

Does yeast need air to make bread rise essays examples

[Environment](#), [Water](#)



Introduction Yeast is a single-celled organism and is a type of fungi. Yeast has been used for centuries as the driving force behind the process of fermentation, which enables dough to rise into a loaf of bread. To make a loaf rise, yeast converts sugar ($C_6H_{12}O_6$) and oxygen from the air (O_2) into carbon dioxide (CO_2) and water (H_2O). When no oxygen is available, yeast will switch to an alternative pathway that does not need oxygen. Yeast metabolizes sugar ($C_6H_{12}O_6$) to make carbon dioxide gas (CO_2) and ethanol (C_2H_5OH) as end products. This carbon dioxide gas produced from yeast fermentation is responsible for the airy texture of bread, as the carbon dioxide gets trapped in the dough and creates little pockets or bubbles of air. Meanwhile, the alcohol created by fermentation is burned off during baking, and provides additional flavor to the bread. Gluten, a protein found in wheat flour, gives dough its elasticity and enables bread to capture the bubbles of carbon dioxide that are produced by yeast.

Hypothesis The hypothesis is that yeast does not absolutely require air to make bread rise. If yeast is added to bread dough under anaerobic conditions, the dough will still rise.

Controlled Experimental Method To determine whether or not yeast needs air in order for bread to rise, anaerobic conditions must be set up and an experiment performed under these controlled conditions. One way of doing this would be to use a plastic drink bottle that is filled with warm water. A few tablespoons of sugar can be dissolved in the water, and a packet of baker's yeast should be added. The bottle should be filled to the top with water, and a deflated balloon should be tightly fastened over the neck of the bottle. A second bottle, with sugar but no yeast added, should also be

included as a negative control. This will ensure that any results obtained in the test group are due to the presence of yeast, which is the variable being tested in this experiment. Three replicate test and control bottles can be set up in this fashion to demonstrate that the results obtained are reproducible. The increase in size of the balloons can then be measured by their change in circumference over a period of time, as the fermentation reaction takes place.

An alternative to this experiment would be to combine yeast, sugar and water into a sealable plastic bag. All of the air should be pushed out of the bag prior to beginning the experiment. A negative control bag, which has water and sugar but no yeast, should also be included. Several replicate test and control bags should be used to ensure that the results obtained are reproducible. Air bubbles that form in the top of the bag can be measured with a ruler. Results

The expected results would be that bubbles of CO₂ gas would be produced in the form of air bubbles in the test samples containing yeast, but not in the control samples which contain no yeast. For example, if balloon width or air bubble size in the plastic bag were being measured over time, a table could be generated.

ConclusionBased on the results of this experiment, I accept the hypothesis that yeast does not require air to make bread rise. The experiment was performed under anaerobic conditions and demonstrated that CO₂ gas was still being generated, indicating that yeast can ferment in the absence of any air.

References

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