

Chapter 9: Nutrition

Introduction:

Nutrition is the process by which organisms obtain and utilize food for growth, repair, and energy. A balanced diet is essential for maintaining good health and preventing nutritional disorders.

1. Classes of Food:

Food can be classified into the following categories based on their functions and nutrients:

a. Carbohydrates:

- **Function:** Provide energy.
- **Sources:** Rice, wheat, potatoes, sugar.
- **Deficiency Effects:** Fatigue, weakness.

b. Fats:

- **Function:** Energy storage, insulation, and protection of organs.
- **Sources:** Butter, oils, ghee, nuts.
- **Deficiency Effects:** Dry skin, fatigue.

c. Proteins:

- **Function:** Growth, repair, and maintenance of body tissues.
- **Sources:** Meat, fish, pulses, eggs.
- **Deficiency Effects:** Stunted growth, muscle wasting.

d. Mineral Salts:

- **Calcium:** Strengthens bones and teeth.
 - *Sources:* Milk, cheese.
 - *Deficiency:* Rickets, osteoporosis.
- **Iron:** Forms hemoglobin for oxygen transport.
 - *Sources:* Spinach, red meat.
 - *Deficiency:* Anemia.
- **Iodine:** Required for thyroid function.
 - *Sources:* Iodized salt, seafood.
 - *Deficiency:* Goiter.

- **Sodium:** Maintains fluid balance.
 - *Sources:* Salt, cheese.
 - *Deficiency:* Muscle cramps.

e. Vitamins:

Vitamin	Function	Source	Deficiency Disease
A	Vision, skin health	Carrots, spinach	Night blindness
B-complex	Metabolism, nerve function	Whole grains, meat	Beriberi, Pellagra, Anemia
C	Immunity, wound healing	Citrus fruits	Scurvy
D	Bone health, calcium absorption	Sunlight, fish	Rickets
E	Antioxidant, protects cell membranes	Nuts, seeds	Neurological issues
K	Blood clotting	Leafy greens	Hemorrhage

f. Water:

- **Function:** Solvent, temperature regulation, waste removal.
- **Sources:** Drinking water, fruits, and vegetables.

g. Cellulose:

- **Function:** Adds bulk to the diet, aids in digestion.
- **Sources:** Whole grains, vegetables.
- **Importance:** Prevents constipation.

2. Balanced Diet:

- **Definition:** A diet that contains all essential nutrients in the right proportions.
 - **Importance:** Maintains body functions, promotes growth, and protects against diseases.
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3. Malnutrition:

Occurs when the diet lacks balanced nutrients, leading to deficiency diseases.

a. Kwashiorkor:

- **Cause:** Protein deficiency.
- **Symptoms:** Swollen abdomen, thin limbs, stunted growth.
- **Prevention:** Protein-rich diet (eggs, fish, pulses).

b. Marasmus:

- **Cause:** General deficiency of proteins and calories.
 - **Symptoms:** Wasting of muscles, severe weight loss, thin limbs.
 - **Prevention:** Calorie and protein-rich diet.
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4. Structure of a Tooth:

- **Main Parts:**
 1. **Crown:** Visible part, covered with enamel.
 2. **Neck:** Junction between crown and root.
 3. **Root:** Anchors tooth to jawbone.
 - **Tooth Layers:**
 - **Enamel:** Hard outer covering.
 - **Dentin:** Beneath enamel, softer.
 - **Pulp:** Soft center with nerves and blood vessels.
 - **Cementum:** Covers root, anchors tooth.
 - **Periodontal Ligament:** Attaches tooth to socket.
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5. Types of Teeth and Their Functions:

Type of Teeth	Number (Adult)	Function
Incisors	8	Cutting and biting
Canines	4	Tearing and piercing
Premolars	8	Grinding and crushing
Molars	12	Grinding and chewing

- **Dental Formula for Adults:**

$$2:1:2:3/2:1:2:3 \times 2 = 32 \text{ teeth}$$

Conclusion:

Nutrition is vital for maintaining health and preventing diseases. A balanced diet provides essential nutrients to the body, while deficiency can lead to health issues like kwashiorkor and marasmus. Understanding the structure and types of teeth helps maintain oral hygiene and proper food processing.