

2/22 Biology Notes

Nutrition:

- Animals and Fungi are heterotrophic (gets nutrients and energy from plants)
- Plants are autotrophic (gets nutrients and energy from sun)

What does this mean?

What is the difference between needing materials and needing energy?

Types of Nutrients for animals:

- Inorganic
 - minerals (metals and ions)
 - water
- Organic (things that basically come from other organisms)
 - carbohydrates
 - lipids
 - proteins
 - vitamins

Q: On average, an adult human can survive for about **a few weeks** without food and **a few days** without water

What are these nutrients used for?

- Carbohydrates: energy
- Lipids: energy, cellular material, insulation
- Proteins: cellular material
- Vitamins and Minerals: molecules/ cellular material

Background Terminology:

Q: A calorie is a measure of:

A: energy

- A calorie is the amount of energy required to raise 1 gram of water 1 degree Celsius
- Food calories = 1,000 calories
Calories (capital "C") (how much energy something has)

- Human energy consumption
 - The average human:
 - At rest - 70 Calories/hour
 - During exercise up to 20 Calories/minute

- Essential versus Non-essential
 - If an organism cannot make a particular compound that compound must be obtained through eating and is considered essential
 - Non-essential is what you can make out of breaking substances down within the body so not required to get it through eating

- Human Essential versus Non-essential
 - Essential fatty acids (3) [need large quantities]
 - Essential amino acids (8 to 9) [need large quantities]
 - Vitamins (13)
 - Minerals (many)

- Important Concepts in Digestion:
 - **Intracellular** digestion is very important in protozoans and sponges
 - **Extracellular** digestion outside the cell, but also effectively outside the organism
 - Fig 34-6
 - Digestive systems:
 - Complete (2 openings)
 - allows parts of system to be specialized
 - materials moves through pattern
 - Incomplete (1 opening)
 - no specialization
 - Fig 34-7/8
 - What difference does it make?
 - The digestive system involves several different processes
 - Does the order make a difference?

Digestive systems perform five functions:

1. Ingestion
2. Mechanical breakdown
3. Chemical breakdown
4. Absorption
5. Elimination

The digestive systems of animals are very diverse, why?

- Different types of food require different structures
- Different sized of food require different structures
- The same food can be digested using different strategies/approaches