Ethanol fermentation

Ethanol fermentation is a process that some microbes – mostly yeasts, but also some types of bacteria – use to obtain energy from sugars.

Biochemistry of ethanol fermentation performed by the brewer’s yeast, Saccharomyces cerevisiae:

The fermentation process produces pyruvic acid, which is then converted into carbon dioxide and ethanol. Ethanol is a form of alcohol, so the process can also be called alcoholic fermentation.

It is thanks to ethanol fermentation that we have delicious foods and drinks like bread, beer and wine.

More recently it has also been harnessed to produce biofuels in an effort to find alternative sources of energy to replace oil.

Bread is one of the oldest prepared foods, dating back to Neolithic times – 10,000 years ago!

Breads like sourdough can be made with wild yeasts.

Breaking bread together is a universal sign of peace.

Tradition has it that whoever eats the last piece of bread has to kiss the cook!
To make bread, we mix together flour, water and a live culture of yeast.

The yeast will use ethanol fermentation to obtain energy from the sugars in the flour.

Ethanol fermentation

The yeast breaks down the starch into glucose, which it can then feed on.

Eating the glucose gives the yeast the energy it needs to live, and produces alcohol and carbon dioxide as waste.

Without yeast, there can be no fermentation, and without that, there can be no release of gas, no air pockets... so bread made without yeast is all flat!

You can use baking soda instead, because it causes a chemical reaction that produces carbon dioxide gas, but the taste of the bread is very different.

Flour is composed mostly of starch, which is in turn composed of molecules of glucose, a simple sugar, assembled into long branching chains.

Kneading the dough ensures that the ingredients are well mixed, so it can rise properly.

Oops!

The air pockets that make bread light and fluffy are formed by the carbon dioxide gas expelled by the yeast during fermentation.

Baking

Baking kills the yeast and sets the air pockets. It also evaporates the alcohol that was produced during fermentation.

Fresh from the oven or toasted, white or whole grain, plain or with jam, it’s... BREAD!