;
  - requires energy and nutrients (carbohydrates, fats, proteins provide energy)
  - Vitamins, minerals, water are nutrients needed for metabolism, but they do not provide energy

- **Calories**: the unit of measuring the energy in food

- Number of calories in a food depends on the amount of carbs, fat, and protein it contains
  - Carbohydrates = 4 calories per gram
  - Proteins = 4 calories per gram
  - Fat = 9 calories per gram
    - Ex: 100 grams of bread (mostly carbs) = 250 calories
    - Ex: 100 grams of chocolate cake (lots of fat) = 600 calories

**Carbohydrates**

- Carbs are made up of sugars
- Found in fruit, milk, cookies, potatoes
- 2 Types:
  - **Simple carbohydrates**: made up of single or double sugar molecules
  - **Complex carbohydrates**: made of many sugar molecules that are linked together
Sugars: Sweet and Simple

- **Sugars**: the simplest form of carbohydrate (*simple carbohydrate*)
- **Glucose**: a single-unit (single-molecule) sugar that circulates in your blood and provides energy for your cells
- Double sugars: two single sugar molecules that are linked together
  - e.g. **table sugar** = double sugar (called **sucrose**) that is made of **glucose** (single sugar) and **fructose** (single sugar) which are linked together
- found naturally in some foods; added to others
- **unrefined foods**
  - sweetness in fruit comes from fructose (single sugar)
  - calories in low-fat milk come from **lactose** (milk sugar)
- **refined foods**
  - candy, pop, cakes are sweetened with added sugars
  - called refined b/c it has been separated from the plant that produced it (provides energy but no nutrients)

Starches: Not So Simple

- **starches**: a type of **complex carbohydrate** (made of many sugars that are connected together); most come from plant foods
  - potatoes, legumes (beans and peas), grains (rice, corn, wheat) = good sources of complex carb
  - 45-65% of Calories in your diet should come from carbs; most of these should come from **complex carbs**

Glycogen: Storage Carbohydrate

- **Glycogen**: if you eat more carbs than your body needs, some will be stored as glycogen (your body’s quick energy reserve)
  - Made of highly branched chains of glucose which can quickly be broken down into individual glucose units to be used by body cells
  - If glycogen stores get full, body converts carbs into body fat

Fiber

- **Fiber**: a type of complex carbohydrate that provides little energy and cannot be digested by humans
- Very important for health
  - Keeps intestines healthy
  - Prevents constipation
  - Helps prevent colon cancer and heart disease
- Increases the amount of fluid and bulk in your digestive tract
- **Soluble fiber** – dissolves in water; hold water in your intestines which increases the volume of material in your digestive tract
  - Found in soft pulp of oat bran, apples, beans, some veggies
Protect against heart disease by “trapping” cholesterol from eaten food, therefore lowering blood cholesterol

- **Insoluble fibers**—do not dissolve in water; add bulk to your body’s waste
  - found in the hard, stringy part of fruits, veggies, grains (wheat bran, corn, brown rice, skins of fruits and veggies)
    - refined-grain products (e.g. white flour) are made by removing germ and bran from each grain = food lower in fiber and nutrients

### Fats
- an essential nutrient; you need fat in your diet
- eating too much or the wrong type is not good

#### What Is Fat?
- **Lipids**—fatty or oily substances that do not dissolve in water (fats belong to this class of chemical compounds)
- **Fats**—large molecules that are made up of two kinds of smaller molecules: fatty acids and glycerol
  - 3 fatty acids are linked to 1 glycerol (why fats are also called triglycerides)
  - **Fatty acids**—long chains of carbon atoms that are chemically bonded to each other and are attached to hydrogen atoms
    - Length of the carbon chains and number of hydrogen atoms attached affect how the fatty acid functions in the body (i.e. how “good” or “bad” the fat is for you)

#### Saturated Fats
- **Saturated fats**—fats that are made up of saturated fatty acids (chain of carbon atoms w/ single bonds and carbon atoms are bonded to as many hydrogen atoms as is chemically possible)
- most saturated fats are solid at room temperature
  - come from animal foods (e.g. meat, milk)
  - come from oils (e.g. coconut and palm oil)
  - meat, whole milk, butter, ice cream
  - can lead to obesity, increase cholesterol, increase heart disease

#### Unsaturated Fats
- **unsaturated fats**—fats that are made up of unsaturated fatty acids (chain of carbon atoms w/ 1+ double bonds and carbon atoms do not hold the max number of hydrogen atoms that is chemically possible)
- tend to be liquid at room temperature
  - more common in plants
- **monounsaturated fats** – unsaturated fats that contain fatty acids that have only one set of double bonded carbons
  - found in olive oil, canola oil, peanut oil
  - low risk of heart disease
- **polyunsaturated fats** – fats that contain fatty acids with more than one double bond
  - corn oil, sunflower oil, soybean oil
  - omega-3: found in fish and seafood; may provide extra protection against heart disease
- **trans fats** – unsaturated fatty acids that are formed when vegetable oils are made into hard margarines
  - increase the risk of heart disease
- total fat intake for teens should be 25-35% of total calorie intake (limit the amounts of saturated fat, cholesterol, and trans fat)

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**Cholesterol**

Cholesterol is another type of lipid (found in human and animal tissues)

- needed to make vitamin D, cell membranes, certain hormones, and **bile** (a substance that aids in fat digestion)
- body makes cholesterol, but you also get it from your diet
- combines with other molecules to circulate in the blood
  - **low-density lipoprotein (LDL)** AKA “bad cholesterol” – brings cholesterol to the body cells
    - when LDL levels in blood get too high, **plaque** forms on walls of blood vessels and blocks blood flow to the heart muscle; blood flow = heart doesn’t get enough oxygen, which causes a heart attack
  - **high-density lipoprotein (HDL)** AKA “good cholesterol” – carries cholesterol back to the liver where it is removed from the blood; high levels reduce risk of developing heart disease
- **dietary cholesterol** is found in animal tissue (e.g. meat, fish, poultry, eggs, dairy); not found in plants; can increase blood cholesterol levels (similar to saturated fat)
- high cholesterol = risk of heart / blood vessel disease

### Proteins

**Proteins:**
- muscles, skin, hair, nails are made up of mostly protein
- help build new cells and repair existing ones
- needed to help form hormones, enzymes, antibodies
- excess protein is stored as fat
- made up of chains of molecules called **amino acids**
  - linked together like beads on a necklace to make each type of protein
  - 20 different amino acids make up body proteins
    - 9 of these cannot be made in our bodies; these are called **essential amino acids** and must be eaten in your diet
    - The other 11 can be made in your body and are called **nonessential amino acids**

### Complete and Incomplete Proteins

- Protein comes from both animal and plant foods
- **Complete proteins** – most animal proteins contain all the essential amino acids (e.g. meat, eggs, dairy)
- **Incomplete proteins** – most plant proteins don’t have all the essential amino acids (e.g. legumes, grains, veggies)
- 10-35% of your calorie intake should be from protein
- You can combine foods to meet your amino acid requirement (e.g. PB sandwich)

### Review Questions

### Section 2: Vitamins, Minerals, and Water

#### Key Terms
- **Vitamin**: a class of nutrients that contain carbon and are needed in small amounts to maintain health and allow growth
- **Mineral**: a class of nutrients that are chemical elements that are needed for certain body processes, such as enzyme activity and bone formation
- **Nutrient deficiency**: the state of not having enough of a nutrient to maintain good health
**Vitamins**

- **Vitamins** – a class of nutrients that contain carbon and are needed in small amounts to maintain health and allow growth
  - Classified by whether they dissolve in fat or water; affects how they are taken into the body, used, stored, and eliminated

**Fat-Soluble Vitamins**

- Dissolve in fat and are stored in fat tissue; remain in body for long time (e.g. vitamins A, D, E, K)

<table>
<thead>
<tr>
<th>Fat-Soluble Vitamins</th>
<th>Foods that have it</th>
<th>What it does</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>milk; yellow and orange fruits and vegetables; dark-green, leafy vegetables; eggs; cheese; butter</td>
<td>keeps eyes and skin healthy; needed for growth and for strong bones and teeth</td>
</tr>
<tr>
<td>D</td>
<td>fish oils, fortified milk, liver, egg yolk, salmon, butter, tuna; produced in the body by exposure of skin to ultraviolet light (UV) in sunlight</td>
<td>promotes absorption of calcium and phosphorus in the intestine; needed for strong bones and teeth</td>
</tr>
<tr>
<td>E</td>
<td>vegetable oils, beans, peas, nuts, dark-green vegetables, whole grains</td>
<td>protects cell membranes from damage by reactive oxygen (free radicals)</td>
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<tr>
<td>K</td>
<td>leafy vegetables such as spinach, kale, and broccoli; also produced in the intestine by bacteria</td>
<td>aids in blood clotting</td>
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</tbody>
</table>

**Water-Soluble Vitamins**

- Dissolve in water; not stored in the body very well;
- do not provide energy, but are needed to release energy from carbs, fats, proteins
- each vitamin has an important function
- **antioxidant** – a substance that is able to protect body structures from a highly chemically reactive form of oxygen called a **free radical** (normal byproducts of metabolism)

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<thead>
<tr>
<th>Water-Soluble Vitamins</th>
<th>Foods that have it</th>
<th>What it does</th>
</tr>
</thead>
<tbody>
<tr>
<td>B₁ (Thiamin)</td>
<td>most vegetables, pork, liver, peas, beans, enriched and whole grains and cereals, nuts, seeds</td>
<td>needed to produce energy from carbohydrates; helps the nervous system to function properly</td>
</tr>
<tr>
<td>B₂ (Riboflavin)</td>
<td>milk; meat; eggs; whole grains; green, leafy vegetables; dried beans; enriched breads and cereals; pasta</td>
<td>needed to produce energy from carbohydrates; important for growth and healthy skin</td>
</tr>
<tr>
<td>B₃ (Niacin)</td>
<td>meat, liver, fish, enriched and whole-grain breads and cereals, peas and beans, seeds</td>
<td>needed to produce energy from carbohydrates, fat, and protein; needed for the nervous system and healthy skin</td>
</tr>
<tr>
<td>B₆ (Pantothenic acid)</td>
<td>whole grains; liver; meat; fish; bananas; green, leafy vegetables; peas; beans</td>
<td>needed to produce energy from carbohydrates, fat, and protein</td>
</tr>
<tr>
<td>B₉ (Pyridoxine)</td>
<td>whole grains; liver; meat; fish; bananas; green, leafy vegetables; peas; beans</td>
<td>needed for protein metabolism, the production of hemoglobin in red blood cells, and for the nervous system</td>
</tr>
<tr>
<td>B₁₂ (Cobalamin)</td>
<td>meat; liver; dairy products, eggs</td>
<td>necessary for forming cells (including red blood cells) and for a healthy nervous system</td>
</tr>
<tr>
<td>Folate (Folic acid)</td>
<td>green vegetables, liver, whole and fortified grains, peas, beans, orange juice</td>
<td>needed for forming cells (including red blood cells); helps prevent birth defects</td>
</tr>
<tr>
<td>Biotin (Ascorbic acid)</td>
<td>citrus fruits, melons, strawberries, green vegetables, peppers</td>
<td>necessary for metabolism</td>
</tr>
</tbody>
</table>

- **C** promotes healthy gums and teeth, the healing of wounds, and the absorption of iron; acts as an antioxidant to protect cells from damage
Minerals

Minerals – a class of nutrients that are chemical elements that are needed for certain processes (e.g. enzyme activity, bone formation)

- 20 minerals are essential in small amounts to maintain good health

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Foods that have it</th>
<th>What it does</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>milk, dairy products, dark-green, leafy vegetables, tofu, legumes, shellfish, oily fish</td>
<td>needed for development and maintenance of bones and teeth, transmission of nerve impulses, muscle contraction, blood clotting</td>
</tr>
<tr>
<td>Chromium</td>
<td>meat, dairy products, whole grains, herbs, nuts, seeds</td>
<td>helps regulate blood sugar</td>
</tr>
<tr>
<td>Copper</td>
<td>liver, shellfish, peas, beans, nuts, seeds</td>
<td>needed for the production of bone and red blood cells and the absorption of iron</td>
</tr>
<tr>
<td>Fluoride</td>
<td>tea, fish, fluoridated toothpaste and water</td>
<td>helps the strengthening of tooth enamel; helps in the prevention of cavities</td>
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<tr>
<td>Iodine</td>
<td>iodized salt, seafood</td>
<td>needed for production of thyroid hormones and normal cell function</td>
</tr>
<tr>
<td>Iron</td>
<td>red meat, whole and enriched greens, dark-green vegetables, peas, beans, eggs</td>
<td>necessary for production of hemoglobin</td>
</tr>
<tr>
<td>Magnesium</td>
<td>milk, dairy products, green, leafy vegetables, peas, beans</td>
<td>needed for bone growth, metabolism, and muscle contraction</td>
</tr>
<tr>
<td>Potassium</td>
<td>meat, poultry, fish, bananas, oranges, dried fruits, potatoes, green, leafy vegetables, peas, beans</td>
<td>needed for maintenance of fluid balance, transmission of nerve impulses, and muscle contraction</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>cereals, meats, milk, poultry</td>
<td>needed for bone formation and cell reproduction</td>
</tr>
<tr>
<td>Selenium</td>
<td>tuna, other seafood, whole grains, liver, meat, eggs</td>
<td>needed for healthy heart function, antioxidant action, and healthy thyroid function</td>
</tr>
<tr>
<td>Sodium</td>
<td>table salt, high-salt meats (ham), processed foods, dairy products, soy sauce</td>
<td>needed for the regulation of water balance in cells and tissues and for transmission of nerve impulses</td>
</tr>
<tr>
<td>Sulfur</td>
<td>meat, milk, eggs, nuts, grains</td>
<td>needed for protein metabolism</td>
</tr>
<tr>
<td>Zinc</td>
<td>seafood, meat, milk, poultry, eggs</td>
<td>needed for growth and healing and for production of digestive enzymes</td>
</tr>
</tbody>
</table>

Vitamin and Mineral Supplements

- **Nutrient deficiency** – the state of not having enough of a nutrient to maintain good health
- **Supplements** – available for those who cannot meet their vitamin or mineral needs with foods;
  - not recommended for healthy people who can meet nutrient needs with normal diet
  - make sure supplements meet, but do not exceed your needs
  - **malnutrition** – improper nutrition caused by poor diet or inability to absorb nutrients from foods (caused by too much / little of a nutrient)

Sodium

- most of us eat more salt than we need; most comes from processed foods
  - sodium + chloride = salt
- need 1/3 teaspoon per day (500 milligrams) (not to exceed 1.25 teaspoon)
- too much causes increase in blood pressure (which can lead to heart disease, stroke, kidney failure)
- electrolytes – vital for processes like muscle movement, nerve signals, transport of nutrients into and out of body cells; help control fluid levels in body
  - e.g. sodium, chloride, potassium, magnesium
Calcium

- best sources of calcium is milk and other dairy products
  - nondairy is green leafy veggies (spinach, broccoli)
  - calcium fortified foods (bread and orange juice)
- need 1300 milligrams of calcium per day (1 c. milk = 300 milligrams of calcium)
- most calcium is found in bone
- 45% of your skeleton forms between the ages of 9 and 17 so if you don’t eat enough calcium when you’re young, you have lighter, weaker bones
- Osteoporosis – a disorder in which the bones become brittle and break easily

Iron

- Iron is needed to make hemoglobin (the molecule in red blood cells that carries oxygen)
- Iron-deficiency anemia – there are not enough red blood cells or hemoglobin to carry oxygen around the body (makes you feel weak and tired)
  - one of the most common nutritional deficiencies in the world
  - not enough iron in the diet, blood cannot deliver enough oxygen to cells
- best sources are red meats (easily absorbed); green veggies are good, but not absorbed as well as red meat iron
- teen girls need 18 milligrams of iron, boys 12 milligrams daily
- too much iron is poisonous (most common forms of poisoning among young children)

Water

- you can live for many weeks without food, but only a few days without water
- 60% of your body is water
- Necessary for every function that keeps you alive
- Water is usually better during exercise than a sports drink (60 minutes long)

Eight Glasses a Day

- Lose water by excretion of urine and solid wastes, evaporation through breathing, sweat
- Extra water cannot be stored in body
- Must take in 2.5 quarts of water each day
- 8 glasses of water per day (drinks w/ caffeine / alcohol not good water sources b/c caffeine and alcohol increase the amount of water that is excreted in urine)

Dehydration is Dangerous

- Dehydration – when the body loses more water than has been taken in
  - When you don’t drink enough fluid
Lose more water than normal (exercise)
- Often happens when you’re ill (fever, vomiting, diarrhea)
- Interferes with mental and physical performance
- Symptoms: thirst, headache, fatigue, loss of appetite, dry eyes and mouth, dark-colored urine, nausea, difficulty concentrating, confusion, disorientation, death (progressively, as dehydration becomes more severe)
- Weight loss from dehydration is not fat loss (e.g. wrestling)

**Review Questions**

**Section 3: Meeting Your Nutritional Needs**

**Key Terms**
- **Recommended Dietary Allowances (RDAs):** recommended nutrient intakes that will meet the needs of almost all healthy people
- **Daily value (DV):** recommended daily amount of a nutrient; used on food labels to help people see how a food fits into their diet
- **Food Guide Pyramid:** a tool for choosing a healthy diet by selecting a recommended number of servings from each of five food groups
- **Dietary Guidelines for Americans:** a set of diet and lifestyle recommendations developed to improve health and reduce nutrition-related disease risk in the U.S. population

**How Much of Each Nutrient?**
- **Dietary Reference Intakes (DRIs)** – guidelines for how much of each nutrient we need;
  - provide four sets (we’ll only learn 2) of reference values which are guidelines that recommend amounts of nutrients and other food components needed to prevent deficiencies, avoid toxicities, and promote best health
  - recommendations for males, females, age groups, special conditions (e.g. pregnancy)

**What Are RDAs?**
- **Recommended Dietary Allowances (RDAs)** – the recommended nutrient intakes that will meet the needs of almost all healthy people
  - not exact requirements, but guidelines
- **Tolerable Upper Intake Levels (ULs)** – the largest amount of a nutrient you can take without risking toxicity

**Understanding Food Labels**
- Food labels include:
  - Nutritional facts
Info about the processing of the food
- List of ingredients

**Serving Size**
- Size of a SINGLE SERVING is shown at the top of the Nutrition Facts panel
- Amount of nutrients given below is in a serving size
- Portions you are sold is bigger than one serving

**Calories**
- Lists calories and calories from fat

**Daily Values**
- Nutrients are listed on food labels by weight and as a percentage of a 2,000 calorie diet
- Daily Values (DV) – recommended daily amounts of a nutrient that are used on food labels to help people see how a food fits into their diet
  - % of DV for a nutrient tells people the amount of this nutrient that is in a serving of the food relative to the recommended amount for a 2,000 calorie diet
  - (ex: a food that provides 10% of the DV for fiber provides 10% of the amount of fiber recommended per day for a 2000-calorie diet
  - Total fat – must be listed by weight and as a % of the DV; look for foods with low % DV for fat
  - Cholesterol – must be listed by weight and as % of DV; look for foods w/ low % DV for cholesterol
  - Sodium – listed by weight and as a % of DV; look for foods w/ low % DV for sodium (also labeled low sodium (140 milligrams or less) or reduced sodium (25% less)
  - Total carbohydrates – labels include all sugars (like milk sugar or refined sugars)
    - Fiber – given in grams and as a % of DV; choose foods labeled high fiber (20% or more of the DV) or a good source of fiber (10% or more of the DV)
  - Protein – must be listed in grams; % of DV is not usually listed

**Vitamins and Minerals**
- Calcium, iron, vitamin C, vitamin A, and some B vitamins are given on labels only as a percentage of the DV

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**Analyzing DATA**

**How to Use Food Labels**

1. **“Serving Size”** shows the amount of food that counts as one serving.
2. **“Calories”** lists the number of Calories in one serving and the number of Calories that come from fat.
3. Total fat, saturated fat, cholesterol, sodium, total carbohydrates, dietary fiber, sugars, and protein are listed.
4. **“% Daily Value”** shows the percentage of the recommended amount of the nutrient that is met by one serving of food.
5. Calcium, iron, vitamin C, vitamin A, and some B vitamins are listed.
6. Recommended daily intakes for 2,000- and 2,500-Calorie diets are listed.

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**Your Turn**

1. Calculate the percentage of Calories from fat in the food.
2. **CRITICAL THINKING** If you needed 2,500 Calories a day, what percentage of DV for fiber does a serving of this food provide?
Understanding Other Terms on Food Packaging

Ingredient List
- Ingredients in a product are listed on the label in order of weight; those present in largest amounts are listed first
- **Additives** – substances that are added to foods to keep the foods from spoiling or to improve the taste, smell, texture, appearance, nutrient content of a food

Calories
- Calorie free (less than 5 calories)
- Light or lite (1/3 fewer calories than the regular brand)
- Low calorie (no more than 40 calories)
- Reduced calorie (25% fewer calories than the regular brand)

Cholesterol
- Low cholesterol (20 milligrams or less)
- Cholesterol free (less than 2 milligrams)

Sugars
- Sugars are not always called sugar
  - Sucrose, fructose, dextrose, maltose, lactose, honey, syrup, corn syrup, high-fructose corn syrup, molasses, invert sugar, fruit juice concentrate
- Sugar free (less than .5 grams of sugar)
- No sugar added, without added, sugar, reduced sugar (25% less sugar than the regular brand)

Fats
- Fat free (less than .5 grams of fat)
- Low fat (3 grams of fat or less)
- Extra lean (less than 5 grams of fat)
- Low in saturated fat (1 gram or less) – low fat may still be high in calories

<table>
<thead>
<tr>
<th>Other Ingredients and Terms on Food Labels</th>
<th>Freshness date</th>
<th>Sell by date</th>
<th>Expiration date</th>
<th>Health and disease claims</th>
<th>Trans fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspartame, saccharine, artificial sweeteners</td>
<td>the last day a food should be used to ensure best quality</td>
<td>the last day a perishable food should be sold</td>
<td>the last date a food should be used before the chance of spoilage increases</td>
<td>(such as “May help reduce blood cholesterol”) government approved claims made about the relationship between a nutrient or food and a disease or health condition</td>
<td>a type of fat found in hydrogenated oils and may increase the risk of heart disease</td>
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<tr>
<td>Monosodium glutamate (MSG) flavor enhancer</td>
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<tr>
<td>Artificial colors (such as FD&amp;C colors)</td>
<td>food colors added to make the food look more appealing</td>
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<tr>
<td>Sulfites, BHA, and BHT food preservatives</td>
<td></td>
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<tr>
<td>Enriched</td>
<td>a food to which nutrients have been added to restore some of those lost in the processing of the food</td>
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<tr>
<td>Fortified</td>
<td>a food to which nutrients have been added</td>
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<tr>
<td>Treated by irradiation</td>
<td>food that has been exposed to radiation to kill microorganisms and slow ripening and spoilage</td>
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<tr>
<td>Pasteurized</td>
<td>food that has been heated to kill disease-causing organisms (seen on the labels of products such as milk, apple juice, and eggs)</td>
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<tr>
<td>Genetically modified</td>
<td>a food whose genes have been modified to produce desirable characteristics</td>
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<td>Organic</td>
<td>a food produced under certain standards without the use of synthetic pesticides or fertilizers</td>
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<tr>
<td>Functional food</td>
<td>food that provides a health benefit beyond that provided by the traditional nutrients it contains</td>
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The Food Guide Pyramid

**Food Guide Pyramid** – visual tool for planning your diet that divides foods into six food groups

- Shows the number of servings needed from each group to make a healthy diet

**A Closer Look at the Food Guide Pyramid**

- Pyramid is divided into 6 categories
Dietary Guidelines for Americans

- **Dietary Guidelines for Americans** – a set of diet and lifestyle recommendations developed to improve health and reduce nutrition-related disease risk
- Organized into 3 parts AIM FOR FITNESS, BUILD A HEALTHY BASE, CHOOSE SENSIBLY

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### Milk, Yogurt, and Cheese Group

**2–3 servings per day**

Foods in the milk, yogurt, and cheese group give you a large amount of calcium. These foods also give you protein, vitamins A and D, and other minerals. Choose carefully—foods in this group can also be high in saturated fat, and cholesterol. Choose lower fat items to reduce the amount of saturated fat and cholesterol in your diet. All dairy foods are in this group.

**Examples of one serving:**
- 1 cup milk or yogurt
- 1 1/2 oz natural cheese
- 2 oz processed cheese
- 1 cup frozen yogurt
- 2 cups cottage cheese

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### Meat, Poultry, Fish, Dried Beans, Eggs, and Nuts Group

**2–3 servings per day**

Foods in this group are high in protein, B vitamins, and minerals. However, because these foods are mostly from animals, they can be high in saturated fat and cholesterol. Choose leaner cuts of meat. Fish and poultry are more healthful when the skin has been removed. Dry beans are a healthful choice because they are low in fat, contain no cholesterol, and are a good source of fiber.

**Examples of one serving:**
- 2 to 3 oz cooked lean meat, poultry, fish, or seafood
- 1 to 1 1/2 cups cooked dry beans
- 4 to 6 Tbsp peanut butter
- 2 eggs

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### Fats, Oils, and Sweets

**Use sparingly**

At the top of the pyramid are foods that are low in nutritional value because they are high in fat or sugar.

Table sugar and sweeteners, such as honey, molasses, and maple syrup, are part of this group. So are high-sugar foods, such as soda and candy. High-fat foods, such as oils, butter, margarine, most salad dressings, and mayonnaise, also belong in this group. Foods in this group should be eaten less often.
Know the ABCs for Good Health

Aim for fitness
1. Aim for a healthy weight.
2. Be physically active each day.

Build a healthy base
3. Let the food Guide Pyramid guide your food choices.
4. Choose a variety of grains, especially whole grains, on a daily basis.
5. Choose a variety of fruits and vegetables daily.
6. Keep food safe to eat.

Choose sensibly
7. Choose a diet that is low in saturated fat and cholesterol and moderate in total fat.
8. Choose beverages and foods to moderate your intake of sugars.
9. Choose and prepare foods with less salt.
10. Adults who drink alcohol should do so in moderation.

The Dietary Guidelines for Americans also recognize the importance of activity and other lifestyle factors in maintaining good nutrition and overall health.

Review Questions

Section 4: Choosing a Healthful Diet

Key Terms
- **Nutrient density**: a measure of the nutrients in a food compared with the energy the food provides
- **Vegetarian**: a dietary pattern that includes few or no animal products

Simple Steps to a More Healthful Diet

Is Junk Food a Problem?
- Key to whether a food is a healthy food or a junk food is how many nutrients it provides relative to how many Calories it contains
  - Junk is usually high in calories, large amounts of fat, sugar, salt, but contain few other essential nutrients
  - Have a low **nutrient density** – a measure of the nutrients in a food compared with the energy the food provides (“empty calories”)
- Moderation and Balance – junk food is only a
problem if it makes up a large part of your diet

- Some foods may be healthy (slice of pizza = veggie, grain, dairy) (taco = meat, veggie, cheese, bread) but be careful about added fat

**Choose the Right Snacks**

- Snacking isn’t bad when done right; it increases nutrient intake and helps you maintain a healthy weight

**Nutrition Throughout Life**

**A Healthy Start in Infancy**

- Milk from mother or a bottle
  - Breast-fed is best—right mix of nutrients, calories, and substances that protect from infections
  - Formula-fed – designed to provide the same nutrients as breast milk does; works until about 6 months of age, but is higher in fat
- After 4-6 months, infant’s diet can include soft foods
- Healthy 1-year-old should have tripled weight since birth

**Continuing Good Nutrition in Childhood**

- 2-years old plus, use the food pyramid, but choose smaller servings
- Amount to eat depends on size, growth rate, activity level

**Teens Need to Eat Right to Grow**

- Teen diets are often low in important nutrients like calcium, iron, folate, riboflavin
  - Teens tend to eat meals away from home or skip meals altogether
  - Tend to drink too little milk and too much pop
- Body needs more energy, protein, vitamins, minerals b/c of growth spurts
- Teen boys need to eat higher number of recommended servings
- Teen girls should eat in the middle range (unless they are very active)
- Choose foods to meet nutrient needs and not exceed energy needs (plenty of nutrient-dense foods)

**Adults Aren’t Growing**

- Number of calories a person needs to maintain healthy weight decreases as you get older b/c you stop growing
- Adults should take in 20-35% fat from calories

**Special Dietary Needs**
Special Requirements of Athletes
- Athletes need extra energy and water
- Need a diet high in carbs (for quick energy) – high in complex carbs, rich in B vitamins
- Athletes do not need to eat large amounts of protein to build larger muscles (you get enough from your normal diet)
  - Weight training + well balanced diet = build muscle
  - Protein from eat is good source of iron (used to carry oxygen to tissues and prevent muscle fatigue)
    - Female athletes be extra careful to get enough iron b/c iron is lost each month during menstruation

Athletes Must Eat and Drink to Compete
- Eat a high-carb snack (e.g. half a bagel, handful of low-salt pretzels, yogurt and fruit) about 2 hours before exercising
- Drink sports drinks containing 6-8% sugar or a 100-300 calorie snack during the event to maintain blood glucose levels (if the exercise lasts longer than 60 minutes)
- Even mild dehydration can hurt athletic performance (blood loses water and thickens which makes pumping blood to muscles more difficult) – not good form for wrestlers

Nutrient Supplements
- Dietary supplements are not necessary for optimal athletic performance
  - Can be dangerous and should be used w/ caution
  - Not regulated by FDA
  - May contain ingredients that are banned by athletic associations
- Meet needs w/ a well-balanced diet

Eating Well During Pregnancy
- Food choices must meet nutrient needs of mom and baby
- Pregnant women need up to 450 additional calories
- Add protein, vitamin B6, B12, folate (folic acid), iron, zinc
  - Additional folate important before and very early in pregnancy to prevent certain birth defects
  - Usually need to supplement folic acid and iron (but consult a doctor!)
Eating Well During Poor Health

- Drink plenty of fluids (have a cold, breathing through mouth, lose extra fluids; vomiting, diarrhea, fevering) – prevent dehydration
- Long term illness, energy and nutrient intake is very important for fighting disease
- Diet helps manage chronic disease (e.g. diabetes – balance carbs with insulin to keep blood sugar healthy)

Choosing a Vegetarian Diet

- **Vegetarian diet** – few or no animal products are eaten (little meat, poultry, fish, dairy, eggs)
- **Semivegetarian** – may not eat red meat, but eat others
- **Lacto-ovo vegetarian** – no meat but will eat eggs / dairy
- **Vegans** – don’t eat any animal products
- Plant based diet usually provides more fiber, vitamin A, vitamin C; it is low in saturated fat and cholesterol (reduce risk of heart disease)

Protein in a Meat-Free Diet

- Vegans must choose more carefully to meet their needs (amino acids and proteins)

Meeting Other Nutrient Needs

- Vegans may be low in iron, zinc, calcium, vitamin D, vitamin B12,
  - Beans, dried fruits, green leafy veggies, tofu, enriched cereals, grains, whole grains, dried beans, nuts, other sources of calcium (spinach, green leafy veggies, dried beans, fortified cereals) exposure to sunshine

Review Questions

Web Resources

- **Reading Food Labels** (optional—you’ll need to be able to apply this information)

- **Choose My Plate**—Review the information on this site. You’ll actually be creating a profile and log in information to use the Super Tracker. At this point note the type of information provided – what are the tabs and topic areas?

- **Calculate BMI**
  - What is the BMI measurement (define BMI)
  - What is the formula? (how is BMI calculated?)
- What is your BMI?

- What are the concerns/limitations for teens?