



"Let food be thy medicine and medicine be thy food."

– Hippocrates

Mindful Eating: A Path to a Healthy Body

The Big Question

Imagine a world where every meal feels rushed, where you eat without truly tasting, and where your body often feels tired or unwell after eating. What if there was a simple way to transform your relationship with food, leading to more energy, better digestion, and a healthier you? This chapter will unveil the transformative power of mindful eating, a practice that reconnects you with your body's wisdom and joy of food.

Meet EeeBee.AI



Hello, healthy eaters-in-training! I'm EeeBee, your AI buddy. Let's explore mindful eating—what it means, how to practice it, and how paying attention to your food can improve your body and mind!

Still curious? Talk to me by scanning the QR code.

Learning Outcomes

By the end of this chapter, students will be able to:

- Recognize the importance of food as fuel for our bodies and its cultural variations across regions.
- Understand the components of food and their roles in maintaining health.
- Identify diseases caused by nutritional gaps and ways to prevent them.
- Design balanced diets while considering factors such as nutrition and sustainability.
- Develop the ability to make conscious food choices that promote physical well-being and self-awareness.

From Last Year's Notebook

- Food and Its Components
- Lifestyle and Deficiency Diseases
- Food, Nutrients, and Energy

Science Around You

Food is more than just fuel; it's intricately linked to our physical and mental well-being. From boosting our energy levels and supporting growth to impacting our mood and preventing diseases, what and how we eat profoundly affects our lives. Understanding mindful eating helps us make healthier choices, reduce stress related to food, and build a more positive and balanced relationship with our meals and bodies.

NCF Curricular Goals and Competencies

This chapter aligns with the following curricular goals and competencies:

CG-5 (C 5.1, 5.2, and 5.3) applies the principles of nutrition, sustainability, and health to daily life, fostering responsible and mindful eating habits.



Mind Map

Mindful Eating: A Path to a Healthy Body

Fueling Our Bodies

- ❖ Food is the material or substance that we consume to sustain life
- ❖ It is to Protect the body from Diseases and.....
- ❖ It is used to Repair Injured Body Parts

State	Famous Food
Punjab	Makki di Roti & Sarson da Saag
Gujarat	Dhokla
Maharashtra	Vada Pav
West Bengal	Rosogolla
Tamil Nadu	Dosa & Sambar
Rajasthan	Dal Baati Churma
Kerala	Appam & Stew
Bihar	Litti Chokha

Components of Food

Essential for: Energy, Growth, Repair, Repair, Well-being Well

Seven Nutrients:

- ✓ **Carbohydrates** → Main source of energy
- ✓ **Proteins** → Essential for growth and repair
- ✓ **Fats** → Provides energy and supports cell function
- ✓ **Vitamins** → Necessary for various body functions
- ✓ **Minerals** → Helps in bone strength, nerve function, etc.
- ✓ **Water** → Vital for hydration and bodily processes
- ✓ **Fiber** → Aids in digestion and gut health

Diseases Caused by Nutritional Gaps

❖ Types of Deficiencies & Diseases:

- ✓ **Carbohydrate Deficiency** → Fatigue, Weakness
- ✓ **Protein Deficiency** → Kwashiorkor, Marasmus
- ✓ **Fat Deficiency** → Hormonal Imbalance, Skin Issues
- ❖ **Vitamin Deficiencies:**
 - ✓ **Vitamin A** → Night Blindness
 - ✓ **Vitamin B** → Beriberi, Pellagra
 - ✓ **Vitamin C** → Scurvy
 - ✓ **Vitamin D** → Rickets, Osteomalacia

❖ Mineral Deficiencies:

- ✓ **Iron** → Anemia
- ✓ **Calcium** → Osteoporosis
- ✓ **Iodine** → Goiter

Balanced Diet

A diet that provides all essential nutrients in appropriate proportions for health and well-being.

Food Miles: From farm to Our Plate



Can you explain how mindful eating can help me feel better and healthier?

Yes, by paying attention to hunger cues, flavors, and how food makes you feel, mindful eating helps you make better choices, prevent overeating, and enjoy your food more, leading to a healthier body and mind.

In Focus

- Fueling Our Bodies
- Components of Food
- Diseases Caused by Nutritional Gaps
- Balanced Diet

Introduction

Mindful eating is an approach to food consumption that emphasizes awareness, balance, and intention. It involves paying attention to what we eat, how we eat, and why we eat, focusing on the nutritional and emotional connection with food. By understanding the importance of each meal, mindful eating encourages us to choose foods that fuel our bodies, promote well-being, and prevent diseases. This practice goes beyond simply satisfying hunger—it integrates cultural traditions, personal health goals, and sustainability into our food choices. Through mindful eating, we can cultivate a healthier relationship with food and make informed decisions about what we consume.

From History's Pages

The concept of mindful eating is deeply rooted in ancient traditions and practices across the world. Mindful eating was formally introduced as part of Buddhist meditation practices, particularly in Zen Buddhism. In Buddhism, mindful eating is part of meditation practices, encouraging individuals to eat slowly, savor each bite, and cultivate gratitude for the food they consume. In the late 20th century, mindful eating began to gain recognition in Western cultures, largely due to the work of professionals like Dr. Jon Kabat-Zinn. In 1979, Dr. Kabat-Zinn founded the Mindfulness-Based Stress Reduction (MBSR) program at the University of Massachusetts Medical School.

In the 20th century, governments and health organizations began creating dietary guidelines to educate people about balanced diets. The USDA introduced the first food guide in 1943, which later evolved into the Food Pyramid in 1992 and MyPlate in 2011.

Fueling Our Bodies

Food and Its Importance

Food is the material or substance that we consume to sustain life. It is an essential source of energy for the body and plays a vital role in the growth, development, and overall well-being of an organism. Food is not merely a source of satisfaction but also a fundamental requirement for the survival of all living beings. Organisms rely on food for various critical functions that are essential for life.

Why Do Organisms Need Food?

- To Provide Energy for Various Activities: Food serves as the primary source of energy that powers all activities in the body, whether it's simple movements like walking and running or complex internal functions like breathing and digestion.

- **For Growth and Development of the Body:** Food contains essential nutrients like proteins, carbohydrates, fats, vitamins, and minerals that contribute to the physical and mental growth of an organism.
- **To Protect the Body from Diseases and Keep It Healthy:** Certain foods, especially those rich in vitamins and minerals, boost the immune system, helping the body fight off infections and diseases.
- **To Repair Injured Body Parts:** When the body suffers an injury, nutrients like proteins play a key role in repairing damaged tissues and cells.

1. Food in Different Regions

The traditional cuisine of a region often reflects the crops cultivated locally, which depend on the soil type and climate. India, being an agricultural country, has diverse soil types and climatic conditions, leading to the cultivation of different crops across regions. These crops influence food habits, traditional recipes, and beverages, shaped by cultural, regional, and taste preferences. The table below highlights some examples of locally grown crops, traditional dishes, and beverages from different states in India.

State	Locally Cultivated Crops	Traditional Dishes	Popular Beverages
Gujarat	Pearl millet (bajra), jowar, wheat, rice	Handvo, thepla, dhokla, fafda, undhiyu	Buttermilk, sugarcane juice.
Karnataka	Rice, ragi, urad dal, coconut	Idli, dosa, sambhar, coconut chutney, ragi mudde, palya	Filter coffee, buttermilk.
Manipur	Rice, bamboo shoots, soya bean	Eromba (spicy chutney), utti (pea and onion curry), singju, kangshoi	Black Tea
Punjab	Maize, wheat, chickpeas, pulses	Makki di roti, sarson da saag, chhole bhature, paratha, halwa, kheer	Lassi, milk, tea
Rajasthan	Bajra, jowar, gram, maize	Dal baati churma, gatte ki sabzi, ker sangri	Buttermilk (chaas)
West Bengal	Rice, fish, mustard seeds	Fish curry, rice, luchi-aloo dum, rasgulla, sandesh	Tea (chai)

2. Change in Cooking Practices Over Time

Culinary practices have undergone significant transformation over time due to cultural, historical, and economic factors. These changes reflect evolving tastes, lifestyles, advancements in technology, improved transportation, and the influence of global food trends.

Keywords

Breathing: The plant stem facilitates gas exchange by allowing oxygen and carbon dioxide to move through its tiny pores (lenticels).

Digestion: The plant stem helps in the breakdown of stored starch into sugars for energy transport to various parts.

Aspect	Traditional Practices	Modern Practices
Cooking Methods	Cooking was primarily done using chulhas (clay stoves) fueled by wood or coal.	Cooking is now mostly done using gas stoves or electric induction cooktops.
Grinding and Blending	Manual grinding using a sil-batta (stone grinder) was common.	Electrical grinders and mixers are used for faster and easier grinding.
Food Preparation	Most processes were labor-intensive and required significant manual effort.	Modern appliances like food processors reduce manual work and save time.
Influence of Global Trends	Recipes were influenced by local traditions and available ingredients.	Exposure to global cuisines has introduced new flavors, techniques, and fusion recipes.
Storage and Preservation	Food storage relied on natural methods like sun drying or clay pots.	Refrigerators and freezers are now commonly used for storing perishable items .

These changes highlight how technological innovations and global connectivity have streamlined cooking while introducing a wide array of culinary options.

Fact Flash



Did you know That an average adult human body contains enough carbon to make 9,000 pencils? Also, a single apple can contain about 10-15 grams of carbohydrates, providing quick energy to our bodies!

Common Misconceptions



- × **Misconception:** All fats are bad for you.
- ✓ **Correction:** There are "good" fats (unsaturated) essential for health, found in foods like avocados and nuts.
- × **Misconception:** Skipping breakfast helps you lose weight.
- ✓ **Correction:** Breakfast provides essential energy for the day and can help regulate **metabolism**.

Science Around You



Science is all around us, even in the food we eat and the water we drink. It explains how these essential components exist and function to sustain life. From the intricate journey of food from farm to table to the vital role water plays in our bodily functions, science provides the understanding. For instance, rice, a staple in many cultures, is cultivated in paddy fields, a process guided by scientific principles of agriculture. Similarly, the water cycle, involving evaporation, condensation, and precipitation, ensures a continuous supply of this critical resource. Scientific advancements in nutrition and food processing have revolutionized how we produce and prepare food, improving public health and food security worldwide.

Keywords

Perishable Items: The goods that spoil or decay quickly, such as fruits, vegetables, and dairy products. They require proper storage like refrigeration to maintain freshness and prevent spoilage.

Metabolism: It is the set of life-sustaining chemical reactions in the body that convert food into energy. It includes processes like digestion, energy production, and waste elimination.

Activity

The Sugar in Your Drink: A Sweet Test

Objective: To estimate the sugar content in different common beverages.

- **Materials:** Several clear glasses or cups, various sugary drinks (e.g., fruit juice, soda, sports drink), a measuring spoon (teaspoon), sugar.
- **Procedure:**
 - **Setup:** Pour a measured amount (e.g., 100ml) of each drink into separate glasses.
 - **Research:** Find out the approximate sugar content per 100ml for each drink (usually available on nutrition labels or online).
 - **Estimation:** For each drink, measure out the equivalent amount of dry sugar into a separate, empty glass using the teaspoon (1 teaspoon = approximately 4 grams of sugar).
 - **Comparison:** Visually compare the pile of sugar to the drink in the other glass.
 - Record your observations in a table.
- **Observation:** Note which drinks contain the most sugar and how surprising the amount of sugar in seemingly "healthy" drinks can be.

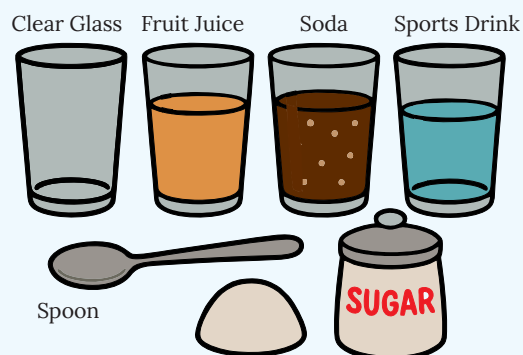


Fig. 3.1 Materials Required

Knowledge Checkpoint



Gap Analyzer™
Homework

Watch Remedial



Multiple Choice Questions:

- What is the primary role of carbohydrates in the body?

(a) Building muscles	<input type="checkbox"/>	(b) Providing energy	<input type="checkbox"/>
(c) Repairing tissues	<input type="checkbox"/>	(d) Regulating temperature	<input type="checkbox"/>
- Which process is essential for transporting nutrients throughout the body?

(a) Digestion	<input type="checkbox"/>	(b) Respiration	<input type="checkbox"/>	(c) Circulation	<input type="checkbox"/>	(d) Excretion	<input type="checkbox"/>
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- Which of the following is NOT a primary component of a balanced diet?

(a) Proteins	<input type="checkbox"/>	(b) Vitamins	<input type="checkbox"/>
(c) Processed sugars	<input type="checkbox"/>	(d) Minerals	<input type="checkbox"/>

Short Answer Question:

- Explain how food acts as fuel for the body and apply this by giving two examples of body activities that require energy.
- Explain the role of energy-giving foods and apply this by naming two food sources that supply energy.

Long Answer Question:

- Explain why food and water are considered essential components of life. Describe three different ways food fuels our bodies and discuss the importance of understanding the materials (ingredients) that make up our meals for both health and environmental sustainability.

Components of Food

Food is made up of different essential components called nutrients, which are required for the body to function properly and maintain energy levels. Nutrients can be grouped into three categories based on their role in maintaining health. These components include carbohydrates, proteins, fats, vitamins, minerals, water, and dietary fiber. Carbohydrates and fats provide energy, while proteins help in body building and repair. Vitamins and minerals protect the body against diseases and support various biochemical functions.

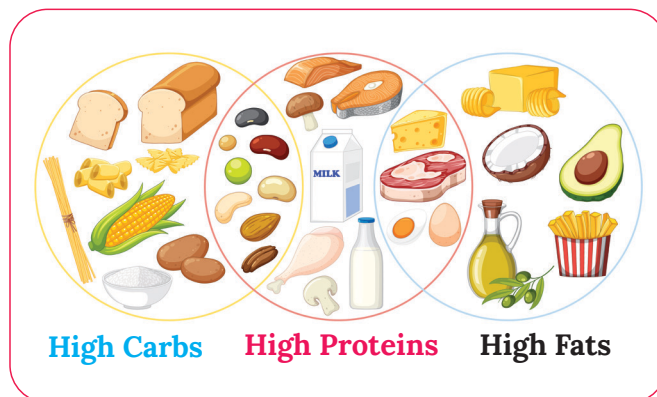


Fig. 3.2 Components of Food

Nutrient Group	Examples of Foods	Primary Function
Energy-giving Foods	Carbohydrates and Fats: Honey, jaggery, sweet potato, bread, cereals (like rice and wheat), oils	Provide energy for daily activities.
Bodybuilding Foods	Proteins: Milk, lentils, beans, cheese, eggs, fish, chicken	Help in growth, repair, and strength of body tissues.
Protective Foods	Vitamins and Minerals: Spinach, cabbage, carrots, tomatoes, fruits, milk	Boost immunity and protect the body from diseases.

Seven Components of Food

Our body requires essential nutrients for energy, growth, repair, and overall well-being. These nutrients are broadly categorized into seven types: carbohydrates, proteins, fats, vitamins, minerals, water, and fiber. Each plays a crucial role in maintaining health and fulfilling specific bodily functions.

Nutrient Categories and Their Roles

Nutrient	Description	Food Sources
Carbohydrates	Primary energy providers for the body. Simple carbs (like sugar) give quick energy, while complex carbs (like whole grains) sustain energy for longer periods.	Potatoes, honey, wheat (chapati), brown rice, fruits like mango, and papaya.
Fats	Concentrated energy sources that provide insulation and protect organs. Fats are vital for absorbing certain vitamins.	Dairy products like butter and cheese, nuts like almonds and cashews, vegetable oils, and seeds.
Proteins	Body building nutrients needed for growth, repair of tissues, and boosting immunity. Found in both plant and animal-based foods.	Pulses (lentils, peas, soybeans), eggs, dairy, fish, and meat.
Vitamins	Essential for regulating body functions and strengthening immunity. Different vitamins perform unique roles, such as Vitamin C for immunity and Vitamin D for bones.	Citrus fruits, spinach, carrots, dairy products, and nuts.
Minerals	Required in small amounts but critical for health. Minerals like calcium support bone health, while iron aids in oxygen transport.	Leafy greens, dairy, fish, eggs, and nuts.

Water	Vital for survival, aiding in digestion, detoxification, and maintaining hydration. It regulates body temperature and supports metabolic functions.	Drinking water, fruits like watermelon, and soups or broths.
Fiber	Important for digestive health and maintaining cholesterol levels. Fiber adds bulk to the diet and aids bowel movement .	Whole grains (oats, rice), carrots, apples, and beans.

Millets: Nutrition-rich Cereal

Millets are a group of small-grained cereal crops that have been a staple food in India for centuries. Known for their versatility and resilience, these crops are native to India and thrive in a variety of climatic conditions, making them an essential part of sustainable agriculture.

Examples of Millets



Jowar (Sorghum)



Bajra (Pearl Millet)



Ragi (Finger Millet)



Sanwa (Barnyard Millet)

Health Benefits of Millets

- Balanced Diet:** Millets provide essential nutrients for growth and development, making them ideal for children and adults.
- Disease Prevention:** Their high fiber content and nutrient richness help:
 - Manage diabetes.
 - Reduce the risk of heart disease.
 - Improve overall immunity.
- Weight Management:** Millets keep you fuller for longer, supporting healthy weight management.
- Easy Digestion:** Being gluten-free, they are suitable for those with gluten intolerance and are easy on the stomach.

Fact Flash



Did you know that broccoli contains more vitamin C than an orange? Also, the human body is made up of about 60% water, and it's involved in almost every bodily function!

Keywords

Cholesterol: It is a fat-like substance found in the blood, needed for building cells and making hormones.

Bowel Movement: It is the process of eliminating solid waste (stool) from the digestive system.

Common Misconceptions

- ✗ **Misconception:** All fats are bad for you.
- ✓ **Correction:** Some fats, like monounsaturated and polyunsaturated fats (found in avocados and nuts), are essential for good health.
- ✗ **Misconception:** Skipping meals helps you lose weight.
- ✓ **Correction:** Skipping meals can slow down metabolism and lead to overeating later, which is often counterproductive for weight loss.

Science Around You



Science is all around us, even in the food we eat! From the smallest nutrient to the complexity of a balanced meal, science explains how food provides energy and sustains life. For instance, digestion is a complex chemical process where food is broken down into smaller molecules for absorption. Carbohydrates, like those in bread, are converted to glucose, providing quick energy. Proteins, found in meat and beans, are essential for building and repairing tissues. Scientific understanding of nutrition has revolutionized diets, leading to healthier lives and preventing many diseases.

Activity

Testing for Starch: The Iodine Test

Objective: To identify the presence of starch in different food samples.

- **Materials:** Various food samples (e.g., potato slice, bread piece, apple slice, cooked rice, sugar), iodine solution (diluted with water, for safety), dropper, small plates or watch glasses.
- **Procedure:**
 - **Setup:** Place a small piece of each food sample on a separate plate.
 - **Test the Tester:** Add a drop of iodine solution to a known starch-containing food like a potato. It should turn blue-black.
 - **Testing Materials:** Add one or two drops of iodine solution to each food sample.
 - Record your observations in a table.
- **Observation:** Note which food samples turned blue-black, indicating the presence of starch, and which did not change color significantly.

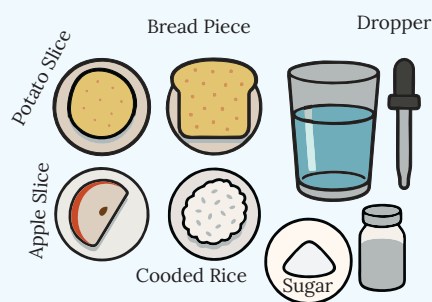


Fig. 3.3 Materials Required

Knowledge Checkpoint



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Homework

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Multiple Choice Questions:

1. Which nutrient is the primary source of quick energy for the body?

(a) Protein

☐

(b) Vitamins

☐

(c) Carbohydrates

☐

(d) Fats

☐

2. Which process breaks down food into smaller molecules for absorption?
 (a) Respiration ☐ (b) Photosynthesis ☐ (c) Digestion ☐ (d) Circulation ☐
3. Which of the following is NOT a macronutrient?
 (a) Protein ☐ (b) Water ☐ (c) Minerals ☐ (d) Fats ☐

Short Answer Question:

4. Show two examples of protective foods and two examples of body-building foods and explain how they are applied for body health.
5. Explain the role of vitamins and minerals and apply this by giving two examples of food items that contain them.

Long Answer Question:

6. Explain why a balanced diet is crucial for maintaining good health. Describe three different types of nutrients (e.g., vitamins, minerals, proteins) and their importance, and discuss how scientific understanding of food components helps in making healthier dietary choices.

Diseases Caused by Nutritional Gaps

Nutrition is the cornerstone of a healthy life, as our body depends on essential nutrients to function effectively. However, when the diet lacks key vitamins, minerals, or macronutrients, it can lead to nutritional gaps, causing various health problems. Diseases like scurvy (caused by vitamin C deficiency), rickets (due to a lack of vitamin D), anemia (resulting from insufficient iron or vitamin B12), and osteoporosis (linked to inadequate calcium and vitamin D) are direct outcomes of these deficiencies. Similarly, protein-energy malnutrition can lead to conditions like kwashiorkor and stunted growth, especially in children.

Deficiency of Carbohydrates

Fatigue: The body lacks sufficient energy, resulting in a constant feeling of tiredness.

Loss of Stamina: A decrease in physical endurance and strength, making it harder to perform prolonged tasks or activities.

Quick Exhaustion: The body becomes unable to sustain energy for extended periods, leading to tiredness even after minimal exertion.

Importance of Carbohydrates:

- Vital for overall energy metabolism and functioning of the body.
- A deficiency disrupts the body's ability to maintain normal activity levels.

Deficiency of Proteins

Stunted Growth: Insufficient protein intake can impair physical and mental development, particularly in children.

Hair Discoloration: Lack of protein affects melanin production, leading to changes in hair color or texture.

Face Swelling: Protein deficiency can result in fluid retention, causing puffiness in the face and other body parts.

Skin Issues: Dry, flaky, or peeling skin can occur due to inadequate protein levels.

Diarrhea: Poor protein intake can weaken the intestinal lining, leading to digestive issues like diarrhea.

Swollen Abdomen: A prominent symptom of protein deficiency caused by fluid imbalance (edema).

Severe Protein Deficiency in Children:

Kwashiorkor:

- Occurs due to extreme protein deficiency despite sufficient calorie intake.

Symptoms include:

- Swollen abdomen.
- Hair discoloration.
- Irritability and lethargy.
- Skin lesions and infections.

Marasmus:

- Caused by a severe deficiency of both protein and calories.

Symptoms include:

- Extreme weight loss and muscle wasting.
- Thin and fragile appearance.
- Lack of energy and severe weakness.

Deficiency of Vitamins and Minerals

Vitamins are classified into two categories: fat-soluble (e.g., A, D, E, K) and water-soluble (e.g., B-complex, C). A balanced diet rich in fruits, vegetables, and other nutrient-dense foods is necessary to meet the body's vitamin requirements.

Vitamin	Description	Deficiency Disease	Symptoms	Sources
Vitamin A	Keeps eyes and skin healthy	Night blindness	Loss of night vision, poor vision, complete vision loss	Carrots, tomatoes, green leafy vegetables, mango, milk, butter, fish liver oil
Vitamin B ₁	Supports heart and body functions	Beriberi	Fatigue, trouble breathing, swelling/tingling in extremities	Cereals, peas, nuts, whole grains, potatoes, yeast, meat, milk
Vitamin B ₁₂	Forms red blood cells	Anemia	Deficiency of red blood cells, pale skin, lack of appetite	Meat, liver, yeast, fish, milk
Vitamin C	Maintains teeth, gums, bones; fights diseases	Scurvy	Swelling/bleeding of gums, slow wound healing	Citrus fruits, tomatoes, guava, green chilies
Vitamin D	Forms strong bones and teeth by absorbing calcium	Rickets	Weak, soft, bent bones, tooth decay	Sunlight, milk, fish, butter, eggs
Vitamin K	Aids in blood clotting	Impaired blood clotting	Bleeding of gums	Spinach, cabbage, eggs, liver

Minerals are essential nutrients required by the body in small amounts for various vital functions. They play a crucial role in maintaining healthy bones, teeth, muscles, and nerves, as well as supporting enzyme activities and hormone production.

Mineral	Functions	Deficiency Disease	Symptoms	Sources
Calcium	Formation of bones and teeth; blood clotting	Bone and tooth decay; Rickets	Weak bones, tooth decay	Milk, cheese, curd, soya milk, green vegetables
Iodine	Physical and mental well-being functions	Goitre	Swelling in the neck, mental retardation	Seafood, chestnut, iodized salt
Iron	Formation of red blood cells	Anemia	Pale skin, whitish nails, body weakness	Cereals, leafy vegetables, meat, beetroot, eggs
Fluorine	Strengthens teeth	Tooth decay	Increased tooth decay	Seafood, oatmeal, coffee, tea

Fact Flash



Did you know that your body needs 13 different vitamins to function properly? Also, the human body can't produce Vitamin C on its own, which is why it's essential to get it from your diet!

Common Misconceptions



- × **Misconception:** All fats are bad for you.
- ✓ **Correction:** Some fats, like unsaturated fats found in avocados and nuts, are essential for health.
- × **Misconception:** Eating organic food prevents all diseases.
- ✓ **Correction:** While organic food can be healthier, a balanced diet and overall lifestyle are key to disease prevention.

Science Around You



Science helps us understand the intricate relationship between nutrition and health, including how nutritional gaps can lead to various diseases. It explains how different vitamins, minerals, and macronutrients are absorbed and utilized by our bodies to maintain vital functions. For instance, without adequate Vitamin D, our bodies struggle to absorb calcium, impacting bone health. Similarly, a lack of iron can lead to anemia, affecting oxygen transport in the blood. Today, scientific research continues to advance our understanding of dietary needs, leading to fortifying foods and supplements that improve public health and prevent deficiency diseases.

Activity

Identifying Nutrient-Rich Foods: The Food Label Detective

Objective: To analyze food labels to identify and compare their nutritional content.

- **Materials:**
 - Various packaged food items with nutrition labels (e.g., cereal box, yogurt cup, snack bar, canned soup), pen/pencil, paper for recording.
- **Procedure:**
 - **Setup:** Collect 3-5 different packaged food items.
 - **Reading Labels:** For each item, locate the "Nutrition Facts" panel on the packaging.
 - **Identifying Key Nutrients:** Focus on key nutrients like Vitamin C, Vitamin D, Iron, Calcium, Fiber, and Protein.
 - **Comparison:** Compare the amounts of these nutrients across the different food items.
 - Record your observations in a table.
- **Observation:** Note which food items are good sources of particular nutrients and which have lower amounts, identifying potential nutritional gaps if those are primary food sources.

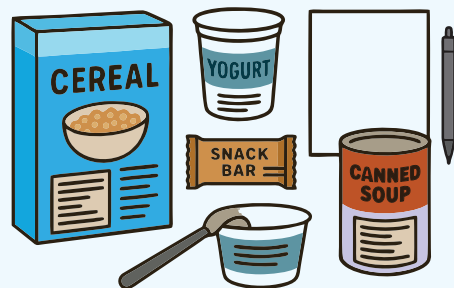






Fig. 3.4 Materials Required









Knowledge Checkpoint

Gap Analyzer™
Homework

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Remembering

Multiple Choice Questions:

- Which nutrient is essential for strong bones and teeth?
 (a) Iron ☐ (b) Vitamin C ☐ (c) Calcium ☐ (d) Potassium ☐

Understanding

- A prolonged lack of Vitamin C in the diet can lead to which disease?
 (a) Rickets ☐ (b) Anemia ☐ (c) Scurvy ☐ (d) Goiter ☐
- Which of the following is NOT a macronutrient?
 (a) Carbohydrates ☐ (b) Proteins ☐ (c) Vitamins ☐ (d) Fats ☐

Short Answer Question:

- Explain what deficiency diseases are and apply this by giving two examples with their causes.
- Show how lack of nutrients affects health and apply this by naming two common diseases caused by nutritional gaps.

Applying

Long Answer Question:

- Explain why understanding the role of different nutrients is crucial for preventing diseases. Describe three common deficiency diseases and discuss the importance of both diverse food intake and public health initiatives in addressing nutritional gaps in communities.

Analyzing

Long Answer Question:

- Explain why understanding the role of different nutrients is crucial for preventing diseases. Describe three common deficiency diseases and discuss the importance of both diverse food intake and public health initiatives in addressing nutritional gaps in communities.

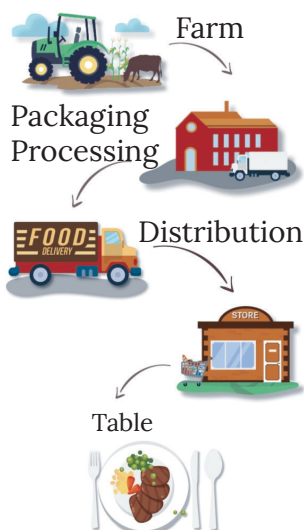
Balanced Diet

A balanced diet includes a variety of foods in the right proportions to provide all the essential nutrients the body needs for proper functioning. It typically consists of carbohydrates, proteins, fats, vitamins, minerals, fiber, and adequate water. A balanced diet ensures energy, growth, immunity, and overall well-being while preventing nutrient deficiencies and health problems.

Food Miles: From Farm to Our Plate

Definition of Food Miles:

- The total distance food travels from producer to consumer.



Environmental Impact:

- Long-distance transportation increases costs and pollution.
- Crops often transported internationally via air or sea.

Importance of Reducing Food Miles:

- Supports local farmers.
- Promotes consumption of fresh and healthy food.
- Reduces environmental harm caused by transportation.

Food Waste:

- Many people waste food by leaving it uneaten.
- Food waste disregards the efforts of farmers and others in the food supply.

Fact Flash

Did you know that an average adult human body is made up of about 55-60% water? Also, the sweet potato is one of the most nutritious vegetables, packed with vitamins and minerals, and has been a staple food for thousands of years!

Fig. 3.5 Farm to Our Plate

Common Misconceptions

- × **Misconception:** All fats are bad for you.
- ✓ **Correction:** While some fats are unhealthy, others (like those found in avocados and nuts) are essential for good health.
- × **Misconception:** Skipping meals helps you lose weight faster.
- ✓ **Correction:** Skipping meals can slow down metabolism and lead to overeating later, hindering weight loss efforts.

Science Around You



Science permeates every aspect of our daily lives, often without us realizing it. From the way our bodies convert food into energy to the **intricate processes** that sustain life, science provides explanations for these fundamental occurrences. For instance, digestion, a complex **biochemical process**, breaks down food into nutrients our bodies can absorb and use for growth and repair. It involves various enzymes and acids working in harmony to fuel our cells. Our bodies constantly adapt to different food intakes, showcasing the remarkable efficiency of biological systems. Today, nutritional science continues to revolutionize our understanding of healthy eating, transforming how we approach diet and well-being.

Activity

Testing for Starch: The Iodine Test

Objective: To identify the presence of starch in different food items.

Materials: Iodine solution (diluted), eyedropper, small plates or watch glasses, various food samples to test (e.g., potato slice, bread, apple slice, rice, sugar, flour).

- **Procedure:**
 - **Setup:** Place small pieces of each food sample on separate plates.
 - **Test the Tester:** Put a drop of iodine solution on a known starch (like potato). It should turn bluish-black.
 - **Testing Materials:** Add 1-2 drops of iodine solution onto each food sample.
 - Record your observations in a table.
- **Observation:** Note which food items turned bluish-black (indicating starch presence) and which did not.



Fig. 3.6 Materials Required

Keywords

Intricate Processes: Intricate processes in the body, like digestion and metabolism, help extract and utilize energy from food. These energy-related functions involve multiple organs and enzymes working in coordination.

Biochemical Process: A biochemical process involves chemical reactions that occur within living organisms.



Knowledge Checkpoint



Gap Analyzer™
Homework

Watch Remedial



Remembering

Multiple Choice Questions:

- Which nutrient is the primary source of energy for the body?
(a) Vitamins ☐ (b) Minerals ☐ (c) Carbohydrates ☐ (d) Water ☐
- The process of breaking down food into absorbable nutrients is called:
(a) Respiration ☐ (b) Photosynthesis ☐ (c) Digestion ☐ (d) Circulation ☐
- Which of the following is NOT a macronutrient?
(a) Protein ☐ (b) Fat ☐ (c) Vitamin C ☐ (d) Carbohydrate ☐

Understanding

Short Answer Question:

Applying

- Give two benefits of eating a balanced diet and apply this by showing two daily practices that help maintain balance.
- Explain what a balanced diet is and apply this by giving two examples of meals that can provide it.

Analyzing

Long Answer Question:

- Explain why a balanced diet is crucial for overall health and well-being. Describe three different food groups that contribute to a balanced diet and discuss the importance of both variety and moderation in food consumption.

SUMMARY



1. Fueling Our Bodies

Our body needs energy to do everything—walking, talking, thinking, and even sleeping. This energy comes from the food we eat. Just like a car needs fuel to run, our body needs food as fuel. Eating the right kind of food helps us grow, stay active, and remain healthy. Mindful eating means we should think about what, when, and how much we eat so that our body gets the energy it needs in the right way.

2. Components of Food

Food is made up of different nutrients, and each nutrient has a special job in helping our body stay healthy. The main components of food are:

- **Carbohydrates:** These are our body's main source of energy. They help us stay active and do all our daily tasks.
- **Proteins:** They help us grow and repair our body. When we get hurt or tired, proteins help in healing and building muscles.
- **Fats:** They store energy for later use and also keep our body warm. But eating too much fat can lead to health problems.
- **Vitamins and Minerals:** These are needed in small amounts but are very important. They protect us from falling sick and keep our skin, eyes, and bones healthy.
- **Water:** It has no nutrients, but it is very important. It helps digest food, remove waste, and keep our body temperature normal.

3. Diseases Caused by Nutritional Gaps

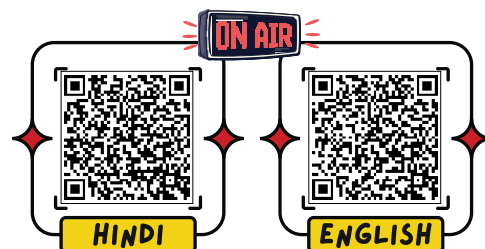
When our body does not get the required nutrients in the right amount, it may cause health problems. These are called deficiency diseases. For example:

- Lack of proteins can cause kwashiorkor, which leads to swelling, weakness, and poor growth in children.
- Lack of vitamin C causes scurvy, which leads to bleeding gums and weak immunity.
- Not getting enough iron causes anaemia, making a person feel tired and weak.
- Goitre is caused by lack of iodine and leads to swelling in the neck.

These diseases can make it hard for the body to grow and fight other infections. To stay healthy, we should eat a variety of food and avoid eating too much junk food or skipping meals. A proper and balanced diet helps in preventing these gaps.

4. Balanced Diet

A balanced diet includes all the nutrients in the right amounts. It should have fruits, vegetables, grains, pulses, milk products, and a little bit of fat and sugar. It is also important to drink plenty of water. A balanced diet keeps the body strong, supports growth, improves brain power, and prevents diseases. Mindful eating encourages us to choose healthy food over junk food and eat the right portions to stay fit and happy.



Example Based Questions



Multiple Choice Questions:

1. Which nutrient provides the main fuel for our body to do daily activities like walking, running, and studying?

- (a) Proteins
- (b) Carbohydrates
- (c) Fats
- (d) Vitamins

Answer: (b) Carbohydrates

Explanation: Carbohydrates are the primary source of energy for our body. They get broken down into glucose, which fuels all the body's cells and organs to function actively. Without enough carbohydrates, the body feels weak and tired.

2. A child has weak bones and often complains of pain while walking. Which nutrient is most likely lacking in the child's diet?

- (a) Vitamin C
- (b) Vitamin D
- (c) Iron
- (d) Protein

Answer: (b) Vitamin D

Explanation: Vitamin D helps in the absorption of calcium, which is essential for bone strength. Deficiency of Vitamin D causes rickets in children, where the bones become soft and bent. A balanced diet with sunlight exposure prevents this problem.

Short Answer Questions

5. Why are proteins called the "body-building foods"? Give two examples of protein-rich foods.

Answer: Proteins are called body-building foods because they help in the growth and repair of tissues. They are especially important for children, as their bodies are still developing, and for people recovering from injuries. Foods

like milk, eggs, pulses, and fish are rich in proteins.

6. How can a balanced diet prevent nutritional diseases?

Answer: A balanced diet contains all the nutrients—carbohydrates, proteins, fats, vitamins, minerals, water, and roughage—in the right amounts. If we eat a balanced diet, our body gets energy, grows properly, and builds immunity. This prevents nutritional diseases like scurvy (lack of Vitamin C), rickets (lack of Vitamin D), and anemia (lack of iron).

Lack of iron causes anemia, in which the blood cannot carry enough oxygen, making a person pale and weak.

Lack of Vitamin C causes scurvy, which results in bleeding gums, weakness, and delayed wound healing.

Long Answer Questions

8. Explain the importance of including all components of food in our meals. What may happen if one of the components is missing for a long time?

Answer: Each component of food plays a unique role in keeping the body healthy:

- Carbohydrates and fats provide energy.
- Proteins build and repair tissues.
- Vitamins and minerals protect us from diseases and regulate body functions.
- Water helps in digestion, transport of nutrients, and keeping the body cool.
- Roughage helps in proper bowel movement and prevents constipation.

If any one component is missing for a long time, the body may suffer from deficiency diseases. For example, lack of proteins can cause kwashiorkor (swollen body), lack of iron leads to anemia, and absence of Vitamin D results in weak bones. Therefore, a balanced diet with all components in the right amount is very important for overall growth and health.



Gap Analyzer™
Complete Chapter Test

EXERCISE



A. Choose the correct answer.

- Which nutrient provides quick energy?

(a) Proteins <input type="checkbox"/>	(b) Fats <input type="checkbox"/>
(c) Carbohydrates <input type="checkbox"/>	(d) Vitamins <input type="checkbox"/>
- Which is a rich source of fibre?

(a) Milk <input type="checkbox"/>	(b) Rice <input type="checkbox"/>
(c) Whole grains <input type="checkbox"/>	(d) Butter <input type="checkbox"/>
- Milletts are an example of:

(a) Fats <input type="checkbox"/>	(b) Nutrition-rich cereal <input type="checkbox"/>
(c) Vitamins <input type="checkbox"/>	(d) Proteins <input type="checkbox"/>
- Which test detects the presence of carbohydrate?

(a) Fat Test <input type="checkbox"/>	(b) Starch Test <input type="checkbox"/>
(c) Protein Test <input type="checkbox"/>	(d) Fibre Test <input type="checkbox"/>

B. Fill in the blanks.

- _____ provide long-lasting energy and support brain health.
- Milletts are an excellent source of _____ and are eco-friendly.
- Drinking sufficient water prevents _____.
- Deficiency of Vitamin A causes _____.
- Fibre improves _____ and prevents constipation.

C. Match the columns.

Column A	Column B
1. Starch Test	(a) Kwashiorkor
2. Protein Deficiency	(b) Blue-black color
3. Vitamins	(c) Regulate body processes
4. Fibre	(d) Prevents constipation
5. Milletts	(e) Nutrition-rich cereals

D. Write True or False.

- Milletts are low in nutrition and unsustainable. _____
- Vitamins and minerals regulate body processes. _____
- Fats provide quick energy like carbohydrates. _____
- Food miles refer to the energy food gives us. _____
- Fibre-rich foods include fruits and vegetables. _____

E. Define the following terms.

- | | |
|-----------------------|---------------|
| 1. Balanced diet | 2. Food miles |
| 3. Deficiency disease | 4. Fibre |
| 5. Millets | |

F. Assertion and Reason

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is NOT the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.
- (e) Both A and R are false.

1. **Assertion (A):** Carbohydrates are the body's primary source of energy.

Reason (R): Carbohydrates are broken down into glucose, which cells use for fuel.

2. **Assertion (A):** Eating a diet rich in fruits and vegetables can prevent many diseases.

Reason (R): Fruits and vegetables provide essential vitamins, minerals, and fiber, which protect the body.

3. **Assertion (A):** A balanced diet means eating only protein.

Reason (R): A balanced diet includes the right proportions of all necessary food components: carbohydrates, fats, proteins, vitamins, and minerals.

G. Give reasons for the following statements.

- 1. Millets are considered eco-friendly and nutritious.
- 2. Water is essential for maintaining body functions.
- 3. Balanced diets are important for preventing deficiency diseases.
- 4. Food miles influence sustainability.
- 5. Fibre-rich foods should be a part of daily meals.

H. Answer in brief.

- 1. Why are carbohydrates called energy-giving foods?
- 2. How does a deficiency of proteins affect children?
- 3. List two advantages of millets over regular cereals.
- 4. Why is hydration important for the body?
- 5. What does a balanced diet consist of?

I. Answer in detail.

- 1. Describe the role of carbohydrates, proteins, and fats in the body.
- 2. Explain the concept of food miles and how it impacts sustainability.
- 3. How can balanced diets prevent diseases caused by nutritional gaps?
- 4. Discuss the tests for carbohydrates, fats, and proteins with their procedure.
- 5. How do vitamins and minerals contribute to overall health?

SKILL-BASED PRACTICE



Activity Time

STEM

"Food Label Detective"

Materials Needed:

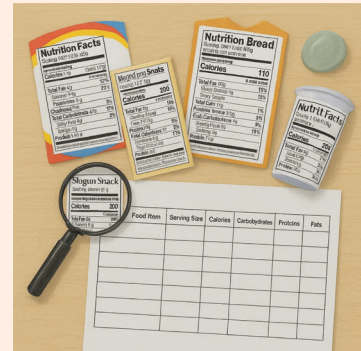
- Several food product labels, Magnifying glass (optional)
- Worksheet or notebook with columns for "Food Item," "Serving Size," "Calories," "Carbohydrates," "Proteins," "Fats," "Vitamins/Minerals."

Activity Steps:

- Choose Products:** Select 3-4 different packaged food items.
- Examine Labels:** Carefully read the nutrition facts on each food label.
- Record Data:** Fill in your worksheet with the information you find for each product.
- Compare:** Compare the nutritional content of different products.
- Discuss:** Based on the labels, discuss which items might be healthier choices and why.

Questions to Answer:

- What was the serving size for the cereal you examined?
- Which food item had the highest amount of fat per serving?
- What did you learn about the importance of reading food labels?



Materials Required

Skills Covered: Data Extraction, Nutritional Analysis, Critical Thinking, Understanding Food Labeling

Creativity

Art

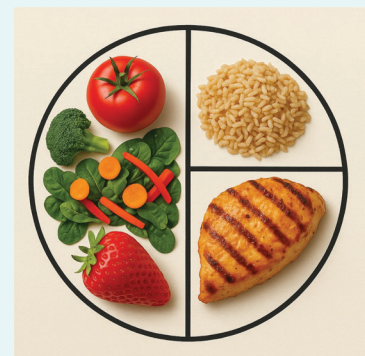
"Balanced Meal Plate Design"

Task: Draw or create a collage of a balanced meal plate for one sitting. Divide a large circle on your paper into sections representing the ideal proportions of different food groups (e.g., half fruits/vegetables, quarter grains, quarter protein). Then, draw or glue pictures of actual food items into each section to create a visually appealing and nutritionally balanced meal.

Materials to Use: Large drawing paper or cardboard, Markers, colored pencils, or paints, Old food magazines or printouts of food images, Scissors, glue

Questions to Answer:

- What food groups did you include on your balanced meal plate?
- How does your plate visually communicate the idea of "balance"?
- What is one new food combination or healthy meal idea you got from this activity?



Balanced Meal Plate Design

Skills Covered: Creativity, Understanding Food Groups, Visual Representation, Healthy Meal Planning

Nutritional Deficiency Inquiry

Group Activity

Diet Analysis & Gap Identification

Activity Instructions: Work in a group of 3-4 students.

1. **Diet Recall:** Each group member (or one designated person) briefly lists all the food and drinks they consumed yesterday, from breakfast to dinner, including snacks.
2. **Categorize & Analyze:** As a group, look at the combined list. Try to categorize the foods into primary nutrient groups (carbohydrates, proteins, fats, fruits/vegetables for vitamins/minerals).
3. **Identify Gaps:** Discuss if there are any noticeable "gaps" in the diet (e.g., not enough fruits/vegetables, too much sugar, not enough protein).
4. **Suggest Improvements:** Based on the identified gaps, suggest 2-3 specific, realistic changes that could make the diet more balanced.

Questions to Answer:

- What was one common food component that seemed to be lacking in the recalled diets?
- Suggest two specific food swaps or additions that could improve the nutritional balance of the diet.
- How does analyzing real diets help understand the importance of a balanced diet?

Skills Covered: Critical Thinking about Diet, Nutrient Identification, Self-Reflection on Eating Habits

Rohan's Lunchbox

Case Study

Rohan is a lively and curious student who enjoys playing football and participating in school activities. He usually brings his lunchbox from home. Today, when he opened it during the lunch break, it had a packet of potato chips, a chocolate bar, and a sugary fruit drink. These are some of Rohan's favorite treats, and he happily finishes his lunch in no time.

But something unusual has been happening lately. After lunch, during his afternoon classes or sports practice, Rohan often feels very tired and low on energy. He finds it hard to concentrate in class and doesn't feel as enthusiastic while playing outdoor games. His coach also noticed that Rohan gets tired faster than his teammates and seems to be lacking stamina.

Let's help Rohan explore what's missing from his meals and how he can improve his eating habits to stay active and healthy.

Guiding Questions:

1. What are the main components of Rohan's lunch?
2. Which essential food components appear to be missing or in very low amounts in Rohan's lunch?
3. Why might Rohan feel tired in the afternoon based on his lunch?
4. Suggest two healthier food items Rohan could add to his lunchbox to make it more balanced.

Skills Covered: Critical Thinking about Diet, Nutrient Identification, Problem-Solving for Health



Lunchbox

In 2023, the World Health Organization (WHO) reported that malnutrition affects millions worldwide. It appears in two forms:

Undernutrition – not getting enough food or nutrients. This can cause diseases like Kwashiorkor (protein deficiency, where children may look thin but have a swollen belly) or Marasmus (caused by very low energy intake).

Overnutrition – eating too much or the wrong types of food. In many developed countries, fast foods and sugary drinks are leading to obesity and Type 2 Diabetes.

Experts warn that malnutrition is a double burden for the world and suggest balanced diets and healthier eating habits as key solutions.

(Adapted from WHO Global Health Reports, 2023)

Guiding Questions & Tasks

1. Understanding Malnutrition

- What is the difference between “undernutrition” and “overnutrition”? Give one example of a disease for each.
- Why does a child suffering from Kwashiorkor have a swollen belly even if the rest of the body is thin?

2. Nutritional Gaps and Diseases

- Name two deficiency diseases (other than Kwashiorkor and Marasmus) and the specific nutrient that causes them.
- How can eating too many sugary and fatty foods lead to diseases like Type 2 Diabetes?

3. Achieving a Balanced Diet

- List three rules of a balanced diet that help prevent both undernutrition and overnutrition.
- Suggest two ways governments or communities can promote healthy eating habits.

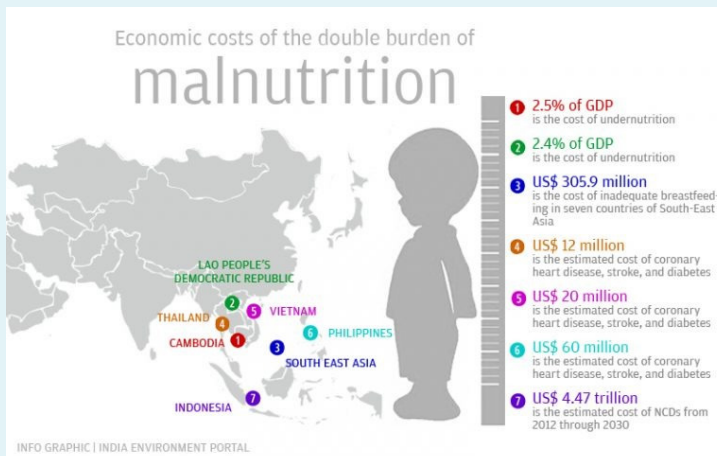


Image Credit: India Environment Portal

Skills Covered: Creativity, Understanding Food Groups, Visual Representation of Concepts