




# Fermentation

When oxygen is not present, glycolysis is followed by a different pathway, this alternative pathway is called fermentation.

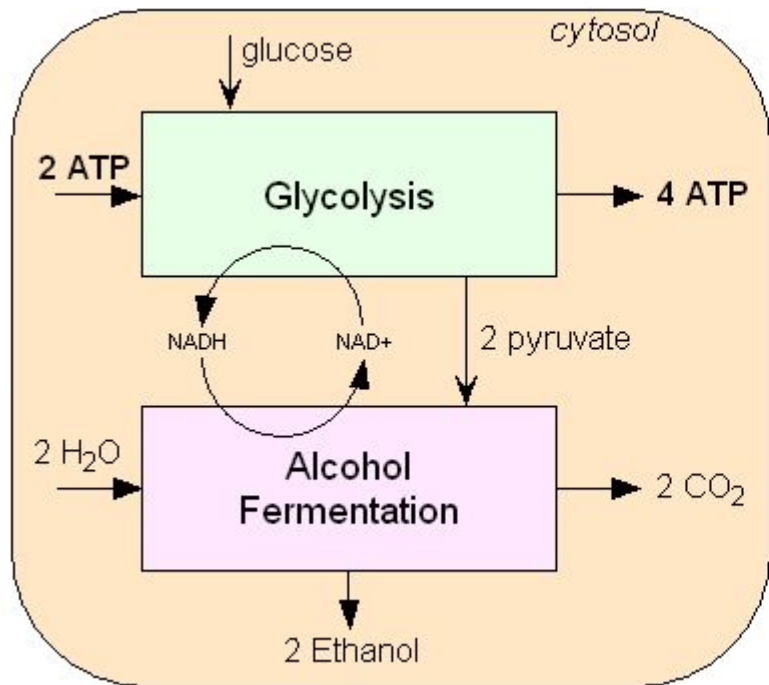
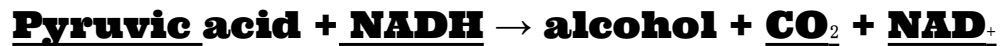
Fermentation releases energy from food molecules by producing ATP in the absence of oxygen

Because it does not require oxygen it is called anaerobic, meaning “not in air”

Fermentation	
inputs	outputs
glucose  ADP + 	2 lactate or 2 alcohol and 2 CO <sub>2</sub>  <b>net</b>

There are two main types of fermentation:

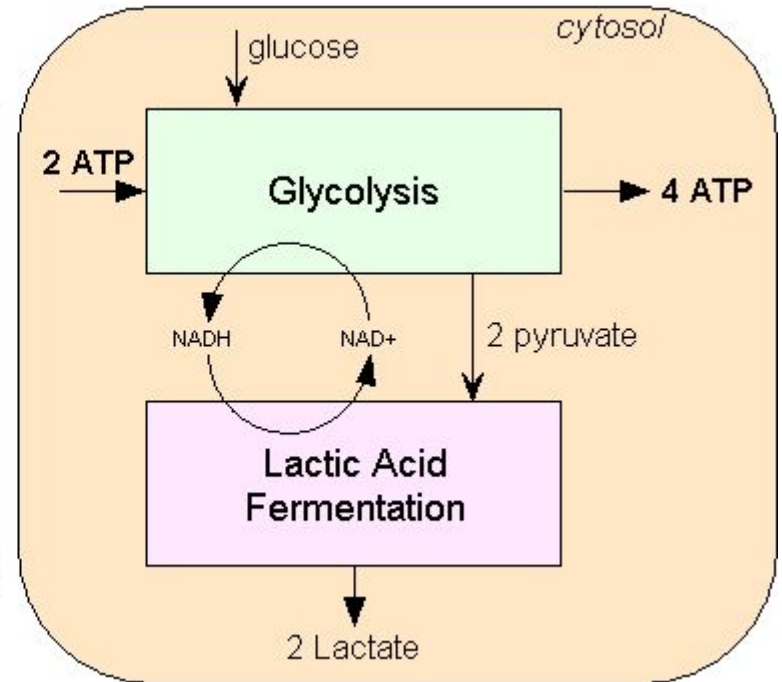
Alcoholic fermentation-- produces ethanol (alcohol) and carbon dioxide



**Lactic Acid Fermentation**-- pyruvic acid accumulated in cells can be converted into lactic acid when NAD<sup>+</sup> is regenerated for glycolysis to continue if there is not enough oxygen present.

**Pyruvic acid + NADH → lactic acid + NAD<sup>+</sup>**

Lactic acid can be produced in your muscles during rapid exercise because you quickly run out of oxygen in your body, this causes a burning sensation and can make your muscles feel sore!



Unicellular organisms also produce lactic acid as a waste product during fermentation.

