



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Rachel M. Halper	Project Number S0405
Project Title The Efficiency of Lactase	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this experiment is to test the efficiency of lactase enzyme, with varying concentrations and temperatures of lactose.</p> <p>Methods/Materials The materials used were: Lactose Sugar, Lactase Enzyme, Water bath, Distilled water, Glucose test strips, 10mL test tubes, 600 mL glass bottle, and dextrose. The first test done was to test the glucose test strips accuracy. The glucose test strips were able to test for concentrations of glucose at 0.005M, 0.015M, 0.030M, 0.060M, and 0.110M. So, solutions of dextrose, with these molarities, were made. Then they were tested using the glucose test strips. The test showed the strips were accurate. Then 2 liters of a 1M lactose solution was made. 3mL of the solution at room temperature were tested with 2 drops of the lactase enzyme. The a glucose test strip was placed in the solution and the concentration was read off of it. Then 80mL of the solution was heated it up in increments of 5 degrees starting at room temperature. Every five degrees the solution was tested for glucose. This was continued until the maximum amount of glucose was detected. The lactose solution was then decreased in increments of .2M. At each concentration, the solution was heated up in increments of 5 degrees and test for glucose every 5 degrees.</p> <p>Results When the concentration of the lactose is lowered, the temperature at which the maximum amount of glucose is tested becomes lower. So, at lower concentrations of lactose the lactase becomes more efficient.</p> <p>Conclusions/Discussion From the results of this experiment, the researcher can see that as the concentration is lowered and as the temperature increases of lactose, more glucose was detected. But, at lower concentrations, the temperature wasn't as high when the maximum amount of glucose was detected. More glucose was detected as the temperature increases because the bonds in the lactose are weaker due to the heat. So, the same amount of lactase will detect more glucose because the enzyme has less work to due.</p>	
Summary Statement This project tests lactase's ability to dissociate lactose into glucose and galactose.	
Help Received	