



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Scott L. Karney-Grobe	Project Number J1314
Project Title Yeasts 'n Sweets	
Abstract Objectives/Goals My objective is to see if yeast will reproduce using various sugar substitutes. Methods/Materials One thermos with 1/4" hole in top, dry yeast, pressure gauge, sugar, saccharin, sucralose, NutraSweet, Ace-K, white flour, water, salt, 5 oz. souffle cups and oven bowls. Three tests, using sugar and each artificial sweetener were performed to determine yeast reproduction: Measuring CO(2) release from dough, counting yeast cells in a dough slurry with a microscope, and measuring dough rise in yeast-risen bread. Results The control made with sugar outperformed all of the artificial sweeteners. It gave off the most gas, had the largest number of yeast cells and resulted in bread with a good rise. Three of the artificial sweeteners failed in all three tests. Only Sucralose showed some promise: limited gas release, slight increase in yeast cells, and a dense, chewy bread loaf. Conclusions/Discussion Yeast cannot reproduce using sugar substitutes as a substrate. The yeast require the exact structure of sucrose to enable fermentation. All the data suggest that Sucralose did the best because it's structure is the most similar to sugar. Sucralose replaces two hydrogen molecules with two chlorine molecules. It seems that the closer an artificial sweetener chemically resembles sugar, the more it behaves like sugar.	
Summary Statement To see if yeast will reproduce using sugar substitutes as the substrate for yeast fermentation.	
Help Received Mom helped type and edit, Dad drilled the 1/4" hole in the thermos lid for the pressure gauge , and Mr. Kaleikau taught me to recognize yeast cells using a microscope.	