CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Jacki S. Edens

Project Number
J1705

Project Title
Sugar Rush

Abstract

Objectives/Goals
This project was designed to test if yeast colonies would grow faster with or without oxygen and with different sugars. Faster growth is important to the brewing process because it increases accuracy and speed. My hypothesis was that Sucrose with oxygen would promote the most yeast growth.

Methods/Materials
1. Oetker (Brand) Dry yeast (1 gram total). 2. MoreFlavor (Brand) Maltose (8 grams). 3. G&H (Brand) Sucrose (8 grams). 4. Now Foods (Brand) Fructose (8 grams). 5. Water (about 200 milliliters). 6. Incubator. 7. Ten 100 micro liter tubes with lids. 8. 200 micro liter pipette. 9. 1000 micro liter pipette. 10. Spectrophotometer. 11. 11 tubes fit for spectrophotometer (1 for clear water).

Spectrophotometer readings were measured using transmittancy. Transmittancy measures the amount of light that passes through the yeast solution. Less light is able to pass through with a higher density of proteins meaning there is more growth, when reading the data; a lower percentage is the measurement of greater growth. Clear water is 100% transmittance, because there are no proteins to stop the light.

Results
Maltose transmitted the least light, with 10% passing through without oxygen and 9% with oxygen. All sugars transmitted 13% of light without oxygen and 12% with oxygen. Fructose let had 93% transmittance with oxygen and 92% without oxygen. No Sugar transmitted 95% with oxygen and 92% without. Sucrose transmitted a lot of light with 98% transmittancy with oxygen and 93% with oxygen. Therefore Sugars (Maltose) with two units of glucose apposed to one grew faster.

Conclusions/Discussion
My hypothesis of sucrose growing the most with oxygen was not supported by the results. Sucrose with oxygen ended up growing the least out of all of the solutions. I thought sucrose, or white table sugar, would end up growing the most because it seemed like the best food source as it is processed differently using a raw sugar syrup and heavy syrup before it is dried. Sugar from fruit and barley are not processed in this way. Sucrose therefore seemed to offer more of a food source for this experiment.

Summary Statement
It is a project on the effect of sugar and oxygen on yeast growth

Help Received
Anne Marie Barnett helped pick out project; Ms. Hutton helped with testing.