

28/12/25

Ch-10

Nutrition (Nutrition in General)

Notes:-

Nutrition: Nutrition is the process by which living organisms obtain food and utilize it for energy, growth, repair, maintenance, and protection of the body.

Nutrients: The essential organic and inorganic substances present in food are called nutrients. They act as fuel and undergo oxidation to release energy required for life processes.

Nutrition supplies proteins, carbohydrates, fats, mineral salts, vitamins, and water, which are required for proper functioning of the body.

Need for Nutrition:-

Living organisms require nutrition for the following purposes:-

- Growth, which involves formation of new cells and tissues.
- Repair of worn-out or damaged cells.
- Energy for respiration, movement, circulation, digestion, and excretion.
- Maintenance of chemical composition of cells and tissues.
- Formation of enzymes, hormones, and body secretions.

- Protection against diseases by improving immunity.

Terms related to Nutrition:-

Food: Any substance eaten or drunk which provides nutrients.

Diet: It is the combination of food items taken in meals.

Meal: It is the food taken at one time to satisfy appetite.

Appetite: It is the desire to eat food.

Hunger: It is the uneasy sensation caused by lack of food.

Balanced diet: It is a diet containing all the principal constituents of food in proper quantity.

Factors affecting a Balanced diet:-

A balanced diet depends on:

- Age of the person.
- Gender of the individual.
- Nature of work performed.
- Special conditions such as illness, pregnancy, and lactation.

Classes of Nutrients:-

Food substances are classified into 6 classes: Carbohydrates, Fats, Proteins, Mineral salts, vitamins, water.

Carbohydrates: It contains C, H, O . The ratio of hydrogen to oxygen is 2:1. They are the main source of energy.

One mole of glucose releases 686 Kilocalories of energy.

Sources: Cereals such as wheat, rice, maize, ~~potatoes~~, sugar, honey, banana, papaya, melon.

Deficiency: Weakness and retardation of growth.
Excess: ~~Obesity~~ Obesity.

Types of Carbohydrates:-

Sugars:- They are soluble in cold water and taste sweet.

Sugars are of 2 types -

• Monosaccharide (simple) sugar:-

Its chemical formula is $C_6H_{12}O_6$.

They are absorbed directly.

It is of 3 types:-

Glucose is grape sugar and blood sugar.

Fructose is fruit sugar.

Galactose is found in milk.

• Disaccharides (double) sugar:-

Its chemical formula is $C_{12}H_{22}O_{11}$.

They require digestion.

Sucrose = glucose + fructose.

Maltose = glucose + glucose.

Starch: It is an insoluble carbohydrate. Its chemical formula is $(C_6H_{10}O_5)_n$. Its sources are potatoes, grains, and bread.

Cellulose: It is an insoluble polysaccharide found in plant cell walls. It is not digested in humans.

It provides roughage, which

• helps movement of intestine.

• prevents constipation.

• aids removal of undigested food.

Glycogen: It is animal starch. It is stored in the liver and muscles.

Fats: ~~They~~ They are composed of carbon, hydrogen, and oxygen. They are made up of fatty acids and glycerol.

Sources: Butter, ghee, milk, cheese, oils, egg yolk, fish liver oil, meat.

Functions: It provides twice the energy of carbohydrates.

• They act as reserve food.

• They help absorption of fat-soluble vitamins.

• They insulate the body against heat loss.

• They protect internal organs.

Deficiency: ~~Phrynoderma~~ Phrynoderma.

Excess: Atherosclerosis.

Proteins: They contain carbon, hydrogen, oxygen, and nitrogen. Some proteins also contain sulphur and phosphorus. The basic unit of protein is the amino acid.

Sources: Milk, pulses, peas, beans, eggs, fish, meat, cheese.

Functions: - Proteins are required for growth and repair of the body.
 • They help in formation of enzymes and hormones.
 • They supply energy during emergency.

Deficiency diseases of Proteins:-

• **Kwashiorkor**: It is caused by deficiency of protein. It affects children between 6 months and 3 years. It occurs when breastfeeding stops early and the child is given carbohydrate-rich but protein-poor diet.

Symptoms: -
 • Swelling of legs and face.

• Dark, scaly skin.

• Protruding belly.

Treatment: Protein-rich diet including pulses, milk, eggs, fish, meat, soybean, groundnut, wheat, gram, and jaggery.

• **Marasmus**: It is caused by deficiency of carbohydrates, fats, and proteins. It affects infants below 1 year of age.

Symptoms: -
 • Severe weight loss.

• Loose folded skin.

• Delayed physical and mental growth.

Treatment: Diet rich in proteins and carbohydrates.

Water: Forms about 2-3rd of body weight.

Functions: - Acts as a solvent.

• Helps digestion and transport of nutrients.

• Aids oxygen circulation.

• Helps excretion of wastes.

• Regulates body temperature.

Loss of Water: Through sweat, urine, and water vapour in breath.

Sources: Drinking water, fruits, vegetables.

A person should drink 7-8 glasses of water daily.

Mineral Salts: They are inorganic substances required in small quantities. They help in growth, repair of tissues, enzyme action, and hormone production.

Types:

Macronutrients: Are required in large quantity. Calcium, sodium, potassium, phosphorus, magnesium, sulphur, chlorine.

Micronutrients: Are required in small quantity. Iron, copper, zinc, iodine, fluorine, manganese, cobalt, molybdenum.

Vitamins: Vitamins are organic substances required in small quantities to maintain health. They regulate metabolic activities. Excess is harmful.

Types:

• **Fat-soluble vitamins**:-

A, D, E, K.

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Notes:-

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- Water-soluble vitamins :-

B-complex and V (C)

Not stored; excess is excreted.

Balanced Diet: A balanced diet contains all principal constituents of food in proper quantity. It includes carbohydrates, fats, proteins, mineral salts, vitamins and water.

Calorie requirement varies with age, gender, and nature of work. Labourers require the highest calories.

Malnutrition and Undernutrition:

Malnutrition	Under nutrition
• Condition caused by deficiency or excess of nutrients. • Affects all age groups. • Leads to low or high body weight problems.	• Condition caused by deficiency of nutrients. • Mainly affects infants and children. • Leads mainly to low body weight and poor growth.