



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Kevin T. Hoffman</b>	<b>Project Number</b> <b>S1309</b>
<b>Project Title</b> <b>Alcoholic Fermentation by <i>Saccharomyces cerevisiae</i> in Different Carbohydrates</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this experiment was to determine what type of carbohydrate was utilized best in the alcoholic fermentation process. <b>Methods/Materials</b> A yeast solution was prepared by mixing <i>Saccharomyces cerevisiae</i> in water. This was divided into different containers; the same amount of water was poured into another as a control. Different carbohydrates were added to each container. The carbohydrates used were sucrose, fructose, Splenda, and glucose. Sucrose was also used for the control. The specific gravity of the liquid in each container was measured with a hydrometer, and then each solution was allowed to ferment undisturbed for five days. After this time, the specific gravity was measured again with the hydrometer. The difference in the specific gravity at the beginning and at the end was determined. A change in specific gravity shows that the yeast had utilized carbohydrate. <b>Results</b> Glucose had the greatest mean change in specific gravity over the five-day trial period ( $0.08 \pm .003$ , $n=3$ ). Splenda displayed the least mean change ( $0.0 \pm .002$ ). The control did not change. <b>Conclusions/Discussion</b> The yeast utilized glucose the best in alcoholic fermentation; this was shown in the fact that glucose had the greatest mean change in specific gravity. I interpreted that the yeast is best suited to fermenting glucose, possibly for a few reasons. For example, glucose may have a smaller molecular size than the other carbohydrates tested, which would mean that it could get into the yeast cell more easily. Because Splenda showed a mean change of 0 ( $n=3$ ), it shows that it is very inefficient in the alcoholic fermentation process. The absence of change in the control container supports the theory that no force other than the alcoholic fermentation by the yeast was causing the specific gravity to change.	
<b>Summary Statement</b> This project is designed to test the utilization of different carbohydrates in alcoholic fermentation by yeast.	
<b>Help Received</b> Father proof-read report; mother helped paste things on board	