

## Unit 5: Human Health, Nutrition, and Disease

### What is Food?

**Definition of Food:** Food is any substance that is eaten, drunk, or otherwise consumed to sustain life, provide energy, promote growth, and support bodily functions. It can be derived from plants, animals, or fungi and is essential for nutrition. Food contains key nutrients such as carbohydrates, fats, proteins, vitamins, and minerals.

### Importance of Food:

1. **Growth:**
  - Food supplies the substances necessary for building new cells, tissues, and organs. Without adequate food, the body cannot grow or repair itself properly.
2. **Energy:**
  - Biological and chemical reactions in the body require energy, which is obtained from food. Activities such as running, jumping, and moving all need energy that food provides.
3. **Replacement of Damaged Tissues:**
  - Food helps in the repair and replacement of damaged cells and tissues in the body.
4. **Protection from Diseases:**
  - Certain diseases can arise from a lack of specific nutrients. For example, a deficiency in vitamin C can lead to scurvy, while inadequate protein can cause kwashiorkor. Proper nutrition helps prevent these deficiency diseases and supports overall health.

### Nutrition

**Definition of Nutrition:** Nutrition is the process of consuming food and converting it into energy and vital nutrients needed for life. It involves the intake, digestion, absorption, and utilization of food.

### Importance of Nutrition:

- It provides the energy required for various bodily functions.
- It supports growth and repair of body cells.
- It helps maintain overall health and well-being.

## Nutrients

**Definition of Nutrients:** Nutrients are essential chemical substances found in food that support growth, provide energy, and maintain health.

### Types of Nutrients:

#### 1. **Macronutrients:**

- **Carbohydrates:** Provide energy. Sources include potatoes, bread, and rice.
- **Proteins:** Support growth and repair. Sources include meat, eggs, and beans.
- **Fats (Lipids):** Provide energy and support cell function. Sources include butter and oils.

#### 2. **Micronutrients:**

- **Vitamins:** Essential for various biochemical functions. Examples include vitamin A, vitamin C, and vitamin D.
- **Minerals:** Important for body structure and function. Examples include calcium, iron, and iodine.

### Carbohydrates:

- **Types:**
  - **Monosaccharides:** Simple sugars like glucose and fructose.
  - **Disaccharides:** Two simple sugars combined, such as sucrose and lactose.
  - **Polysaccharides:** Complex carbohydrates, like starch and cellulose.

### Fats and Oils:

- **Sources:** Animal fats (solid at room temperature) and plant oils (liquid at room temperature).
- **Functions:** Provide energy, support cell membranes, and assist in absorbing fat-soluble vitamins.

### Proteins:

- **Sources:** Meat, fish, eggs, and legumes.
- **Functions:** Build and repair tissues, make enzymes and hormones.

## Balanced Diet

**Definition of a Balanced Diet:** A balanced diet includes all necessary nutrients in the right proportions to maintain health. It should have:

- **Carbohydrates:** For energy.
- **Proteins:** For growth and repair.
- **Fats:** For energy and absorption of vitamins.
- **Vitamins and Minerals:** For various physiological functions.
- **Water and Fiber:** For digestion and overall health.

## Factors Affecting Nutritional Needs:

- **Age:** Children, adults, and elderly people have different nutritional requirements.
- **Sex:** Women and men may have different needs.
- **Activity Level:** Physically active people need more energy.
- **Lifestyle and Health Conditions:** Special conditions, like pregnancy, may require specific diets.

## Deficiency Diseases

**Definition:** Deficiency diseases occur when the body lacks essential nutrients, leading to health problems.

### Examples:

- **Marasmus:** Caused by a lack of carbohydrates, leading to extreme thinness and weakness.
- **Kwashiorkor:** Caused by inadequate protein intake, leading to swelling and skin changes.
- **Anemia:** Resulting from iron deficiency, causing fatigue and weakness.
- **Rickets:** Caused by vitamin D deficiency, leading to weak and deformed bones.
- **Scurvy:** Caused by vitamin C deficiency, leading to bleeding gums and poor wound healing.

### Summary Table:

Nutrient	Good Food Sources	Use in the Body	Deficiency Disease
Protein	Meat, eggs, beans	Growth, repair	Kwashiorkor
Carbohydrates	Bread, rice, potatoes	Energy	Marasmus
Vitamin C	Citrus fruits	Tissue repair	Scurvy

Nutrient	Good Food Sources	Use in the Body	Deficiency Disease
Vitamin D	Milk, fish	Bone health	Rickets
Iron	Red meat, beans	Oxygen transport	Anemia
Calcium	Milk, green vegetables	Bone strength	Rickets

This note provides a comprehensive understanding of food, nutrition, nutrients, and their importance for maintaining health.

## Malnutrition

**Definition:** Malnutrition occurs when a person does not consume enough nutrients or has an imbalance in their nutrient intake. This can lead to a range of health problems.

### Causes:

- **Poverty:** Lack of financial resources to buy adequate food.
- **Famine:** Due to drought or floods affecting food availability.
- **Soil Erosion:** Reduces agricultural productivity.
- **Wars:** Disrupts food production and distribution.
- **Overpopulation:** Too many people for available land.
- **Lack of Knowledge:** Ignorance about proper nutritional needs.

### Types of Malnutrition:

1. **Under Nutrition:** This occurs when the body does not get enough protein and energy (carbohydrates and fats). It leads to:
  - **Wasting:** Low weight-for-height. Indicates recent severe weight loss and often happens due to inadequate food intake or frequent illnesses.
  - **Stunting:** Low height-for-age. Results from chronic undernutrition, typically linked to poverty, poor maternal health, and inadequate feeding.
  - **Underweight:** Low weight-for-age.
2. **Micronutrient Deficiencies:** Lack of essential vitamins and minerals needed for growth and development.
3. **Overweight and Obesity:** Occurs when the intake of high-energy foods exceeds the body's energy needs. This can lead to:
  - **Heart Disease:** Due to high-fat diets leading to arterial blockages.
  - **Diabetes:** High sugar intake contributes to type 2 diabetes.
  - **Joint Issues:** Excess weight puts pressure on joints.

## Prevention:

- **Diverse Diet:** Eat a variety of nutrient-rich foods.
- **Avoid Junk Food:** Minimize consumption of high-sugar and high-fat foods.
- **Exercise Regularly:** Helps balance energy intake and expenditure.

## Substance Abuse

### Drugs:

- **Medicinal Drugs:** Used legally to treat illnesses (e.g., pain relievers).
- **Recreational Drugs:** Used for pleasure or to alter mood (e.g., caffeine, alcohol).

**Substance Abuse:** Using substances excessively or inappropriately can lead to serious health issues. Common substances include:

- **Caffeine:** Found in coffee and energy drinks. Excessive consumption can lead to addiction.
- **Tobacco:** Contains nicotine, tar, and carbon monoxide, leading to:
  - **Chronic Bronchitis:** Irritation of the lungs causing persistent cough and mucus.
  - **Emphysema:** Damage to lung alveoli reducing oxygen absorption.
  - **Cancer:** Tar contains carcinogens that can lead to lung cancer.
- **Alcohol:** A depressant that affects the brain and body, causing:
  - **Coordination Loss:** Difficulty in movement and judgment.
  - **Addiction:** Dependence on alcohol for relaxation or coping.
  - **Health Issues:** Long-term use can lead to liver damage, heart disease, and brain damage.

### Chewing Khat:

- **Effects:** Provides stimulation but can lead to irritability, appetite loss, and digestive issues.
- **Social Problems:** May contribute to family and social issues.

### Recovery from Substance Abuse:

- **Admit the Problem:** Acknowledge the addiction.
- **Seek Support:** Get help from friends, family, or professionals.
- **Change Routine:** Develop healthier habits.
- **Celebrate Progress:** Recognize and enjoy small successes.
- **Avoid Relapse:** Identify and avoid triggers.

These notes cover the essentials of malnutrition and substance abuse, offering a clear understanding of their causes, effects, and prevention or management strategies.

## Infectious and Non-Infectious Diseases

### *What is a Disease?*

A disease is a condition where the body does not function normally, leading to symptoms such as headaches, increased body temperature, pain, distress, or weakness. Diseases can be classified into two main types: infectious and non-infectious.

### *1. Infectious Diseases*

Infectious diseases are caused by microorganisms known as pathogens. These diseases can spread from one person to another. The pathogens include:

- **Bacteria** (e.g., Tuberculosis)
- **Viruses** (e.g., HIV/AIDS, COVID-19)
- **Protozoa** (e.g., Malaria)
- **Fungi** (e.g., Ringworm)

### **Characteristics of Infectious Diseases:**

- **Host Specificity:** Some pathogens infect humans, while others may infect animals or plants.
- **Mode of Transmission:** Infectious diseases can be spread through various means such as direct contact, contaminated food or water, insect bites, or sexual contact.
- **Severity:** The impact can range from mild (e.g., common cold) to severe (e.g., HIV/AIDS).

### **Transmission Modes:**

1. **Direct Contact:** Through physical interaction with an infected person.
2. **Contaminated Food/Water:** Pathogens can survive in unclean food or water.
3. **Insect Bites:** Insects like mosquitoes can carry and transmit diseases.
4. **Sexual Intercourse:** Certain diseases are spread through bodily fluids.

### **Prevention and Control:**

- **Vaccination:** Helps the body defend against specific pathogens.
- **Personal Hygiene:** Regular hand washing and food handling practices prevent infection.

- **Hygienic Food Preparation:** Proper cooking and handling of food.
- **Boiling Water:** Ensures water is free from pathogens.
- **Proper Waste Disposal:** Keeps environment clean and reduces contamination.
- **Sewage Treatment:** Prevents disease spread through contaminated water.

### Examples:

- **HIV/AIDS:** Caused by the human immunodeficiency virus (HIV), affecting the immune system.
- **Tuberculosis (TB):** Caused by Mycobacterium tuberculosis, primarily affecting the lungs.
- **Malaria:** Caused by Plasmodium protozoa, transmitted by Anopheles mosquitoes.
- **COVID-19:** Caused by SARS-CoV-2 virus, primarily affecting the respiratory system.

## 2. Non-Infectious Diseases

Non-infectious diseases are not caused by pathogens. They arise from genetic factors, lifestyle choices, or environmental factors. Examples include:

- **Malnutrition-Related Diseases:** Kwashiorkor, Scurvy, Night Blindness.
- **Lifestyle Diseases:** Lung cancer, Chronic bronchitis (due to cigarette smoke).
- **Genetic Disorders:** Sickle cell anemia, Diabetes.

### Characteristics:

- **Causes:** May include poor diet, genetic predispositions, or exposure to harmful substances.
- **Detection and Treatment:** Focus on managing symptoms, improving lifestyle, and preventive measures.

### Prevention:

- **Healthy Diet:** Ensures balanced nutrition and prevents deficiency diseases.
- **Avoiding Harmful Substances:** Reduces risk of diseases linked to tobacco and alcohol.
- **Regular Exercise:** Helps manage conditions like obesity and cardiovascular diseases.

### Summary

Understanding the differences between infectious and non-infectious diseases helps in better prevention and treatment. Infectious diseases require measures to control pathogens and prevent their spread, while non-infectious diseases often require lifestyle changes and management of risk factors.

