



UDS

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Se hizo Contenido
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Organic Chemistry is of fundamental importance in nutrition, since it studies compounds based on carbon (C), which are the very essence of food and the biological processes that sustain life. All macronutrients (carbohydrates, lipids and proteins) and most micronutrients (vitamins) are organic compounds whose structure, function and metabolism are the subject of study in this branch of chemistry.

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2.2 Lipids: Reserve energy and membrane components lipids are a heterogeneous group of organic molecules that are defined by their insolubility in water. Its organic importance includes:

Fatty Acids: They are hydrocarbon chains with a terminal carboxyl group (-COOH). The saturation (presence of double bonds) in its organic structure dictates its physical state (solid or liquid) and its impact on cardiovascular health.

- **Triglycerides:** The most common form of fat in the body and food, made up of three fatty acids linked to a molecule of glycerol (an organic alcohol). They serve as the main energy reserve.

- **Phospholipids:** Organic compounds with polar and hydrophilic heads (composed of glycerol, phosphate and a nitrogenous base) and hydrophobic tails (fatty acids). They are the building blocks of cell membranes.

2.3. Proteins: Structure, function and catalysis proteins are complex organic polymers formed by the union of amino acid through peptide bonds. Its role is twofold:

- **Structural:** They form tissues (collagen, keratin).

- **Functional and Regulatory:** They act as enzymes (catalysts of organic reactions of metabolism), hormones and antibodies.

- **Amino acids:** They are the organic key; Each one has an amino group (-NH_2), a carboxyl group (-COOH) and a lateral group (-R), the latter being the one that confers the identity and chemical properties to the protein.

1.1. Definition and scope

Organic chemistry focuses on the study of compounds that contain carbon, especially those that make up the molecules of living beings. In the context of nutrition, it is crucial because:

- Identify the chemical structure of the nutrients we ingest.
- Explains how these molecules are transformed (metabolism) within the body to obtain energy or build and repair cellular structures.
- Clarifies interactions between food and the body at a molecular level.

2. Macronutrients: The energy and organic structural base macronutrients are those that the body needs in large quantities to obtain energy and building materials. They are all organic molecules.

2.1. Carbohydrates: Cellular fuel carbohydrates (carbohydrates or carbohydrates) are polyhydroxylated aldehydes or ketones, $\text{C}_n(\text{H})_{2n}(\text{O})_n$. Its organic relevance lies in:

- Monosaccharides (e.g. glucose, fructose): They are the simplest organic units, the main source of immediate energy. Glucose is the universal fuel and its cyclic and linear structure (organic chemistry) determines its reactivity.
- Disaccharides and Polysaccharides (e.g. starch, cellulose): They are formed by the covalent bond of monosaccharides; the way these organic monomers are linked (α or β-glycosidic bonds) determines their digestibility and function (stored energy vs. dietary fiber).

3. Organic Micronutrients: The vital Regulators

3.1. Vitamins: Essential Coenzymes vitamins are defined as essential organic compounds, required in small quantities, that the body cannot synthesize on its own.

- Chemistry of vitamins: Their classification (water-soluble such as Vitamin B and fat-soluble such as Vitamin A , Vitamin D , Vitamin E , Vitamin K) depends on their organic structure and their affinity for water or fat, which affects their absorption and storage.

- Regulatory Function: Many vitamins act as coenzymes or organic cofactors, which bind to enzymes to facilitate metabolic reactions crucial for life (e.g. niacin or forms an electron transporter in cellular respiration).

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