



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

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| Name(s) Payge N. Estrada | Project Number J0599 |
| Project Title Preserve... If You Dare | |
| Objectives/Goals The problem was how will the chemical sodium benzoate effect the rate at which the catalase react. My hypothesis is that the chemical sodium benzoate will affect the rate at which the catalase react due to the fact that sodium benzoate is a toxic powder that when consumed or used will choke cells and not allow the catalase to function and react to any harm that will influence the body thus the liver alone without the sodium benzoate will have a quicker reaction time than the liver with 1 g & 2 g of sodium benzoate. | |
| Abstract The problem was how will the chemical sodium benzoate effect the rate at which the catalase react. My hypothesis is that the chemical sodium benzoate will affect the rate at which the catalase react due to the fact that sodium benzoate is a toxic powder that when consumed or used will choke cells and not allow the catalase to function and react to any harm that will influence the body thus the liver alone without the sodium benzoate will have a quicker reaction time than the liver with 1 g & 2 g of sodium benzoate. | |
| Methods/Materials Make a hydrogen peroxide solution by adding distilled water to 3% hydrogen peroxide. Punch holes from a filter with a hole puncher. Make a catalase solution by placing a liver in a blender with distilled water, use forceps to dip a filter disk into the catalase solution. Fill test tube with hydrogen peroxide solution. Grab a one-hole stopper and use forceps to take the soaked filter disk and place on the end of the one-hole stopper. Push the one-hole stopper into the test tube, place your thumb over the hole in the stopper, invert the test tube and remove your thumb, starting the stop watch. Record the time it takes for the disk to rise to the top of the test tube. Repeat these steps with a catalase solution that contains 1 g & 2 g of sodium benzoate. Let all the catalase solutions sit in refrigerator for 12 hours. Place the solutions back in the refrigerator for 12 more hours then conduct final trials. | |
| Results My hypothesis was proven correct. My hypothesis was correct because at 0 hours the controlled solution had an average time of 8.89 seconds, the 1 gram solution had an average time of 12.23 seconds, & the 2 grams solutions had an average time of 16.76 seconds. After 12 hours the controlled solution had an average time of 11.71 seconds, the 1 g solution had an average time of 15.83 seconds, & the 2 g solution had an average time of 20.07 seconds. After a total of 24 hours the controlled solution had an average time of 12.61 seconds, the 1 g solution had an average time of 18.55 seconds & the 2 g solution had an average time of 19.9 seconds. | |
| Conclusions/Discussion My data proved that my hypothesis was supported. My science fair topic ties into the real world because the consumption of sodium benzoate can be permanent. Too much sodium benzoate can lead to many side effects, changes to the cells in your body, liver diseases and failure, which can lead to cancer and death. | |
| Summary Statement My project was to test the effects of the preservative Sodium Benzote on the catalase enzymes in the liver. | |
| Help Received Ms. Fisher gave me resources and a place to work; Zach Hutchings helped me with timing and collecting data; my mom provided materials; took pictures and helped me document data; my sister helped with my binger and science fair tips; the judges gave me feedback and reveiwed my project | |