

## Fermentation

The term “fermentation” was first used by Pasteur to define respiration in the absence of free molecular oxygen. Fermentation can be **broadly** defined as respiration that occurs in the dark (no photosynthesis) and does not involve the use of free molecular oxygen, nitrate ions, or nitrite ions as the final electron acceptors of degraded organic compounds. Therefore, respiration may occur **through** several fermentative pathways including sulfate reduction, mixed acid production, and methane production. Fermentation is a form of anaerobic respiration. The bacteria that **perform** fermentation are facultative anaerobes and anaerobes. Fermentation involves the transformation of organic compounds to various inorganic and organic products. During fermentation a portion of an organic compound may be oxidized while another portion is reduced. It is from this oxidation-reduction of organic compounds that fermenting bacteria obtain their energy and produce numerous simplistic and soluble organic compounds. Fermentative bacteria are capable of performing a variety of oxidation-reduction reactions involving organic compounds, carbon dioxide, carbon monoxide (CO), molecular hydrogen, and sulfur compounds. Fermentative bacteria include facultative anaerobes, aerotolerant anaerobes, and strict anaerobes. Some fermentative bacteria such as the clostridia and *Escherichia coli* produce a large variety of products, whereas other fermentative bacteria such as *Acetobacterium* produce a very small number of products. As environmental or operational conditions change, for example, pH and temperature, the bacteria that are active and inactive also change. These changes in activity are responsible for changes in the types and quantities of compounds that are produced through fermentation.

**Questions:**

1) Translate what follow into French

The term “fermentation” was first used by Pasteur to define respiration in the absence of free molecular oxygen.

-----

2) Fill in each gap with the appropriate word from the list given.

Fermentative, microorganisms, modern, Louis Pasteur, fermentation

-----discussed the issue of fermentation. He obviously suspected and, in some cases, he knew that----- processes are diverse and complicated. Indeed, although ----- science recognizes more than one type of fermentation, a general definition should define ----- as a biochemical process through which most -----  
-----decompose carbohydrates to produce energy under anaerobic conditions.

3) Reorder the following sentences to get a coherent paragraph.

a- Therefore, today, when one considers fermented foods, it is not surprising that the focus is on foods in which microbial activity plays an essential role in obtaining the required stability, safety and sensory properties

b- Fermentation is a biotechnology that promotes and controls the growth of microorganisms and their metabolic activities for the preservation and transformation of raw food materials.

c- However, when the discussion comes to the virtues of fermentation as a preservative, it is almost always related to those foods where lactic acid bacteria (LAB) play a central role in the production process

d- This discussion excludes those products that are often described as fermented but are largely the product of non microbial, enzymatic processes, such as black tea and Southeast Asian fish sauces.

4) Find what or who the underlined words in the text refer to.

5) Put the verbs between brackets into the correct form.

During food fermentation, metabolites **(to produce)** by the desirable fermenting organisms, such as lactic acid, acetic acid, carbon dioxide, ethanol, hydrogen peroxide, bacteriocins and antimicrobial peptides.

There **(to be)** two types of fermentation: Natural fermentation and controlled fermentation with starter cultures.

Aspergillus **(to be)** a phenotypically polythetic genus and **(to be)** widely distributed in the environment.

Probiotics and prebiotics **(to be)** now widely used in both medical and dental specialties.

Resistance to antibiotics (AR) **(to be)** globally recognized as an emerging serious threat to human health and as a food safety problem.