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Macronutrients

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Macronutrients are nutrients that the body requires in large amounts to provide energy, support growth, maintain body functions, and promote overall health. The three primary macronutrients are **carbohydrates, proteins and fats**. These nutrients are essential for life because they supply calories and perform vital physiological functions. A balanced intake of macronutrients is necessary for maintaining good health, preventing nutritional deficiencies and reducing the risk of chronic diseases.

Carbohydrates

Carbohydrates are the body's primary source of energy. They are broken down into glucose, which is used by cells to produce energy. Carbohydrates provide **4 calories per gram** and should contribute approximately **45–65% of total daily energy intake**.

Carbohydrates are classified into:

- **Simple carbohydrates:** Sugars found in fruits, milk, honey, and sweets.
- **Complex carbohydrates:** Starches and fiber found in whole grains, legumes, vegetables and cereals.

Functions of carbohydrates include:

- Providing energy for daily activities.
- Supporting brain function, as glucose is the brain's preferred fuel.
- Preventing protein breakdown for energy.
- Aiding digestion through dietary fiber.

Major sources include rice, wheat, maize, potatoes, fruits, vegetables and legumes.

Proteins

Proteins are known as the building blocks of the body. They are composed of amino acids, which are essential for growth, tissue repair, enzyme production and immune function. Proteins also provide **4 calories per gram** and should contribute **10–35% of daily energy intake**.

Proteins are classified as:

- **Complete proteins:** Contain all essential amino acids (e.g., eggs, milk, fish, meat).
- **Incomplete proteins:** Lack one or more essential amino acids (e.g., cereals and some plant foods).

Functions of proteins include:

- Growth and maintenance of body tissues.
- Formation of enzymes, hormones and antibodies.
- Transportation of nutrients and oxygen.
- Supporting immune system function.

Good protein sources include milk, eggs, fish, meat, poultry, pulses, soybeans, nuts and seeds.

Fats

Fats are the most concentrated source of energy, providing **9 calories per gram**. They are essential for energy storage, insulation and absorption of fat-soluble vitamins (A, D, E and K). Fats should contribute about **20–35% of daily energy intake**.

Types of fats include:

- **Saturated fats:** Found in butter, ghee and fatty meats.
- **Unsaturated fats:** Found in vegetable oils, nuts, seeds and fish.
- **Trans fats:** Found in processed and fried foods; should be minimized.

Functions of fats include:

- Providing a concentrated source of energy.
- Protecting vital organs.
- Supporting cell membrane structure.
- Assisting in hormone production.
- Enhancing the absorption of fat-soluble vitamins.

Healthy fat sources include olive oil, mustard oil, groundnut oil, nuts, seeds, avocados and fatty fish.

Importance of Balanced Macronutrient Intake

A balanced diet should contain appropriate amounts of carbohydrates, proteins, and fats. Excess or deficiency of any macronutrient can lead to health problems such as obesity, malnutrition, cardiovascular diseases, or impaired growth. Individual requirements vary according to age, sex, physical activity and physiological conditions such as pregnancy and lactation.

Conclusion

Macronutrients are fundamental components of a healthy diet. Carbohydrates provide energy, proteins support growth and repair and fats contribute to energy storage and essential body functions. Adequate and balanced consumption of all three macronutrients is crucial for maintaining optimal health, supporting physical performance and ensuring proper growth and development throughout life. A well-planned diet rich in diverse food sources can help meet macronutrient needs and promote overall well-being.

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