24 Nutrition, Metabolism, and Body Temperature Regulation

MyPyramid

24 Nutrition, Metabolism, and Body Temperature Regulation

Grains, Vegetables, Fruits, Milk, Meat, Beans

Nutrients
- Carbohydrates: (250 g daily) - Main source of energy; fiber confers many health benefits.
- Proteins: (100 g daily) - Major structural building blocks.
- Fat: (75 g daily) - Energy storage; synthesis and repair of cell parts.
- Water: (2000 mL daily) - Solvent; lubricant; medium for transport and temperature regulation.
- Vitamins: (800 mg daily) - Enable chemical reactions in the body.
- Minerals: (5-10 g daily) - Aid enzyme function; electrical balance; generate nerve impulses; bone structure.

Function in the Body

Nutritional Content of a Well-Balanced Diet

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Daily Requirement</th>
<th>Role in the Body</th>
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6 Major Nutrients - Main Cellular Uses

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<th>Nutrient Type</th>
<th>Uses in the Body - pg. 912</th>
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| Carbohydrates | - Complex = Continuous: - Vegetables  
|               | - Whole Grains  
|               | - Beans  
|               | - Glycogen  
|               | - Starch  
|               | - Dextrose  |
|                | *Simple = Spike: - Fruit  
|                | - White flour pasta, bread, tortillas  
|                | - Sugar, honey  
|                | - Sweets  
|                | - Fructose, lactose, maltose, sucrose, glucose  |

Table 24.1 - Dietary Sources

Saturated vs. Unsaturated Fats

Trans fat FACTS

What are trans fats?

- Trans fats are created when food manufacturers add hydrogen to vegetable oil. This process, called hydrogenation, increases the shelf life and flavor of many foods.

Why are trans fats bad?

- Trans fats, along with saturated fats, raise the cholesterol level in your blood. High cholesterol levels contribute to heart disease.

What foods contain trans fats?

- Water and refined foods contain high amounts of trans fats. These are the fats to avoid, or eat in moderation.

Uses in the body - pg. 914
*complete - meet the body’s amino acid requirements for tissue maintenance and growth

**COMPLETE** vs. **INCOMPLETE**

- complete: milk, eggs, meat, beans, peas, nuts
- incomplete: vegetables, fruits, oats, bread, rice

Uses in the body - pg. 914-915

*incomplete - missing one or more essential amino acid

Table 24.2

- absorbed along with water from the gastrointestinal tract
- *coenzymes
  - vitamin A group
  - vitamin C
  - *antioxidant, improves iron absorption, detox, collagen synthesis
  - vitamin A
  - *vision, protects cell membranes, antioxidant
  - vitamin D
  - *acts like hormone, promotes bone growth
  - vitamin E
  - *antioxidant, protects cell membranes
  - vitamin B
  - *blood clots, ETC

*bind to ingested lipids and are absorbed along with their digestion products

Minerals - Table 24.3

*energy balance means intake equals output

Energy intake (Calories eaten)

more intake = weight gain

Energy expenditure (Calories burned)

more output = weight loss

*lost as heat, used to do work, stored as fat

Regulation of Food Intake - It’s COMPLICATED...

here’s what you need to know

- ghrelin, hunger
  - *same with increasing levels of glucagon and epinephrine
- leptin, hunger
  - *same with increasing levels of insulin and CCK
Basal Metabolic Rate (BMR) - energy the body needs to perform only its most essential activities (i.e. breathing, resting levels of organ function).

Mechanisms of Heat Exchange - Heat Loss
- Convective heat - hot air rises, cold air sinks
- Conductive heat - transfer of heat from warmer to cooler

Body Temperature Regulation
- Colder skin - hypothalamic center
- Warmer skin - peripheral sympathetic nervous system
- Warm-blooded animals
- Skin temperature
- Blood flow to skin

Total Metabolic Rate (TMR) - BMR + all ongoing activities
- Physical activity
- Diet processing
- Overall metabolic rate
- Physical activity
- Elective

The Negative Effects of Obesity on Your Health and Your Life
- Low self-esteem
- Depression
- Limited mobility
- Social discrimination
- Arthritis
- High cholesterol
- Type 2 diabetes
- Bone problems
- Increased sweating
- High blood pressure
- Heart attacks
- Cancer
- Joint problems
- Fewer employment opportunities
- Hernia
- Deep vein thrombosis
- Lower life expectancy

Even at rest your body burns lots of calories due to your basal metabolic rate! "energy cost of living"