

BIOLOGY • CLASS 12

8

CHAPTER

Microbes in Human Welfare

NCERT SOLUTIONS



EXERCISE SOLUTIONS: QUESTIONS 1 & 2

1. Which household sample would you carry to a biology laboratory to demonstrate microbes under a microscope, and why?

Answer:

I would carry a small sample of fresh curd. It contains large numbers of lactic acid bacteria, including Lactobacillus, which can be observed with a suitable microscope.

2. Give examples showing that microbes release gases during metabolism.

Answer:

- Yeast releases carbon dioxide during fermentation. Gas trapped in bread dough makes it rise. CO_2
- Bacteria release carbon dioxide during Swiss cheese production; the gas forms the characteristic holes. CO_2
- Methanogens such as Methanobacterium release methane during anaerobic breakdown of organic waste; this is a major part of biogas. CH_4

EXERCISE SOLUTIONS: QUESTIONS 3 & 4

3. In which food are lactic acid bacteria found? Mention their useful applications.

Answer: They are found in curd and other fermented milk products.

- They produce lactic acid, which coagulates milk proteins and helps convert milk into curd.
- They partially digest milk proteins and improve digestibility and nutritional quality.
- Beneficial strains help check the growth of some disease-causing microbes in the digestive tract.

4. Name traditional Indian foods made from wheat, rice and Bengal gram that involve microbes.

Answer:

Raw material	Fermented food examples
Wheat flour	Bhatura, naan and jalebi made from fermented dough or batter
Rice with black gram	Idli and dosa
Bengal gram, often with rice	Traditional fermented dhokla

These examples refer to fermented versions, not instant versions raised only with baking powder.

EXERCISE SOLUTIONS: QUESTIONS 5 & 6

5. How have microbes helped control diseases caused by harmful bacteria?

Answer:

- Some microbes produce antibiotics that kill susceptible bacteria or stop their growth.
- Penicillin, discovered by Alexander Fleming, is an important example. Chain and Florey developed its use as an effective medicine.
- Antibiotics have greatly reduced illness and deaths from many bacterial infections. They do not treat viral infections.

6. Name two fungal species used in antibiotic production.

Answer:

Fungus	Antibiotic
<u>Penicillium notatum</u> (historical textbook name)	Penicillin
<u>Acremonium chrysogenum</u>	Cephalosporin C

EXERCISE SOLUTIONS: QUESTIONS 7 & 8

7. What is sewage, and how can it be harmful?

Answer: Sewage is municipal wastewater containing human excreta, organic wastes, suspended matter and microbes.

Untreated sewage may spread water-borne diseases. Its organic matter raises oxygen demand, lowering dissolved oxygen and harming aquatic life.

8. What is the key difference between primary and secondary sewage treatment?

Answer:

Primary treatment	Secondary treatment
Mainly physical removal	Mainly biological removal
Screening, filtration and sedimentation	Microbial breakdown, followed by settling
Removes floating and suspended solids	Removes much of the biodegradable organic matter
Produces primary sludge and effluent	Produces activated sludge and effluent with lower BOD

In aeration tanks, aerobic microbes form flocs and consume organic matter. Settled flocs form activated sludge.



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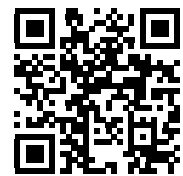


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