



Q: What is fermentation?

Fermentation

"Fermentation is an anaerobic respiration that breaks down sugar (like glucose etc.) to produce energy."



Term anaerobic

Fermentation is an anaerobic process which means it occurs in the absence of oxygen/air.

Short question

What are the products of fermentation?

Which organism are used to carry out fermentation?



Products of fermentation:

Fermentation has been used for thousands of years to produce:





Organisms:

Fermentation is carried out by microorganism such as:

- Yeast
- Certain fungi and bacteria
- Enzymes produced by other organisms.

Organisms involved in fermentation

Saccharomyces

Streptococcus

Escherichia coli

Clostridium





Types of fermentation

There are two types of fermentation:

- ✤ Alcoholic fermentation
- ✤ Lactic acid fermentation



Short question

How bread is formed through fermentation?

In bread making, the flour used contains starch, protein and an enzyme amylase. Yeast is added in the flour. The flour is mixed with water to form dough. The carbon dioxide produced causes the dough to rise and because of this cavities appear.

Short question

What are the products of alcoholic fermentation?

Alcoholic fermentation:

It is anaerobic transformation of sugars into ethanol and carbon dioxide.

- It is carried out by yeast.
- It is used to manufacture bread and in baking processes.

Chemical reaction:

 $C_6H_{12}O_6 \longrightarrow 2 C_2H_5OH (Ethanol) + 2 CO_2$



Short question

Why are cavities formed in dough?

Ans: During dough formation, carbon dioxide is produced which causes the dough to rise and because of this cavities appear.





Lactic acid fermentation:

It is anaerobic transformation of sugars into lactic acid.

- ✤ It is carried out by fungi and bacteria.
- It is used in dairy industry to make cheese and yoghurt.

Short question

Define lactic acid fermentation. What are products of fermentation?



Chemical reaction:

 $C_6H_{12}O_6$

2 C₃H₆O₃ (Lactic acid)







Multiple choice questions

| 1. In bread making, the flour used contains: | | | | | | | |
|--|----------------|------------------|-----------------|------------------|--|--|--|
| a. | Glucose | b. Lipid | c. Oxygen | d. Starch | | | |
| Explanation: Flour used in bread making primarily contains starch, which is a carbohydrate. | | | | | | | |
| The starch is broken down by enzymes during the bread-making process. | | | | | | | |
| 2. Fermentation takes place without the help of: | | | | | | | |
| a. | Oxygen | b. Nitrogen | c. Hydrogen | d. Helium | | | |
| Explanation: Fermentation is an anaerobic process, meaning it occurs without oxygen. | | | | | | | |
| 3. Anaerobic form of respiration is called: | | | | | | | |
| a. | Photosynthesis | b. Mitosis | c. Fermentation | d. Respiration | | | |
| Explanation: Fermentation is an anaerobic process of respiration where glucose is converted | | | | | | | |
| into energy, carbon dioxide, and other byproducts in the absence of oxygen. | | | | | | | |
| 4. Cavities are formed in dough due to: | | | | | | | |
| a. | Oxygen | b. Hydrogen | c. Sulphur | d. Carbon | | | |
| | | | dioxide | dioxide | | | |
| Explanation: Cavities or bubbles in dough are formed due to the production of carbon | | | | | | | |
| dioxide gas by yeast during fermentation. | | | | | | | |
| 5. Fermentation is carried out by: | | | | | | | |
| a. | Air | b. Microorganism | c. Heat | d. None of these | | | |



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|--|----------------------|-------------------------|-----------------------|-----------------|--|--|--|
| Explanation: Fermentation is carried out by microorganisms such as yeast and bacteria, | | | | | | | |
| which convert sugars into alcohol or acids. | | | | | | | |
| 6. | Fermentation is a | process | • | | | | |
| a. | Endothermic | b. Exothermic | c. Anabolic | d. Catabolic | | | |
| Explanation: Fermentation is an exothermic process, releasing energy in the form of heat as | | | | | | | |
| microorganisms break down sugars. | | | | | | | |
| 7. What is the end product of lactic acid fermentation? | | | | | | | |
| a. | Ethanol | b. Carbon dioxide | c. Lactic acid | d. Acetic acid | | | |
| Explanation: Lactic acid is the main product of lactic acid fermentation, which occurs in | | | | | | | |
| muscles during intense exercise and in some bacteria used in food production. | | | | | | | |
| 8. Which component in the fermentation process is directly responsible for the tangy flavor in yogurt? | | | | | | | |
| a. | Carbon dioxide | b. Ethanol | c. Lactic acid | d. Glucose | | | |
| Explanation: Lactic acid is the compound that gives yogurt its tangy flavor. It is produced by | | | | | | | |
| lactic | acid bacteria during | the fermentation proces | s of milk. | | | | |
| 9. Which process is used in dairy industry for making cheese ad yogurt? | | | | | | | |
| a. | Fermentation | b. Pasteurization | c. Filtration | d. Distillation | | | |
| Explanation: Fermentation is the process used to make cheese and yogurt. | | | | | | | |
| 10. Microorganisms are used in making: | | | | | | | |
| a. | Yogurt | b. Bread | c. Cheese | d. All of these | | | |
| Explanation: Microorganisms are crucial in the production of yogurt, bread, and cheese. | | | | | | | |



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11. Lactic acid fermentation is carried out by:

- a. Algae
- b. Bacteria

c. Fungi

d. Fungi and

bacteria

Explanation: Lactic acid fermentation is carried out by fungi and bacteria