A healthy diet is typically composed of macronutrients, micronutrients, and fluids. When consumed in balance, it normally meets the body's daily metabolic requirements.

Nutrition Basics

Basic Components of a Healthy Diet

Macronutrients

Macronutrients are substances needed for growth, metabolism, and other natural bodily functions. These nutrients are normally consumed in large quantities to provide bulk energy and building materials for the body. The metabolism of macronutrients depends on the provision of sufficient micronutrients.

Macronutrients are composed of:

- **Carbohydrates** are organic compounds classified according to the number of saccharides, including monosaccharides, disaccharides, and polysaccharides, which consist of carbon, hydrogen, oxygen. They have numerous roles in living organisms, including energy production, and structural and backbone support of RNA. Carbohydrates are essential for the central nervous system, heart, kidneys, and muscles to function properly. Approx. 45 to 65 percent of daily calorie intake should be provided by carbohydrates.
- **Lipids** serve a number of functions in the body, including being a dense source of energy storage, acting as structural components of cell membranes, supporting cellular development, helping with nerve cell transmission, providing insulation to retain body heat, and aiding in absorption of the fat-soluble vitamins A, D, E, and K. Other lipids influence cellular signaling, can regulate gene expression, serve as a marker for cellular recognition or modulate lipid mediators. Fatty acids are the key constituent of lipids and are classified according to structural characteristics, including the length of the carbon chain, presence and position of double bonds in the chain, and their configuration (e.g. cis vs. trans). They may be classified as saturated (no double bond), mono-unsaturated (one double bond), or poly-unsaturated (more than one double bond).

Proteins, composed of one or more chains of amino acids, are the primary source of nitrogen, provide essential nutrients for the body, and offer structural support including keratin for skin and hair, collagen for connective tissues, elastin, actin and myosin for muscles, and glycoproteins for cell membranes. Proteins also serve a functional role as enzymes; hormones for metabolic regulation; hemoglobi and transferrin for transport of oxygen and iron; albumin to regulate blood volume; antibodies for the immune system. Amino acids are divided into three types, which are:

- **Essential Amino Acids** which cannot be produced by the body and must be obtained through food
- **Conditional Amino Acids** which cannot be produced by the body during special conditions such as illness.
- **Non-Essential Amino Acids** which can be synthesized by the body

Micronutrients

Micronutrients are required for the maintenance of normal metabolism and antioxidant status. These nutrients are necessary for the efficient utilization of macronutrients.

Micronutrients include vitamins, minerals, and trace elements:

- **Vitamins** are categorized as water or lipid soluble. Water soluble vitamins require regular replacement in the body, while lipid soluble vitamins are stored in the liver and fatty tissues, and are eliminated more slowly:
    - **Water soluble vitamins** include vitamins B and C. B vitamins function in metabolism of carbohydrates, proteins, lipids, and nucleic acids, thereby contributing e.g. to energy production, neurotransmission, and the formation of red blood cells. Vitamir C acts as an antioxidant helping to protect cells from the damage caused by free radicals.
    - **Lipid soluble vitamins** include vitamin A, D, E, and K. Vitamin A is an integral component for the rod and cone cells in the eye, and is essential for cell differentiation and reproduction, particularly during embryogenesis. D vitamins exhibit various functions, especially in the maintenance of calcium balance and bone health. Vitamin E is a potent antioxidant and free radical scavenger. Vitamin K is needed for proper functioning of the coagulation cascade.
- **Minerals** include calcium, magnesium, phosphorus, potassium, and sodium. They are inorganic substances required for body processes. Minerals have many different functions such as fluid regulation, bone structure, muscle movement, and nerve functioning.
- Important **traceelements** required by the body include:
    - **Iodine** is a constituent of the thyroid hormones, thereby influencing energy metabolism, cell growth processes and fetal development.
    - **Iron** assures that hemoglobin and myoglobin work properly to bind oxygen.
    - **Selenium** is involved in antioxidant protection and is important in thyroid hormone conversion.
    - **Zinc** is a key micronutrient for metabolic pathways, stabilization of cell membranes, and immunofunction.

Water

Water is quantitatively the most important component of the human body, accounting for 50 to 60 percent of body weight, distributed in intra- and extracellular fluid compartments. The proper amount of water to a body allows body processes such as blood flow and the lymph system to function smoothly, making water a critical nutrient for health and survival.

Body processes in which water is involved, include e.g.:

- Fluid balance
- Nerve impulses
- Muscle contractions
- Nutrient transport
- Removal of wastes
- Chemical reactions
- Dissemination of heat