

PARAGON CONVENT SCHOOL

SECTOR : 24 B, CHANDIGARH

LESSON – 2

MICROORGANISMS : FRIEND AND FOE

Summary :

- Microorganisms can be divided into five categories: bacteria, protozoa, fungi, algae and viruses.
- Uses of microorganisms can be divided into commercial, medicinal, agricultural and environmental.
- Some of the commercial uses include making bread, making curd and cheese, making alcohol beverages, production of vinegar, toothpaste and pickles.
- Some of the medicinal uses include making antibiotics, vaccines, food supplements etc.
- Harmful microorganisms can be broadly classified as : disease causing microbes and food spoiling microbes.
- Some of the communicable diseases in humans are malaria, cholera, typhoid etc.
- Diseases caused by pathogens in animals are foot and mouth disease, anthrax and rinderpest.
- Microbes often produce toxic substances which make the food unfit for consumption and may cause serious illness due to food poisoning.
- Common methods used for preserving food are boiling, dehydration, canning, refrigeration and freezing.
- Nitrogen is cycled between the atmosphere, soil and organisms.

Multiple Choice Questions (Page No. 29)

1. (a) 2. (c) 3. (b) 4. (d) 5. (b)

Multiple Choice Questions (Page No. 33)

1. (c) 2. (d) 3. (a) 4. (c) 5. (a)

SECTION - A

Oral Questions:

Q1.- What is meant by food poisoning?

Ans.- The toxic substances which are produced by microorganisms, make the food poisonous and cause serious illness. This is called food poisoning.

Q2. – Name two diseases caused by virus in humans.

Ans. - Polio, influenza, common cold, dengue, chickenpox, measles, smallpox.

Q3. – Name a unicellular alga.

Ans. - Chlorella.

Science Quiz:

Q1. – Name the virus which uses bacteria as host.

Ans. - Bacteriophage.

Q2. – Name the antibiotic and its source discovered by Alexander Fleming.

Ans. - Penicillin, Penicillium notatum.

Q3. – Name a communicable disease transmitted through air.

Ans. - Tuberculosis/common cold/pneumonia.

Worksheet

Tick the correct options :

1. (d) 2. (a) 3. (c) 4. (b)

Fill in the blanks :

1. Immunity 2. Nitrogenous compounds

3. Salmonella 4. Preservative

State whether the following statements are True (T) or False (F) :

1. F 2. T 3. T 4. T

SECTION – B

Multiple Choice Questions :

1. (b) 2. (c) 3. (a)

Very Short Answer Questions:

Q1.- Name any two antibiotics.

Ans.- Streptomycin, tetracycline, chloromycetin.

Q2.- Name any two communicable diseases.

Ans.- Common cold, chickenpox, tuberculosis.

Q3.- Name two common food preservatives used at our homes.

Ans.- Salt, sugar .

Q4.- Name two diseases that spread through air.

Ans.- Common cold, tuberculosis, pneumonia.

Q5.- What is immunity?

Ans.- The ability of one's body to resist a disease is called immunity.

Short Answer Type-I Questions:

Q1.- What is pasteurization?

Ans.- Pasteurisation is a process for preservation of milk. In this process, milk is heated at about 70 °C for 15 to 30 seconds to kill the bacteria present in it and then cooling it quickly to 10 °C to prevent the remaining bacteria from growing.

Q2.- How do viruses differ from other microorganism?

Ans.- Viruses are different from other organisms because: They have the characteristics of both living and non-living things. Viruses are acellular, i.e., they do not have any of the substances present in a cell. They only contain a small nuclear material wrapped in a protein coat. They cannot grow and reproduce on their own. This indicates that they are non-living. When they enter a living cell, they reproduce using the energy of the living cell. Thus, they are said to be a connecting link between living and non-living things.

Q3.- What is meant by fermentation? Name the scientist who discovered it.

Ans.- The process of breakdown of sugar into alcohol and carbon dioxide by the action of microbes like yeast is called fermentation. Louis Pasteur discovered the process of fermentation.

Short Answer Type-II Questions

Q1.- Explain the formation of curd from milk.

Ans.- Lactobacillus bacteria help to make curd from milk. Curd is formed when a protein called casein, present in milk, clumps together to form a solidified mass.

Casein coagulation takes place only when the milk is acidic. A spoonful of curd contains bacteria *Lactobacillus* which promote the formation of curd from milk. *Lactobacillus* multiplies using the non-fat components of milk to produce acidic product Casein coagulates in acidic milk

Milk + Curd → Milk becomes acidic → Formation of curd

Q2.- How do leguminous plants increase soil fertility?

Ans.- Leguminous plants contain *Rhizobium* bacteria in their root nodules which absorb nitrogen from the atmosphere and convert it into nitrates. When roots are decomposed, these nitrates mix with the soil and increase the soil fertility.

Q3.- Name any two diseases caused by (a) virus (b) bacteria (c) protozoa.

Ans.- (a) Common cold, influenza, mumps, measles, chickenpox, small pox

(b) Typhoid, Cholera, tuberculosis, anthrax, tetanus

(c) Malaria, sleeping sickness, amoebic dysentery

Q4.- Microorganism decompose dead organic waste of plants and animals and helping keeping the environment clean.

(a) Name any two microorganisms which keep the environment clean by decomposing dead organic waste.

(b) Being a student, how can you contribute in keeping the environment clean? Give two ways.

Ans.- (a) Bacteria and fungi

(b) (i) By walking and cycling to near distances and reducing the use of fossil fuels.

(ii) By planting more and more trees.

Long Answer Questions:

Q1.- Explain two methods of food preservation. Also, discuss the advantages of food preservation.

Ans.- (i) Preservation by common salt: For ages, people have preserved fish and meat by salting. Meat and fish are covered with dry common salt. Salting draws out water (moisture) from the food thus, prevents microbial growth and reproduction. Salting is also used to preserve amla, raw mangoes, tamarind, etc.

(ii) Chemical method: Food can be preserved by using certain chemical substances which can check the growth of microorganisms. Such chemical substances are called food preservatives. Most chemical preservatives remove oxygen from the food items. This helps in preventing microbial growth. Sodium benzoate, citric acid potassium metabisulphite are common food preservatives.

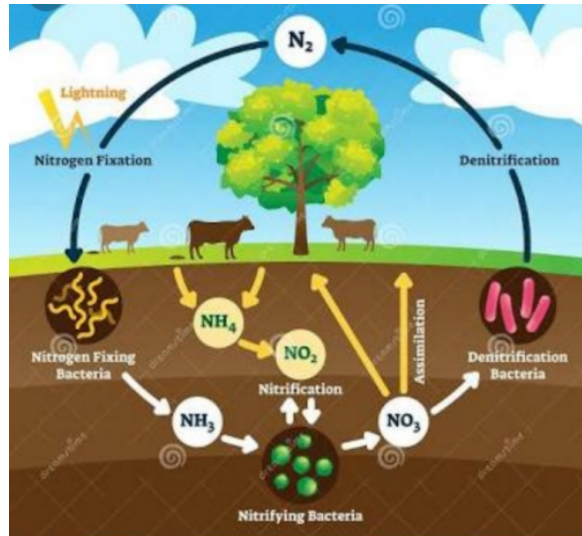
Advantages of food preservation are:

- i) It decreases wastage of food by avoiding spoilage.
- ii) It increases the storage period of food materials.
- iii) Nutritional value of the food is retained for a longer period.
- iv) It ensures the food availability at distant places and during the off season.

Q2.- Draw a neat diagram to show nitrogen cycle and explain the process of nitrification and denitrification.

Ans.- Nitrification: Ammonium salt in the soil is converted first into nitrites by Nitrosomonas bacteria. The nitrites are then converted into nitrates by Nitrobacter bacteria. The nitrates, so formed in the soil, can once again be absorbed by the plants. This process is called nitrification.

Denitrification: Some of the nitrates are absorbed by plants. Rest of the nitrates in the soil are converted by Pseudomonas bacteria into nitrogen gas which escapes into the atmosphere. The conversion of nitrates into free nitrogen gas by denitrifying bacteria is called denitrification.



Q3.- Describe the principle on which the following methods of food preservation are based :

(a) boiling (b) canning (c) freezing (d) dehydration.

Ans.- (a) Boiling - Heating effect

(b) Canning - Air-free packing/vacuum packing

(c) Freezing - Low temperature treatment

(d) Dehydration - Removal of moisture

Q4.- (a) What is vaccine? (b) How does it work?

(c) Why are children vaccinated?

Ans.- (a) A small dose of dead and weakened disease-causing microbes used to stimulate immune response in the body is called vaccine.

(b) When a vaccine is introduced in the body of a healthy person, it acts like an antigen. The body of the person produces antibodies against these introduced microbes. These antibodies remain in the body and protect the person against any future infections of the same microbe.

(c) The children are vaccinated to protect them from several diseases.