Nutrition, Food and Fitness
Chapter 10
"Water: The Forgotten Nutrient"
Page 172

Water is an essential nutrient that must be replaced every day. Depending on your state of health, you may be able to survive 8 to 10 weeks without food, but you can only survive a few days without water.

https://www.scientificamerican.com/article/how-long-can-the-average/

Dec 3-12:11 AM

For most humans, body weight is about 50 to 70% water (~10 to 12 gallons).

Water is in every body cell.

Fat tissue is about 20 to 35% water.

Muscle tissue is about 75% water.

Body fluids include saliva, blood, lymph, digestive juices, urine and perspiration. Water is the main component in each of these fluids.

Dec 3-12:20 AM

The Functions of Water

1. Facilitates Chemical Reactions

Most chemical reactions in the body need water to take place.

Water is a reactant in many chemical reactions. A reactant is a substance that enters into a chemical reaction and is changed by it. Water is a product in other reactions.

2. Transports Nutrients and Waste Products

Water is a solvent. Solvents are liquids in which substances can be dissolved.

Water can dissolve most substances and water-based blood transports them to the cells.

amino acids, glucose, minerals, water-soluble vitamins

Blood carries dissolved wastes away from cells. Water also plays a role in removing wastes from the body through perspiration, exhaled water vapor, urine and feces.

Dec 3-12:18 AM

3. Lubricates Surfaces

A lubricant is a substance that reduces friction between surfaces.

Water is an excellent lubricant in your body.

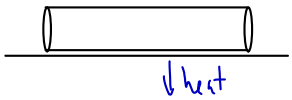
- water in saliva lubricates food as you swallow it
- tears lubricate your eyes
- fluids surround your joints to keep bones from rubbing together

4. Regulates Body Temperature

Blood and perspiration are the body fluids responsible for regulating body temperature.

normal body temperature : 98.6°F (37°C) → + 5°F / - 5°F → serious health problems → higher / lower → death

Blood distributes body heat. When you become warm, the blood vessels near your skin surface expand. The expanded blood vessels allow more blood to flow near the skin surface releasing heat into the air.



Perspiration produced by sweat glands transmits heat from your body through pores in your skin surface. The evaporation of water in perspiration helps cool your body.

When your body temperature drops, your body constricts the blood vessels near the surface of the skin. It restricts the amount of blood flowing near the surface of your skin so less heat is lost.

Dec 3-12:38 AM

Keeping Fluids in Balance

1. There needs to be a balance between water intake and water excretion.

2. There needs to be a balance between the water inside cells and the water outside cells.

Intracellular water is water inside the cells. Extracellular water is water outside the cells.

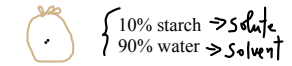
Water can move freely across cell membranes. The concentration of sodium, potassium and chloride inside and outside the cells determines the movement of water.

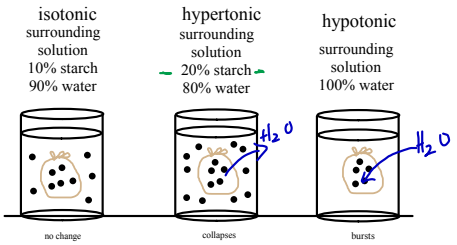
Dec 3-1:00 AM

hypotonic solution - contains a lower concentration of dissolved solutes than a solution to which it is being compared

hypertonic solution - contains a higher concentration of dissolved solutes than a solution to which it is being compared

isotonic solution - contains the same concentration of dissolved solutes than a solution to which it is being compared





too much water inside a cell -> it could burst
too little water inside a cell -> it could collapse

Dec 3-1:19 AM

Source of the Body's Water Supply

Most people need 2 to 3 quarts of water per day to replace body fluids.

*Drinking fluids generally supplies the greatest amount of body fluids. Plain water is a pure source, but milk, soft drinks, juices, broth, tea and other liquids also have a high water content.

*Foods supply almost as much of your daily needs as liquids. Most foods contain some water.

Water Content of Some Foods - Page 177

*Roughly 12% of your water needs are met through metabolism. Water is released when carbohydrates, fats and proteins are broken down in the body. The water can then be used in other chemical reactions.

Dec 3-1:37 AM

Factors That Increase Water Loss

- hot weather

- warm work or living environments

- dry climates (quick skin evaporation)

- use of diuretics (substances that increase urine production)
  -> caffeine and alcohol are examples

- illness
  -> diarrhea, vomiting, bleeding and high fever
  -> tissue damage caused by burns

- exercise

Dec 4-1:04 AM

Water Intoxication

You can drink too much water. The result is a rare condition called water intoxication (hyperhydration or water poisoning).

Large quantities of plain water can dilute the concentration of electrolytes in the extracellular fluid. If electrolyte levels stay low, symptoms such as headache and muscle weakness may occur. Severe cases can cause death.

low sodium
nerve swelling
headache
feeling poorly

seizure → coma → death

https://www.youtube.com/watch?v=t1nwSuWr_q8

Dec 4-12:54 AM

Bottled Water Versus Tap Water

Do you prefer bottled water or tap water?

bottled	tap

Some reasons for choosing bottled or tap water:

bottled	tap
taste easy cleaner	environment cheaper taste plastic testing

Dec 3-11:24 PM

Some reasons for choosing bottled water over tap water:

- tastes better than tap water - no "mineral" taste
- concerns that tap/well water has contaminants
- well water is more likely to contain mircoorganisms

Some reasons for choosing tap water over bottled water:

- tap water is less expensive
- bottled water is no healthier than safe, clean tap water

Some people may choose to use filtration systems to treat tap water. They vary in cost and require upkeep or filter replacement from time to time. They vary in what they filter from water. Some remove certain harmful contaminants others may only improve the taste of water.

Δ

Dec 3-11:24 PM

Prepare a "Nutrition News" report identifying the functions (5), daily requirements (5), food sources (state the amount found in a serving) (5), symptoms of a deficiency (5) and symptoms of an excess (5) for the mineral.
In your presentation include a test or slide with notes for the class to copy. (5)
Creativity (5)
Formatting (5)
Due: December 13th

Dec 11-12:38 PM

Minerals in Our Food Functions in the Body & Food Sources Video & Lesson Transcript Education

https://youtu.be/v9wBF60-Wj8

worksheets for Chapter 9

A, B, C & D

Dec 21-3:19 PM

Macrominerals - major minerals required in amounts of 100 or more milligrams per day

*Calcium
*Phosphorus
*sulfur
*sodium
*Magnesium
*Potassium
Chlorine

Microminerals - trace minerals required in amounts of less than 100 milligrams per day

*Iron
*zinc
*Iodine
*Fluoride
Selenium
Copper
Chromium
Manganese
Molybdenum

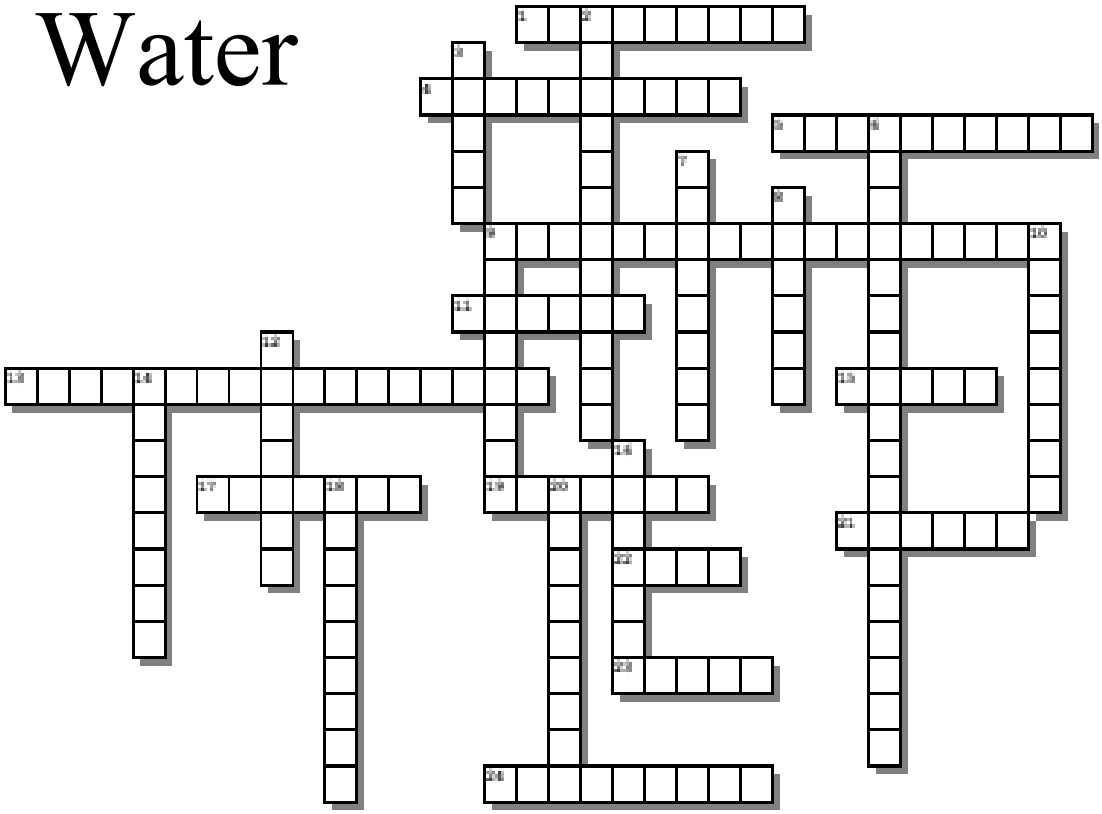
Dec 11-12:43 PM

Effects of Water Loss

Handout

Dec 4-1:09 AM

Water



Dec 8-12:01 AM

Handout: Review -> Water

Dec 8-12:09 AM

Apr 22-8:58 AM