



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Leah M. Ostermann	Project Number J2124
Project Title That's the Pits	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this experiment is to determine what preservatives keep fruit from turning brown the longest.</p> <p>Methods/Materials Pureed apple, banana, & avocado (480 mL each) were measured into 6 separate containers (3 trials each). Then 2.5 mL of each preservative (salt, sugar, lemon juice, avocado pit, & vegetable oil) were measured separately into the fruit & stirred. As the control, one container of each fruit did not contain any preservative. The color of the fruit was measured at similar time periods over the next 2 days using a color scale.</p> <p>Results Salt was the best preservative for apples by far. Even 2 weeks after the start of the experiment, the apples did not turn brown. Lemon juice & salt in bananas slowed the browning a little more than the other preservatives. For avocados, none of the preservatives slowed the browning. Adding salt to avocados increased the browning even more than with no preservative. The avocado pit, sugar, oil, & control all gave about the same results for all 3 fruits.</p> <p>Conclusions/Discussion When fruit is peeled or cut open, oxidation occurs. Oxygen reacts with the iron-containing phenols in the fruit. The oxidation forms sort of a rust on the surface of the fruit to cause browning. Fruit also contains natural enzymes in the cells. Pectolytic enzymes bring about a gradual ripening of fruit causing it to become softer by breaking down the cell walls. Enzymes act as catalysts for the oxidation reaction or speed up the ripening or browning of the fruit. Both physical and chemical methods inhibit oxidation typically by denaturing the enzyme.</p> <p>My hypothesis that lemon juice is the best preservative was not proven. Because each fruit has different enzymes that act as catalysts to speed up the browning, no one preservative will denature (break down) all the enzymes in all fruits the same. For example, salt denatures the enzyme in the apple the most probably by removing water from the cells. Without water the enzyme denatures & the apple doesn't brown. But salt browns the avocado the fastest. So salt somehow helps the enzyme brown the avocado. The experiment proves the research that using an avocado pit to keep avocado from browning is a myth.</p>	
Summary Statement This project determines which preservatives prevent browning in fruit the best.	
Help Received My parents helped with the procedure. My Mom helped with the graphs.	