

# Microorganisms Friend and Foe

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## Check point 1

**Q. 1. Give two examples of microbes.**

**Answer:** Bacteria and protozoa are two examples of microbes.

Both bacteria and protozoa are very small which can be visible through a microscope so they are called microbes.

**Q. 2. Name the microorganisms that can make their own food by photosynthesis.**

**Answer:** Algae are microbes that can make their own food by photosynthesis.

They have chlorophyll which can trap sunlight energy to prepare food.

**Q. 3. Name the four types of bacteria on the basis of shape.**

**Answer:** On the basis of shape bacteria are of four types are:

1. Bacillus is rod-shaped
2. Coccus is spherical shaped
3. Spirillum is spiral-shaped
4. vibrio is comma-shaped.

**Q. 4. Who is closer to animals; algae or Protozoa? In what aspect?**

**Answer:** Protozoa is closer to animals as it has some animal-like characters, it can move from place to place, it has no cell wall.

## Check point 2

**Q. 1. Some of the microbes that live inside the bodies of animals help them. Give an example.**

**Answer:** Some microbes that remain in our gut help in digestion. E.coli bacteria is found in intestine of animals that helps in digestion of food.

**Q. 2. Give reason as to why curd is added to idlis and bhaturas.**

**Answer:** Curd contains Lactobacillus bacterium which makes idlis and bhaturas soft and spongy.

**Q. 3. What is the main reason behind the rise to dough when yeast is added to it?**

**Answer:** The yeast rapidly reacts with sugar in the dough and reproduce and produces carbon dioxide during respiration.

The bubbles of the gas fill the dough and increase its volume.

This the main reason behind the rise of dough when yeast is added to it.

**Q. 4. Who discovered the first antibiotic? Name the antibiotic.**

**Answer:** Alexander Fleming discovered the first antibiotic. The first antibiotic is Penicillin from fungus *Penicillium notatum* discovered in 1929.

**Q. 5. A vaccine provides immunity. How?**

**Answer:** A vaccine consists of dead or weakened microbes which produce suitable antibodies when introduced into a healthy body. These antibodies remain inside our body and protect from disease-causing microbes thus provides immunity.

### **Check point 3**

**Q. 1. A female Aedes mosquito is a carrier of a particular disease. name the disease.**

**Answer:** Female Aedes mosquito is the carrier of dengue disease.

**Q. 2. An insect can also carry disease with it. yes or no? Give reason.**

**Answer:** Yes, an insect can carry disease with it.

For example- insects like the housefly, the housefly sit on the garbage and animal excreta. Pathogens stick to their bodies. When the flies sit on uncovered food they may transfer the pathogens stick on uncovered food they may transfer the pathogen. Whosoever eats the contaminated food is likely to get sick.

**Q. 3. Viruses can infect humans as well as plants and animals. Give example.**

**Answer:** Swine flu virus will affect pigs. Similarly, bird flu virus affects birds. Some virus causes disease in plants. In humans, viral diseases are flu, chicken pox, AIDS and many more. Varicella virus causes chicken pox, HIV causes AIDS etc. Because a virus needs a host to multiply, so it can be plant, animal or human.

### **Check point 4**

**Q. 1. The milk that comes in packets does not get spoiled. Give reason.**

**Answer:** The milk in packets is pasteurised so it does not get spoiled.

In pasteurization, process milk is heated up to 70°C for 15-30 seconds and then cooled quickly to a very low temperature which kills the microbes so prevent it from getting spoiled.

This process was discovered by Louis Pasteur.

**Q. 2. Give the best way to preserve items like meat for longer periods.**

**Answer:** Common salt is used to preserve meat for longer periods as it removes water from body of microbes thus killing them and protect the meat from getting spoiled for longer periods.

**Q. 3. A chemical is added to pickles to check their spoilage. Name it.**

**Answer:** Sodium benzoate and sodium metabisulphite are common preservatives added to pickles to check the growth of microbes and prevent them from spoilage.

**Q. 4. Name an element present in atmosphere that is essential for living organisms.**

**Answer:** Nitrogen is an element present in atmosphere that is essential for living organisms.

It is an important constituent of proteins, chlorophyll, nucleic acids, vitamins etc.

**Q. 5. A type of plants can fix nitrogen gas of air into compounds of nitrogen. Give its name.**

**Answer:** Leguminous plants can fix nitrogen gas of air into compounds of nitrogen.

Rhizobium bacterium is present in root nodules of these plants which help in nitrogen fixation. They convert atmospheric nitrogen into nitrites and nitrates.

### **Chapter Test**

**Q. 1. Is the decomposition of the bodies of dead plants and animals by microorganisms desirable?**

**Answer:** Yes, the decomposition of the bodies of dead plants and animals by microorganisms is desirable because if they would not be decomposed by microbes they would remain as such in the environment occupying lots of space and causing pollution. Thus microbes decompose them into simpler substances and help in cleaning the environment.

**Q. 2. Explain fixation of nitrogen.**

**Answer:** The process of conversion of atmospheric nitrogen into nitrogenous compounds is called nitrogen fixation.

Nitrogen-fixing bacteria can convert atmospheric nitrogen into nitrogenous compounds. Nitrogen fixation also occurs through lightning.

**Q. 3. Give one important use of algae.**

**Answer:** Algae like Spirulina are a good source of proteins. They are also used in wastewater treatment plant.

**Q. 4. A microorganism is used in baking industry. Name it.**

**Answer:** Yeast is used in baking industry. They rapidly produce carbon dioxide gas by a fermentation process in dough used to prepare bread, cakes thus making it soft and increasing the volume of dough.

**Q. 5. The parasite of malaria and dengue spread by which insects?**

**Answer:** Mosquitoes spread the parasites of malaria and dengue.

Aedes mosquito spread dengue fever and female Anopheles mosquito spread malaria.

**Q. 6. Yeast used to prepare food items. Name them.**

**Answer:** Yeast is used in preparing bread, pastries, cakes, wine. As yeast helps in fermentation process so it is widely used in baking and alcohol industry.

**Q. 7. Write about Louis Pasteur.**

**Answer: Louis Pasteur:** He was a French microbiologist born in 1822. He discovered pasteurization, fermentation process, the principle of vaccination etc. He found Germ theory of disease along with Robert Koch. He is regarded as father of microbiology. He discovered vaccine for rabies and anthrax. He shows that many microbes spoil beverages like alcohol, beer, milk etc. So he invented a process called pasteurization where liquids like milk are heated to 60-100°C where most microbes get killed and then cooled suddenly. This process prevents the spoilage of liquids like alcohol, milk etc. He founded an institute which bears his name. He has worked a lot on sericulture too.

**Q. 8. Name a disease caused by bacteria.**

**Answer:** A disease caused by bacteria is Anthrax. Bacillus anthracis is the causative agent.

**Q. 9. Rohit saw his mother adding a little curd to warm milk to set curd for next day. Why does she do?**

**Answer:** Curd contains Lactobacillus bacterium which promotes the formation of curd from milk. So Rohit's mother adds little curd to warm milk so that bacteria will multiply in milk and convert into curd next day.

**Q. 10. Does salt prevent food spoilage? How?**

**Answer:** Yes, salt prevent food spoilage because it makes the medium hypertonic so water from cells of microbes will come out causing plasmolysis and prevent growth of microbes. Thus food is prevented from spoilage.

**Q. 11. It is advised to wash hands before handling food. Give reasons.**

**Answer:** Our hands are full of microbes so if we eat or serve or cook food without washing our hands, food will get contaminated and if we consume those foods we will suffer from several diseases. So we should wash our hands properly with water and soap before handling foods.

**Q. 12. Microorganisms are an essential part of our life. Justify the statement.**

**Answer:** There are various microbes which are beneficial to us. Decomposers like bacteria, fungi act upon dead organisms and convert into simpler forms, thus help in cleaning our environment. Some antibiotics are manufactured from certain microbes. They are used in baking and alcohol industry. Some microbes like cyanobacteria, rhizobium helps in nitrogen fixation thus increasing the fertility of the soil. Some microbes are used in leather, food processing industry. Some are used in the manufacture of enzymes, hormones etc.

So microbes are an essential part of our life.

**Q. 13. Write the importance of nitrogen-fixing bacteria in soil.**

**Answer:** Certain nitrogen-fixing bacteria present in the soil like Azotobacter and Clostridium convert atmospheric free nitrogen into nitrogenous compounds like nitrites and nitrates thus enriching the soil with nitrogen and increasing fertility of the soil.

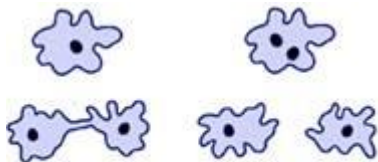
**Q. 14. How do algae differ from fungi?**

**Answer:** Algae have chlorophyll so they can photosynthesize. They are autotrophs. But fungi do not have chlorophyll, they cannot photosynthesize. They are heterotrophs.

Algae are simple, plant-like organisms without roots, stem, and leaves. Fungi body is made up of hyphae or mycelium.

**Q. 15. Explain the process of binary fission.**

**Answer:** Binary fission is an asexual mode of reproduction.



The genetic material first duplicates through mitosis leading to duplication of the nucleus through karyokinesis and a constriction appears in the cell membrane which deepens and finally, a single parent cell divides into two daughter cells. The division of the cytoplasm is called cytokinesis. This mode of asexual reproduction is called binary fission.

**Q. 16. Elucidate the use of fungi and their harmful effects.**

**Answer:** Fungi, like yeast is used in baking industry, alcohol industry as they help in fermentation process thus helps in the production of wine, alcohol, bread, pastries, cakes etc. Some antibiotics are also obtained from fungi like penicillin.

Some fungi cause diseases in plants, animals, and human beings.

**Q. 17. Comment**

**(a) Curd turns sour faster in summer.**

**(b) Viruses are neither living nor non-living.**

**Answer: a.** In summer, the temperature is optimum for the growth of Lactobacillus bacterium which converts milk into curd than in winter. So these bacteria multiply very fast causing milk to turn into curd rapidly and produce more lactic acid making curd sour faster.

**b.** Virus show characteristics of both living and non-living. When they are outside the body of the host they behave like non-living. But once they enter into a body of host whether plant, animal or bacteria, they start multiplying and behave like living beings. So viruses are neither living nor non-living.

**Q. 18. Write the role of immunization in eradicating diseases from a country.**

**Answer:** Immunisation play an important role in eradicating diseases from our country. Vaccines are the preparation of weak or dead microbes when are introduced into a healthy human produce suitable antibody. These antibodies remain in our body and develop immunity thus protecting us from several diseases.

The process of introduction of vaccines into our body is called immunization. This process helps us to protect from several diseases like typhoid, TB, polio, tetanus, rabies, measles, diphtheria etc.

**Q. 19. Why should we not let water collect in coolers?**

**Answer:** Water serves as a good breeding place for mosquitoes which are carriers of various pathogens and can transmit them into our body causing various diseases like malaria, dengue, filaria etc. So, we should not allow water to collect in coolers.

**Q. 20. Write the different methods of food preservation.**

**Answer:** Different methods of food preservation are-

**1. Storage and Packing:** where water is removed from foodstuff preventing the growth of microbes. Examples- vegetables, dry fruits, pulses, spices etc.

**2. Preservation by chemicals-** Sodium benzoate, sodium metabisulphite etc. are used as preservatives to store pickles, jam, squashes etc. They prevent the attack of the microbes.

**3. Preservation by Common Salt-** Adding of common salt helps to preserve meat, fish for ages.

**4. Preservation by sugar-** sugar is added to jam, jellies, squashes which reduces the moisture content which inhibits the growth of bacteria which spoil food.

**5. Preservation of oil and vinegar-** Use of oil and vinegar prevents spoilage of pickles because bacteria cannot live in such an environment. Vegetables, fruits, fish and meat are often preserved by this method.

**6. Pasteurization-** Pasteurization is a process in which the liquid substance is heated to a temperature of 70°C for 15 to 30 Seconds and then suddenly chilled and stored. It is used to preserve wine, milk etc.

**7. Irradiation-** High energy gamma rays or X-rays are used to preserve foods.

**8. Vacuum drying-** Milk is converted into milk powder by this process where moisture is removed.

**9. Proper storage and packing-** dry fruits, vegetables are properly stored and sealed in air-tight packets.

**10. Hot and cold treatment-** We can boil food and store or we can refrigerate foods at very low temperature. Because microbes die at very high or low temperature.