



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> Nathaniel S. Carson	<b>Project Number</b> <b>J1305</b>
<b>Project Title</b> <b>How Much Longer Does It Take Bread with Preservatives to Grow Mold Than It Takes Bread without Preservatives?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of my project is to find out how much longer it takes bread with preservatives to grow mold than it takes bread without preservatives. By working on this project, I hoped to learn more about preservatives and different types of mold. My hypothesis is that it will take bread with preservatives at least a month longer to grow mold than it takes bread without preservatives to grow mold. <b>Methods/Materials</b> Methods: 1.Buy bread with and without preservatives. 2.Place slices in sealed, labelled Ziploc bags. 3.Observe bread. 4.Document when, where, and what color mold is growing on the bread. Materials: 4 loaves of bread: whole wheat bread with and without preservatives, white bread with and without preservatives; Ziploc bags; Sharpie pen; Magnifying glass <b>Results</b> Mold started growing on the honey white bread without preservatives after 6 days. After 27 days, the bread was 100% covered with mold or other organisms. Mold started growing on the honey whole wheat bread without preservatives after 12 days of observations. After 27 days, the bread was 33.7% covered with mold. I calculated the percentages by tracing my observations onto graph paper, counting the total number of squares, counting the number of squares for each color of mold, and dividing that into the total number of squares. Mold has not yet grown on either piece of bread that contains the preservative calcium propionate after 27 days. <b>Conclusions/Discussion</b> My conclusion is that it took more than 27 days longer for bread with preservatives to grow mold than it took bread without preservatives to grow mold. A lot of the bread at our house gets moldy before we have a chance to eat it, so we end up wasting a lot of bread. My results indicate that my family should buy bread with preservatives to fix this problem. Because my family prefers to eat bread without preservatives, I would like to continue this study by studying how to keep mold from growing on the bread. Some suggestions that I have seen are to put the bread in a cool, dry place like the refrigerator or in a cupboard, and to clean the area where bread is stored with Lysol to keep the mold and bacteria from spreading to new loaves of bread.	
<b>Summary Statement</b> The purpose of my project is to find out how much longer it takes bread with preservatives to grow mold than it takes bread without preservatives to grow mold.	
<b>Help Received</b> Mom helped me get ideas and showed me how to make graphs. Dad helped me analyze my results. My teacher, Ms. West helped me with the scientific method. Mrs. Eleanor, our librarian, helped me find books about mold. Melisa Walker reviewed this report with me.	