CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
34054

Project Title
How Much CO(2) Does Yeast Make Using Different Carbohydrates?

Abstract

Objectives/Goals
With all other growth conditions remaining the same, if I change a yeast's carbohydrate source, I expect to see more or less CO2 depending on how well the yeast use that carbohydrate source.

Methods/Materials
I divided a liquid culture of Champagne yeast into smaller bottles and added different carbohydrate sources to the different bottles. I capped the bottles with balloons to catch the CO2 made. I also added enzymes to some of the carbohydrate sources to help break them down for the yeast. I measured the CO2 using water displacement.

Results
My experiment showed that with some simple carbohydrates, dextrose and sucrose, yeast made 190 ml and 140 ml of CO2. Some complex sources of carbohydrate, such as corn, rice, and soybeans, made much less CO2. I found that if I added the enzyme alpha amylase, I could make some carbohydrates sources, like corn, easier for yeast to use and increasing the CO2 made. I also found that the simple carbohydrate, lactose, could be used better if I added the enzyme lactase.

Conclusions/Discussion
I met many of my objectives. I supported my hypothesis by showing that, in general, yeast have a more difficult time using complex carbohydrates than simple carbohydrates. I was also able to show that yeast could be helped in growth by adding enzymes to break down the carbohydrates.

Summary Statement
I used different carbohydrate sources to see which helped yeast to grow and make more CO2.

Help Received
My teacher, Ms. Markel, guided me through the science fair process. My parents guided me in the safe use of the kitchen as my lab and helped proofread my work.