1 FOOD

Norman Ernest Borlaug also known as the "Father of the Green Revolution" was an American agronomist and a plant pathologist who led initiatives world wide that lead to the extensive increase in agricultural production. This came to be known as the Green Revolution. For his work, he was awarded with numerous awards, including the Nobel Peace Prize, the Presidential Medal of Freedom, and the Congressional Gold Medal. He developed semi-dwarf, high yield, disease-resistant varieties of wheat.

(1914 - 2009)

CONCEPT MAP

Food
(It is an essential requirement for all living organism)

- Based on mode of nutrition the living organisms are classified as
  - Autotrophs
  - Heterotrophs
    - Herbivores
    - Carnivores
    - Omnivores
- Varieties of food
  - A variety of food is consumed by different people. This depends on the taste, habits and life style of people.
- Sources of food
  - Plants
  - Animals

Concept 1

Introduction:

Food : All living beings require energy for work, growth, and repair. This energy is obtained from the food we consume, which fuels our body's functions.

Food Variety : We consume a wide range of foods, including rice, bread, vegetables, eggs, butter, sweets, and cheese, among others.

Knowledge Box

Nutrition is the process by which living organisms obtain and use food for energy, growth, and maintenance of life processes.

Ingredients of Food : The substances required to prepare any food item are known as ingredients. Preparing a dish often requires two or more ingredients.

Example : To cook boiled rice, the essential ingredients are rice and water. Similarly, preparing vegetable curry requires vegetables, salt, water, and spices.

Sources of Food : Plants and Animals are the main sources of food.

The food groups are summarised as follows:

(i) Cereals, Grains and Products :

Rice, Wheat, Ragi, Bajra, Maize, Jowar, Barley, Rice Flakes and Wheat Flour etc., come under this category.

Main nutrients provided : Energy, Protein, Invisible Fat, Vitamin - B_1, Vitamin - B_2, Folic Acid, Iron and Fibre.

(ii) Pulses and Legumes :

Bengal gram, Black gram, Green gram, Red gram, Lentil (whole as well as dals) Cowpea, Peas, Rajmah, Soyabeans and Beans etc., come under this category.

Main nutrients provided : Energy, Protein, Invisible Fat, Vitamin - B_1, Vitamin - B_2, Folic Acid, Calcium, Iron and Fibre.

(iii) Milk and Dairy Products : Milk, Curd, Skimmed Milk. Cheese etc., come under this category.

Main nutrients provided : Fat, Vitamin - B_{12} and Calcium.

(iv) Meat : Chicken(Liver), Fish, Egg, Meat etc., come under this category.

Main nutrients provided : Protein, Fat, Vitamin - B_2

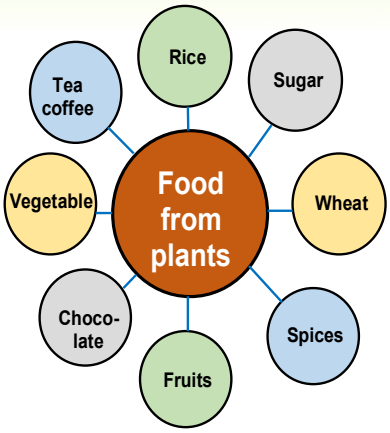
(v) Fruits and Vegetables : Mango, Guava, Ripe Tomato, Papaya, Orange, Sweet Lime, Watermelon etc., come under this category.

Main nutrients provided : Carotenoids, Vitamin - C and Fibre.

(vi) Vegetables (Green leafy) : Amaranth, Spinach, Drumstick Leaves, Coriander Leaves, Mustard Leaves, Fenugreek Leaves etc., come under this category.

Main nutrients provided : Invisible fats, Carotenoids, Vitamin - B_2, Folic Acid, Calcium, Iron and Fibre.

Food From Plant Sources :



Knowledge Box

Plants provide:
1. Cereals: Wheat, rice, maize.
2. Fruits and Vegetables: Apples, carrots, spinach.
3. Spices and Oils: Turmeric, mustard oil.

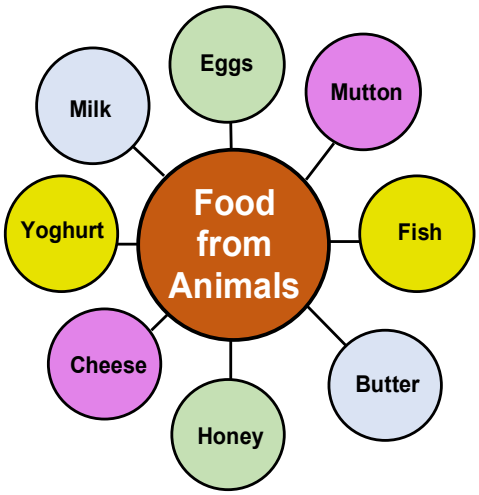
Rice, wheat, vegetables, fruits, etc., are obtained from plant sources. We get these ingredients from certain parts of different plants.

1. **Root:** We consume the roots of plants such as radish, carrot, turnip, potato, sweet potato, and beetroot.
2. **Stem:** Some plants store food in their stems, especially those that grow underground. Examples include ginger, potato, and onion, which are edible stems.
3. **Leaf:** Certain plants have edible leaves, such as spinach, lettuce, and fenugreek (Trigonella).
4. **Fruits:** We eat the fruits of many plants, including guava, apple, banana, mango, papaya, and orange.
5. **Oil seeds:** Many plant seeds are used for extracting oil. For instance, mustard oil comes from mustard seeds, while sunflower oil, coconut oil, groundnut oil, and soybean oil are obtained from the seeds of their respective plants.
6. **Sugar:** Sugar is primarily extracted from sugarcane and beetroot.
7. **Tea & coffee:** We use tea leaves to make tea and coffee beans to brew coffee.
8. **Spices**: Various spices such as pepper, cardamom, ginger, turmeric, cloves, and cumin are obtained from plants.

Some examples of various plants parts that are used as food

Fruit/Vegetable name	Edible part
Sweet potato, carrot, radish, turnip	Roots
Potato, sugar cane, ginger, turmeric	Stems
Cabbage, lettuce, spinach	Leaves
Cauliflower, broccoli, rose, banana, pumpkin	Flowers
Apple, mango, banana, orange, grapes	Fruits
Cereals (maize, wheat and rice), legumes, nuts and oil seed	Seeds

Food From Animal Sources :

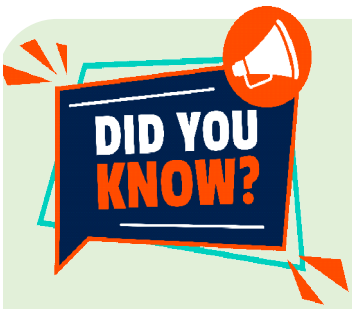


Knowledge Box

Animals provide: 1. Meat and Eggs : Chicken, fish, mutton. 2. Dairy Products : Milk, cheese, yogurt. 3. Honey : Produced by honeybees.

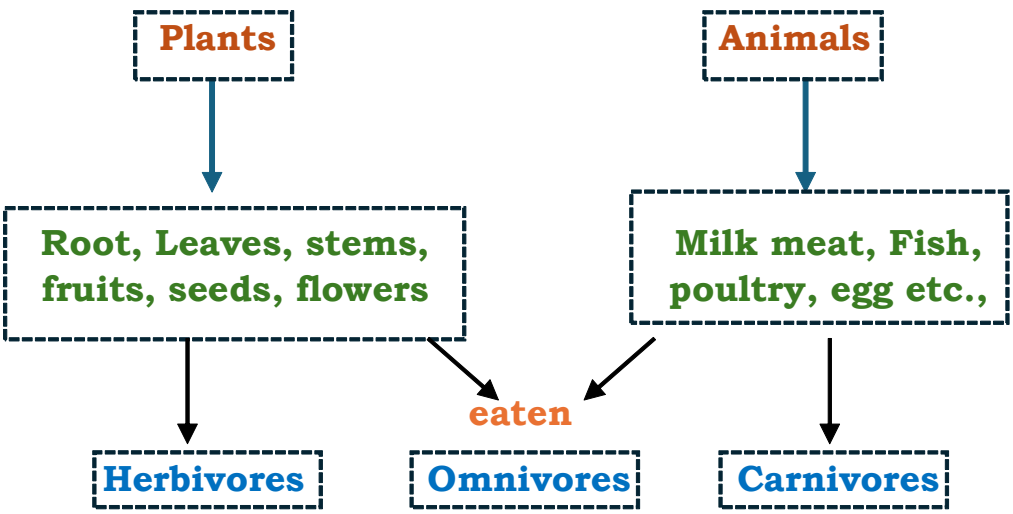
The main sources of animal foods are milk, eggs, meat, fish, honey etc.

Buffaloes and cows produce milk, while hens and ducks lay eggs. We obtain meat from animals such as goats, chickens, and hens. Both meat and eggs are excellent sources of protein. In coastal regions, fish is a staple food. Honeybees collect nectar from flowers to produce honey, which is rich in sugars, minerals, and enzymes.



One bee colony can produce over 27 kilograms of honey in a single season!

Food From Plants and Animals :



CLASSROOM DISCUSSION QUESTIONS CDQ 01

1. **What do all living things need energy for?**
   (A) Sleeping and resting
   (B) Doing work and for growth and repair
   (C) Observing nature
   (D) Creating new elements
2. **What are the materials needed to prepare any food item called?**
   (A) Elements
   (B) Nutrients
   (C) Ingredients
   (D) Vitamins
3. **What are the main sources of food?**
   (A) Plants and minerals
   (B) Animals and water
   (C) Plants and animals
   (D) Sunlight and soil
4. **Which part of the plant do we eat when we consume carrots?**
   (A) Stem
   (B) Root
   (C) Leaf
   (D) Flower
5. **Which of the following is NOT a food from animal sources?**
   (A) Eggs
   (B) Butter
   (C) Honey
   (D) Rice
6. **Which of the following is the main source of energy for our body?**
   (A) Vitamins
   (B) Food
   (C) Water
   (D) Oxygen
7. **Which food group includes lentils and black gram?**
   (A) Fruits
   (B) Pulses and Legumes
   (C) Cereals and grains
   (D) Dairy
8. **Pulses and legumes are a good source of which nutrient?**
   (A) Carbohydrates
   (B) Calcium
   (C) Proteins
   (D) Vitamin D
9. **The component of food that does not provide any nutrient to our body and yet is essential in our food is**
   (A) Fat
   (B) Carbohydrate
   (C) Roughages
   (D) None of the above
10. **Which of the following is a group of roots?**
    (A) Beetroot, Potato and ginger
    (B) Carrot, turmeric and ginger
    (C) Sweet potato, Radish and turmeric
    (D) Carrot, Beetroot and radish

MARK YOUR ANSWERS WITH PEN ONLY. Time Taken ☐ Minutes

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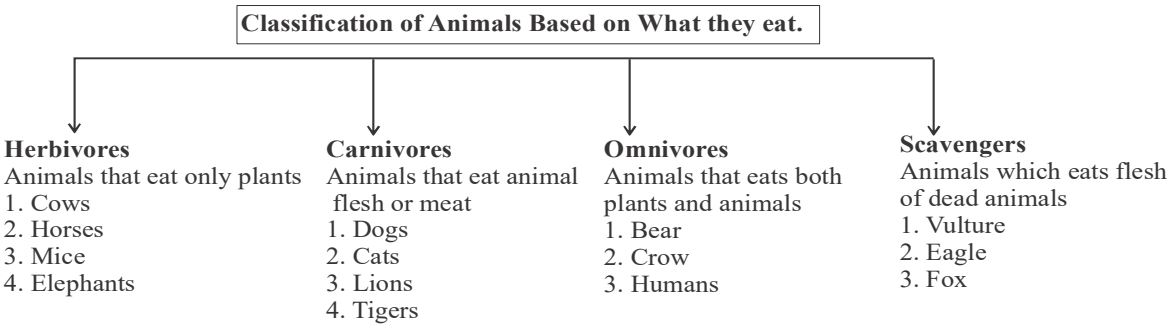
Concept 2

Modes of Nutrition :

1. **Autotrophs**: Plants have the ability to produce their own food through the process of photosynthesis, which is why they are known as autotrophs. **Example:** All green plants
2. **Heterotrophs:** Unlike plants, animals, including humans, cannot produce their own food. They rely on plant-based food sources for survival. Based on their dietary habits, heterotrophs are classified into the following categories:



a) Herbivores : These are animals that feed exclusively on grass and plant-based products. Examples include cows, elephants, camels, deer, and goats.

b) Carnivores : These animals consume the flesh of other animals for sustenance. Examples include lions, jackals, frogs, tigers, and lizards.

c) Omnivores : These animals eat both plant-based foods and meat. Examples include crows, monkeys, bears, humans, and sparrows.

d) Scavengers : These animals feed on the remains of dead animals. Examples include vultures, eagles, and foxes.

Life Processes :

The basic functions performed by living organisms to maintain their life on this earth are called life processes.

Basic life processes common to all living organisms are:

Basic life processes	Function
Nutrition	Taking of food inside the body and converting it into smaller molecules which can be absorbed by the body.
Respiration	The process which releases energy from the food absorbed by the body.
Transport	The process in which a substance absorbed or made in one part of the body is moved to other parts of the body.
Excretion	The process in which the waste materials produced in the cells of the body are removed from the body.
Control and Coordination	A process which helps the living organisms to survive in the changing environment around them.
Growth	The process involves the changes from a smaller organism to a big organism.
Movement	The organism either moves from one place to another or moves its body parts.
Reproduction	The process involves the making of more organisms form the existing once.

Nutrition in Living Organisms:

All living organisms require energy to carry out various life processes. This energy is derived from food, which acts as a fuel for sustaining life.

Nutrient:

A nutrient is a substance that an organism acquires from its surroundings and utilizes either as a source of energy or for building and maintaining its body structures.

Example:

i) Carbohydrates and fats serve as primary sources of energy for organisms.
ii) Proteins and mineral salts contribute to the biosynthesis of body components such as skin and blood.

Nutrition :

Nutrition refers to the process of consuming essential nutrients (such as carbohydrates, fats, proteins, minerals, vitamins, and water) and utilizing them for growth, energy production, and maintenance of bodily functions.

Different modes of nutrition :

The mode of nutrition describes the method by which an organism obtains its food. There are two primary types:

1. Autotrophic mode of nutrition
2. Heterotrophic mode of nutrition

Autotrophic nutrition:

Autotrophic nutrition is that mode of nutrition in which an organism makes (or synthesizes) its own food from the simple inorganic materials like carbon dioxide and water present in the surroundings (with the help of sunlight energy).

Knowledge Box

Autotrophic organisms, like plants, use sunlight, water, and carbon dioxide to produce food through photosynthesis.

Those organisms which can make their own food from carbon dioxide and water are called **autotrophs**. Autotrophs make their food by **photosynthesis.**

Example: All green plants and autotrophic bacteria.

Heterotrophic nutrition:

Heterotrophic nutrition is that mode of nutrition in which an organism cannot make (or synthesizes) its own food from simple inorganic materials like carbon dioxide and water, and depends on other organisms for its food.

Knowledge Box

Heterotrophic organisms depend on other organisms for food. Examples include humans, animals, and fungi.

Those organisms which cannot make their own food from inorganic substances like carbon dioxide and water, and depends on other organisms for their food are called heterotrophs.

Example: All the animals (man, dog, cat, lion, etc.), most bacteria and fungi.

CLASSROOM DISCUSSION QUESTIONS

CDQ 02

1. What are autotrophs?

(A) Organisms that eat both plants and animals

(B) Organisms that make their own food through photosynthesis

(C) Organisms that depend on other organisms for food

(D) Organisms that eat only meat

2. Which category of animals includes cows, horses, and elephants based on their diet?

(A) Carnivores (B) Omnivores

(C) Herbivores (D) Scavengers

3. What process releases energy from the food absorbed by the body?

(A) Nutrition (B) Excretion

(C) Respiration (D) Reproduction

4. What is the process called in which waste materials produced in the cells of the body are removed?

(A) Growth (B) Transport

(C) Excretion (D) Movement

5. Which of the following is an example of a nutrient used mainly as a source of energy?

(A) Proteins

(B) Minerals

(C) Carbohydrates

(D) Vitamins

6. Which process do autotrophs use to make their food?

(A) Digestion

(B) Respiration

(C) Photosynthesis

(D) Fermentation

7. What are heterotrophs?

(A) Organism that produce their own food

(B) Animal that depend on plants or other animals for food

(C) Organisms that do not need food

(D) Plants that grow in water

8. Which of the following is an omnivore?

(A) Lion (B) Human

(C) Camel (D) Cow

9. Which of the following organisms exhibit heterotrophic nutrition ?

(A) Plants

(B) Algae

(C) Fungi

(D) Cyano bacteria

10. What is the primary source of energy for autotrophic organisms

(A) Glucose

(B) Sunlight

(C) Oxygen

(D) Carbondioxide

MARK YOUR ANSWERS WITH PEN ONLY. Time Taken ☐ Minutes

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Concept 3

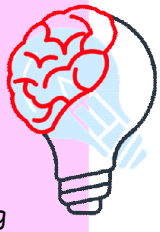
Types of Heterotrophic Nutrition :

Heterotrophic mode of nutrition is of three types:

1. Saprotrophic nutrition
2. Parasitic nutrition
3. Holozoic nutrition

1. Saprotrophic Nutrition :

Knowledge Box



1. Saprophytic Nutrition : Feeding on dead and decaying matter (e.g., fungi).
2. Parasitic Nutrition : Deriving food from a host (e.g., tapeworms).
3. Holozoic Nutrition : Ingesting and digesting food (e.g., humans).

Saprotrophic nutrition is that nutrition in which an organism obtains its food from decaying organic matter of dead plants, dead animals and rotten bread, etc.

The organisms having saprotrophic mode of nutrition are called Saprophytes. Saprophytes are the organisms which obtain food from dead plants (like rotten leaves), dead and decaying animal bodies, and other decaying organic matter.

You may have observed umbrella-shaped structures growing on decaying matter—these are saprophytic organisms.

Additionally, black and white spots often appear on bread, pickles, or other moist food items. These spots result from the growth of fungi.

Example: Fungi (such as bread mold), mushrooms, and various bacteria.

2. Parasitic Nutrition :

Parasitic nutrition is a mode of nutrition in which an organism derives its food from another living organism, known as the host, without causing its immediate death. The organism that depends on the host for nourishment is called a parasite. Parasites can be plants or animals and rely on their host for survival.

Insectivorous plants – It may seem surprising, but some plants are capable of consuming insects. These plants primarily synthesize their own food through photosynthesis but supplement their nutrition by capturing and digesting insects. Their leaves are specially adapted to trap insects, enabling them to fulfill their nitrogen requirements. Since they are green in color, they can still manufacture their own food through photosynthesis.

Example:

Parasitic Organisms: Some animals, such as Plasmodium (which causes malaria) and roundworms, depend on a host for survival.

Parasitic Plants: Cuscuta (also known as Amarbel) is a total stem parasite, whereas Mistletoe is a partial parasite.

Other Parasites: Several fungi and bacteria also exhibit parasitic nutrition.

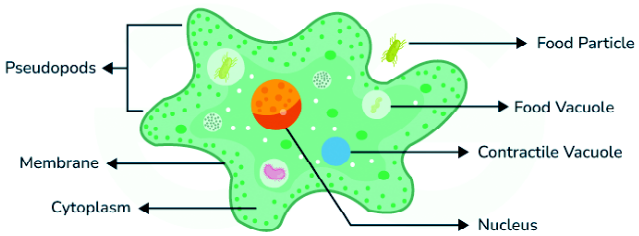
3. Holozoic Nutrition :

Holozoic nutrition is a process where organisms consume complex food materials through ingestion. The food is then digested into simpler substances, followed by absorption into body cells for energy and growth.

Examples: This type of nutrition is found in humans and most animals.

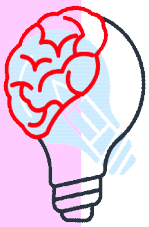
Holozoic Nutrition in Organisms: Many organisms, from unicellular Amoeba to multicellular humans, follow holozoic nutrition.

Holozoic Nutrition in Amoeba: Amoeba engulfs food through phagocytosis. Inside the cell, a food vacuole forms, where digestive enzymes break down food into smaller, usable nutrients. These nutrients provide energy and support growth.



Knowledge Box

Plants absorb water and minerals through roots and prepare food in leaves using sunlight, carbon dioxide, and chlorophyll.



Nutrition in plants (Autotrophic nutrition) :

Green plants are autotrophic and synthesize their own food by the process of photosynthesis. The process, by which green plants make their own food from carbon dioxide and water by using sunlight energy in the presence of chlorophyll, is called **photosynthesis**.

1. Oxygen is released during photosynthesis.
2. The process of photosynthesis can be represented as:

$$6CO_2 + 6H_2O \xrightarrow[chlorophyll]{light} C_6H_{12}O_6 + 6O_2$$

3. The process of photosynthesis takes place in the green leaves of a plant.
4. The food is prepared by the green leaves of a plant in the form of a simple sugar called glucose.

5. The extra glucose is changed into another food called starch. This starch is stored in the leaves of the plant.

6. The green plants convert sunlight energy into chemical energy by making carbohydrates.

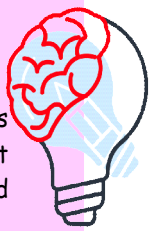
The photosynthesis takes place in the following three steps:

a) Absorption of sunlight energy by chlorophyll.

b) Conversion of light energy into chemical energy, and splitting of water into hydrogen and oxygen by light energy.

c) Reduction of carbon dioxide by hydrogen to form carbohydrates like glucose by utilizing the chemical energy.

Knowledge Box



Photosynthesis is the process by which plants convert sunlight, carbon dioxide, and water into glucose and oxygen.

$6CO_2 + 6H_2O + \text{Sunlight} \rightarrow C_6H_{12}O_6 + 6O_2$

Conditions necessary for photosynthesis:

1.Sunlight 2.Chlorophyll 3.Carbon dioxide 4.Water

How the plants obtain carbon dioxide?

The surface of plant leaves contains a large number of tiny pores known as stomata. These stomata play a crucial role in the exchange of gases, allowing carbon dioxide to enter the leaves for photosynthesis. Each stomatal pore is surrounded by a pair of guard cells, which regulate its opening and closing. When water enters the guard cells, they swell, become curved, and cause the stomatal pore to open, facilitating gas exchange. Conversely, when guard cells lose water, they shrink, become straight, and result in the closure of the stomatal pores, preventing excessive water loss. This dynamic regulation of stomata helps the plant efficiently manage both photosynthesis and transpiration.

How the plants obtain water for photosynthesis ?

1. The water required by the plants for photosynthesis is absorbed by the roots of the plants from the soil through the process of osmosis.
2. The water absorbed by the roots of the plants is transported upward through the xylem vessels to the leaves where it reaches the photosynthetic cells.
3. Plants also require additional raw materials such as nitrogen, phosphorus, iron, and magnesium for their growth and development. These essential nutrients are absorbed from the soil. Nitrogen, in particular, plays a crucial role in the synthesis of proteins and other vital compounds needed for the plant's overall functioning.
4. Photosynthesis takes place in chloroplasts, which contain chlorophyll. Chloroplasts are found in the mesophyll cells of green leaves, where they have more chlorophyll than other plant cells, making them the primary site for photosynthesis.

CLASSROOM DISCUSSION QUESTIONS CDQ 03

1. **What defines saprotrophic nutrition?**
   (A) Obtaining food from living organisms
   (B) Deriving food from decaying organic matter
   (C) Feeding on another living organism
   (D) Absorbing nutrients through haustoria
2. **Which organism is an example of a saprophyte?**
   (A) Plasmodium (B) Mushroom
   (C) Roundworm (D) Mistletoe
3. **How does a parasite obtain its food?**
   (A) By synthesizing it from sunlight
   (B) By absorbing nutrients through haustoria
   (C) By hunting and killing prey
   (D) By ingesting complex organic materials
4. **What distinguishes holozoic nutrition from other types?**
   (A) It involves ingesting food
   (B) It exclusively relies on decaying matter
   (C) It requires parasitic interactions
   (D) It occurs only in fungi
5. **Which process is characteristic of photosynthesis?**
   (A) Respiration
   (B) Transpiration
   (C) Digestion
   (D) Light energy
6. **What is the primary role of chlorophyll in photosynthesis?**
   (A) Absorbing sunlight energy
   (B) Transporting water
   (C) Releasing oxygen
   (D) Storing glucose
7. **How do plants obtain carbon dioxide for photosynthesis?**
   (A) Through the stomata
   (B) From the soil
   (C) Through osmosis
   (D) From other plants
8. **What is the function of guard cells surrounding stomata?**
   (A) Absorbing sunlight
   (B) Transporting water
   (C) Controlling stomatal opening
   (D) Releasing oxygen
9. **Which raw material is essential for building proteins in plants?**
   (A) Carbon dioxide
   (B) Nitrogen
   (C) Water
   (D) Chlorophyll
10. **Where does photosynthesis primarily occur in a plant cell?**
    (A) Xylem vessels
    (B) Guard cells
    (C) Mesophyll cells
    (D) Stomata

MARK YOUR ANSWERS WITH PEN ONLY. Time Taken ☐ Minutes

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Concept 4

Nutrition in Animals :

There are five steps in the process of nutrition in animals.

i) **Ingestion:** The process of taking food into the body is called ingestion.

ii) **Digestion:** The process in which the food containing large, insoluble molecules is broken down into small, water soluble molecules is called digestion.

iii) **Absorption:** The process in which the digested food passes through the intestinal wall into blood stream is called absorption.

iv) **Assimilation:** The process in which the absorbed food is taken in by the body cells and used for energy, growth and repair is called assimilation.

v) **Egestion:** The process in which the undigested food is removed from the body is called egestion.

Knowledge Box

Animals consume food to obtain energy for growth, repair, and performing life processes.

Food nutrients – functions, sources and daily needs :

Nutrient in food	Roles/Functions	Sources	Daily needs
Carbohydrates (Energy-providing foods)	Main source of energy	Wheat, Rice, Maize, Potato, Bread, Honey, Common sugar, Milk, Banana	Adult person doing light work needs 600g.
Proteins (Body-building foods)	(i) For body building (ii) For digestion (iii) Growth (iv) Energy (iv) Body protection from infections	Pulses (peas, soyabean), Egg, Meat, Paneer, Cheese, Groundnut, Milk, Fish	Adults require 1 g for every 1 kg of body weight; children, require 1.46 g for every 1 kg of body weight; women during pregnancy and lactation period also require more proteins.
Fats (Energy-providing foods)	(i) Energy source (ii) Taste and flavour (iii) Reserve food source	Butter, Cheese Vegetable oil (coconut oil, Groundnut oil, Sunflower oil), Nuts, Milk, Animal fat from meat	Adults require 70 - 80 g
Water	(i) Medium for body reactions (ii) Transport of substances (iii) Digestion (iv) Waste removal (v) Maintenance of constant body temp.	Drinking water Cucumber (96%) Spinach (92%) Tomatoes (94%) Watermelon (96%) Grapes (90%) Carrot (90%)	6 to 8 Glasses
Roughage	(i) Being rich in fibre, it absorbs water and helps in food movement inside the intestine (ii) Helps in bowl movement by preventing constipation	Spinach, cabbage, beans, peas, cereals, wheat, lady's-finger	12.8 to 14.8 grams

CLASSROOM DISCUSSION QUESTIONS

CDQ 04

1. **Which among the following is a rich source of protein?**
   (A) Pumpkin
   (B) Mushroom
   (C) Chickpea
   (D) Orange
2. **Fruits are rich in**
   (A) Vitamins
   (B) Minerals
   (C) Water
   (D) All the above
3. **Which of the following food is a source of fats?**
   (A) Pulses
   (B) Butter
   (C) Rice
   (D) Cucumber
4. **Which among the following is correctly matched?**
   (A) Goat-milk, meat
   (B) Lettuce - roots
   (C) Cauliflower - fruit
   (D) Potato - root
5. **Which food is highest in water content?**
   (A) Tomatoes (94%)
   (B) Carrot (90%)
   (C) Watermelon (96%)
   (D) Grapes (90%)
6. **What is the primary source of Vitamin C?**
   (A) Fish (B) Milk
   (C) Oranges (D) Wheat germ
7. **What is the process of taking food into the body called?**
   (A) Digestion
   (B) Assimilation
   (C) Ingestion
   (D) Egestion
8. **Which nutrient is the main source of energy in the body?**
   (A) Proteins
   (B) Carbohydrates
   (C) Fats
   (D) Roughage
9. **What is the role of fats in the body?**
   (A) Bodybuilding
   (B) Energy source
   (C) Transport of substances
   (D) Medium for body reactions
10. **What is the function of roughage in the diet?**
    (A) Enhances taste and flavour
    (B) Absorbs water and aids in bowel movement
    (C) Provides reserve food source
    (D) Acts as a medium for body reactions

MARK YOUR ANSWERS WITH PEN ONLY. Time Taken ☐ Minutes

1 Ⓐ Ⓑ Ⓒ Ⓓ	2 Ⓐ Ⓑ Ⓒ Ⓓ	3 Ⓐ Ⓑ Ⓒ Ⓓ	4 Ⓐ Ⓑ Ⓒ Ⓓ	5 Ⓐ Ⓑ Ⓒ Ⓓ
6 Ⓐ Ⓑ Ⓒ Ⓓ	7 Ⓐ Ⓑ Ⓒ Ⓓ	8 Ⓐ Ⓑ Ⓒ Ⓓ	9 Ⓐ Ⓑ Ⓒ Ⓓ	10 Ⓐ Ⓑ Ⓒ Ⓓ

R.K.C. (Review of Key Concepts)

1. Nutrition is the science that interprets the interaction of nutrients and other substances in food in relation to maintenance, growth, reproduction, health and disease of an organism. It includes food intake, absorption, assimilation, biosynthesis, catabolism and excretion.
2. Carbohydrates and fats are the nutrients which are used by the organism mainly as a source of energy.
3. Proteins and mineral salts are nutrients used by organism for the biosynthesis of its body constituents like skin, blood, etc.
4. Saprotrophic nutrition is that nutrition in which an organism obtains its food from decaying organic matter.
5. Organisms which can make their own food from carbon dioxide and water are called autotrophs. Autotrophs make their food by **photosynthesis.**
6. Organisms which cannot make their own food from inorganic substances like carbon dioxide and water, and depends on other organisms for their food are called heterotrophs.
7. A parasite is an organism (plant or animal) which feed on another living organism called its host.
8. The holozoic nutrition is that nutrition in which an organism takes the complex organic food materials into its body by the process of ingestion.
9. The process of photosynthesis can be represented as:

$$6CO_2 + 6H_2O \xrightarrow[chlorophyll]{light} C_6H_{12}O_6 + 6O_2$$

10. All the animals can be divided into three groups on the basis of their food habits. They are Herbivores (Plant eaters), Carnivores (Flesh eaters) and Omnivores (Both plant and flesh eaters).
11. There are five major types of nutrition of animals. They are Ingestion, digestion, absorption, assimilation and egestion.
12. The process of taking food into the body is called ingestion.
13. The process in which the food containing large, insoluble molecules is broken down into small, water soluble molecules is called digestion.
14. The process in which the digested food passes through the intestinal wall into blood stream is called absorption.
15. The process in which the absorbed food is taken in by the body cells and used for energy, growth and repair is called assimilation.
16. The process in which the undigested food is removed from the body is called egestion.

Advanced Worksheet

LEVEL 1

Single Correct Answer Type (S.C.A.T.)

1. Living organisms spend energy as they perform various activities. They derive their energy from :

(A) Food
(B) Clothes
(C) House
(D) None of these

2. Food is required by the body for the purposes like :

(A) For energy and growth
(B) For repair of damaged body parts.
(C) For protection from diseases and infection
(D) All the above.

3. The main source of our food are:

(A) Plants
(B) Animals
(C) Both (A) & (B)
(D) None of the above.

4. The parts of the plant which can be used as source of food are :

(A) Root
(B) Stem & flowers
(C) Seeds
(D) All the above.

5. Seeds of mustard are used as :

(A) Oil
(B) Ghee
(C) Soap
(D) Detergent.

6. Lack of Roughage in our diet results in :

(A) Constipation.
(B) Lack of consciousness.
(C) Bleeding of Gums.
(D) Dental Decay.

7. What do you call carrot pudding?

(A) Sudji halwa
(B) Kulfi
(C) Gaajar ka halwa
(D) Kheer

8. What is the source of 'Rice' ?

(A) Air
(B) Plant
(C) Animal
(D) River

9. What is the source of 'Egg' ?

(A) Air
(B) Animal
(C) Plant
(D) Water

10. Animal provide us which of the following ?

(A) Egg and Vegetables
(B) Vegetable and rice
(C) Spices and meat
(D) Egg, milk and Meat

11. Which part of mustard plant gives 'oil' ?

(A) Roots
(B) Flowers
(C) Stems
(D) Seeds

12. Animals that feed on plants only are known by which name?
(A) Herbivores
(B) Carnivores
(C) Omnivores
(D) Scavengers

13. Animals that feed on flesh only are known by which name ?
(A) Omnivores
(B) Carnivores
(C) Herbivores
(D) Scavengers

14. Animals that feed on plant and animal flesh both are known by which name ?
(A) Carnivores
(B) Herbivores
(C) Omnivores
(D) Scavengers

15. Bees collect which of the following for 'Honey' ?
(A) Fruit
(B) Root
(C) Nectar
(D) Pollen grains

16. Which part of 'Pumpkin plant' do we eat ?
(A) Fruit
(B) Root
(C) Stem
(D) All of these

17. Which one of the following is true about food ?
(A) Food is essential for our survival
(B) Food is essential for keeping us healthy and fit
(C) Food is essential for our growth
(D) All of these

18. Which one of the following statements is true ?
Statement 1: Animals depend on plants for their food.
Statement 2: Plants depend on animals for their food.
(A) Statement 1
(B) Statement 2
(C) Both statements are true
(D) Both statements are false

19. The animals that eat dead and decaying organic substances are called :
(A) Herbivores
(B) Carnivores
(C) Omnivores
(D) Scavengers

20. Choose the food substance from the following which is animal product.
(A) Pulses
(B) Rice
(C) Honey
(D) Fruits

21. The animal 'crocodile' belongs to which one of the following groups ?
(A) Herbivores
(B) Carnivores
(C) Omnivores
(D) All of these

22. Choose the food from the following which is a plant product :
(A) Milk
(B) Egg
(C) Fruits
(D) Meat

23. Look at the following statements

Statement 1: The living organisms which can prepare their own food are called producers

Statement 2: The living organisms which consumes the food prepared by plants are called consumers.

Which of the above statements is correct ?

(A) Statement 1 is correct

(B) Statement 2 is correct

(C) Both statements are correct

(D) Both statements are incorrect

24. The process of intake of food by animals and plants is called :

(A) Excretion

(B) Transportation

(C) Nutrition

(D) Respiration

25. In leaves, Photosynthesis takes place in :

(A) Mitochondria

(B) Ribosomes

(C) Chloroplast

(D) Lysosomes

26. The correct equation for photosynthesis is :

(A) $CO_2 + H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$

(B) $6CO_2 + 6H_2O \xrightarrow[chlorophyll]{light} C_6H_{12}O_6 + 6O_2 + 6H_2O$

(C) $7CO_2 + 8H_2O \rightarrow C_6H_{12}O_6 + 5O_2 + 6H_2O$

(D) $5CO_2 + 10H_2O \xrightarrow[chlorophyll]{sun\ light} C_6H_{12}O_6 + 6O_2 + 7H_2O$

27. The presence of which carbohydrate is regarded as an evidence of photosynthesis :

(A) Starch

(B) Insulin

(C) Fructose

(D) Lactose

28. Green plant use which of the following to prepare food ?

(A) Carbon dioxide

(B) Sunlight

(C) Water

(D) All of these

29. The process, by which green plants prepare their own food is known as :

(A) Photosynthesis

(B) Respiration

(C) Symbiosis

(D) None of these

30. The green colour pigment in the leaves is :

(A) Chlorophyll

(B) Anthocyanin

(C) Protoplast

(D) Chloroplast

31. Animals cannot carry out photosynthesis because they :

(A) Lack chlorophyll

(B) Lack cellulose

(C) Cannot use oxygen

(D) Cannot absorb mineral salts

32. Which gas is released during photosynthesis ?

(A) Helium

(B) Nitrogen

(C) Carbon dioxide

(D) Oxygen

33. Insectivorous plants among the plants given below.
(A) Hibiscus
(B) Teak
(C) Nepenthes
(D) Aloe vera

34. Which of the following is an insectivorous plant?
(A) Cuscuta plant
(B) Lichen
(C) Pitcher plant
(D) Hibiscus

35. Transport of food prepared in leaves to other part of plant takes place through :
(A) Trachieds of xylem
(B) Vessels of xylem
(C) Sieve tube of phloem
(D) Companion cells of phloem

36. Grains, legumes and eggs are considered as dietary sources of:
(A) Carbolic acid
(B) Proteins
(C) Citric acid
(D) Carboxylic acid

37. Nutrients that are required by living organisms in smaller quantities are considered as :
(A) Micronutrients
(B) Macronutrients
(C) Mega nutrients
(D) Chemical nutrients

38. Problems related to nutrition of nutrients is called :
(A) Malnutrition
(B) Solubility of nutrition
(C) Insolubility of nutrition
(D) Balancing of nutrition

39. Disease in children which is caused by deficiency of vitamin D is :
(A) Scurvy
(B) Anaemia
(C) Rickets
(D) Insomnia

40. Sources of vitamin C does not includes :
(A) UV from Sun
(B) Beef liver
(C) Citrus fruits
(D) Leafy green vegetables

41. Term anaemia means :
(A) Lack of nitrogen
(B) Lack of carbon dioxide
(C) Lack of oxygen
(D) Lack of blood

42. Organisms that obtain minerals, water and carbon dioxide from their own environment to prepare food are classified as :
(A) Heterotrophic organisms
(B) Autotrophic organisms
(C) Prokaryotic organisms
(D) Eukaryotic organisms

43. Diet which contains required essential nutrients in right proportions is :
(A) Opsin diet
(B) Insoluble diet
(C) Balanced diet
(D) Soluble diet

44. Which of the following is not an insectivores plant?
(A) Dionaea
(B) Nepenthes
(C) Ageratum
(D) Sundew

45. Which of the following plant traps and digest insects?
(A) Cuscuta plant
(B) Sunflower plant
(C) Cactus plant
(D) Pitcher plant

46. Holozoic mode of nutrition is observed in :
(A) Monera
(B) Animalia
(C) Plantae
(D) Protozoa

47. Which of the following nutrients is rich in short and medium chain fatty acids?
(A) Milk
(B) Peanut oil
(C) Sunflower oil
(D) Almond oil

48. Person who has had a renal transplant should regulate the intake of __.
(A) Carbohydrates
(B) Proteins
(C) Fats
(D) Vitamins

49. Nutrition in amoeba is :
(A) Holophytic
(B) Parasitic
(C) Holozoic
(D) Saprobiotic

50. What is absent in amoeba ?
(A) Mitrochondria
(B) Golgi body
(C) Centriole
(D) All of these

51. Amoeba has :
(A) Lobopodia
(B) Filopodia
(C) Reticulopodia
(D) Axopodia

Analytical Approach Type (A.A.T.)

52. Which of the following are obtained from animals used as food ?
i) Eggs
ii) Milk
iii) Meat
iv) Horns & Hoofs
(A)(i) & (ii)
(B) (iii) & (iv)
(C) (i), (ii) & (iii)
(D) All of the above

53. Which of the following are examples for 'Spices' ?
i) Pepper
ii) Coffee beans
iii) Turmeric
iv) Cloves
(A) (i) & (ii)
(B) (iii) & (iv)
(C) (ii) & (iii)
(D) (i), (iii) & (iv)

54. Which of the following pairs are CORRECT ?
i) Vitamin - C : Scurvy
ii) Vitamin - D : Rickets
iii) Iodine - Anaemia
iv) Iron - Goitre
(A) (i) & (ii)
(B) (ii) & (iii)
(C) (i) & (iii)
(D) All of the above

55. Which of the following organisms is a sporophyte?

i) Fungi **ii) Mushroom**

iii) Cow **iv) Tape worm**

(A) (i) & (ii)

(B) (iii) & (iv)

(C) (i) & (ii)

(D) All of the above

56. Which of the following pairs are CORRECT ?

i) Cereals – Vitamin B_1, Vitamin B_2

ii) Pulses – Vitamin B_2, Calcium

iii) Fruits and Vegetables - Beef liver

iv) Legumes, grains – Carboxylic acid

(A) (i) & (ii)

(B) (iii) & (iv)

(C) (i), (ii) & (iii)

(D) All of the above

Matrix Matching Type (M.M.T.)

SET I

Column - I

57. Omnivores

58. Herbivore

59. Sanguivore

60. Carnivore

Column - II

(A) Lion

(B) Leech

(C) Bear

(D) Cow

(E) Crow

SET II

Column-I

61. Vitamin - A

62. Vitamin - C

63. Vitamin - D

64. Vitamin - B

Column-II

(A) Anaemia

(B) Rickets

(C) Night blindness

(D) Scurvy

BENEFITS OF LEMON HONEY IN WARM WATER

Most of you have seen commercials around the benefits of Lemon and Honey in warm water for weight loss. Well, there is more to it than just weight loss and this blog will help you discover the benefits of this magic drink:

Purification of Liver:

Helps purify the liver which is the main organ that helps cleanse the body, produces protein and ensures good digestion process. It is essential to keep the liver up and running for your well being.

Aids weight loss:

As stated above, this drink helps purify the liver and when that's done, body's digestion process automatically accelerates and aids in weight loss.

Increases immunity:

This drink has an immunomodulating effect that helps increase body's immunity and saves you against diseases like common cold, seasonal illness etc. Also, this drink is rich in Vitamin C, Vitamin D, Phosphorus, Magnesium and Calcium which are essential for your body.

Helps reduce acne:

The oil-cutting property of lemons helps reduce oil from the face. Citric acid works to remove dead skin cells and acts like an exfoliating agent.

Helps reduce constipation:

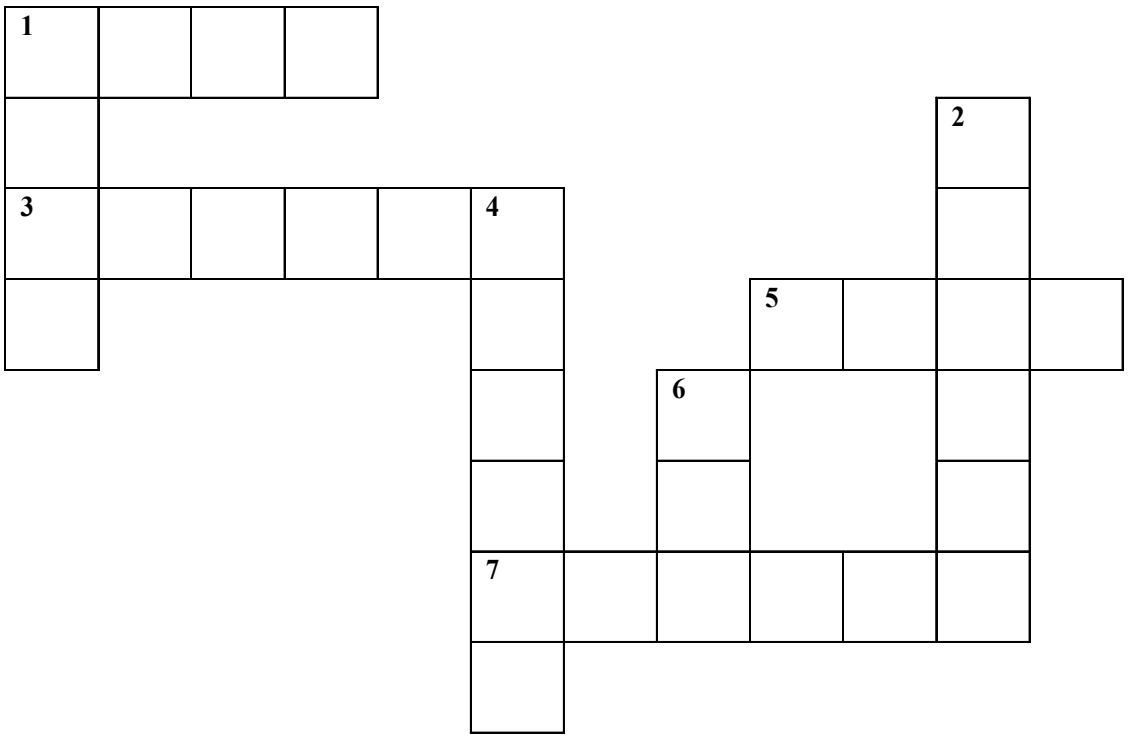
This drink helps things to move smoothly as warm water aids clearing of the stomach and flushing down stuff. Lemons on the other hand lighten the fluid secretion in the body like less mucus in the intestines that helps in reducing constipation.

Helps reduce throat infection, cough and cold congestion:

Honey has peroxides that act as disinfectants. Honey helps reduce bacteria and inflammation from the throat. When had along with lemon, it helps cure cold and cough as lemon helps reduce mucus production and dries up the respiratory tract.

Start exploring the beautiful and healthy world of lemon honey in warm water from today! This is tried and tested by us and totally recommended.

Tip: Best had empty stomach in the morning.



***Across*: (→)**

1. The edible part of beet.
3. A dairy product used as a topping on pizza.
5. A legume commonly used in vegetable dishes.
7. The edible part of the lettuce.

***Down*: (↓)**

1. A cereal crop cultivated by transplantation method.
2. A food chain starts with them.
4. The edible part of a plant.
6. A beverage.