



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> Sarah Sumner	<b>Project Number</b> <b>J2115</b>
<b>Project Title</b> <b>Will Certain Spices Increase or Decrease an Organism's Heart Rate?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My objective was to investigate how natural spices effects an organisms heart rate. My second objective was to see if the heart rate stayed constant.</p> <p><b>Methods/Materials</b> The materials needed for this projects were: 1. Daphnia Magna; 2. Bottled spring water; 3. Fresh Ginger; 4. Powdered Cinnamon; 5. Powdered Turmeric; 6. Minced Garlic; 7. 5 Clear Bowls; 8. 20x Microscope; 9. Yeast; 10. Timer; 11. Small cap to measure the spice.</p> <p>For this project I put six daphnia into five small bowls with 1 1/2 cups of water. Then I added a very small amount of the test spice to container with live daphnia. There was a wait time of 24 hours for test spice to defuse into water and to ensure the environment would be sufficient for the trial. After that, I placed daphnia onto a microscope slide and counted the daphnia heartbeat by taping in rhythm for 1 minute on 2 daphnia per each sample and averaged the two. I repeated this test four days for each of 7 trials (280 readings).</p> <p><b>Results</b> After 280 heart rate readings of all five samples, the daphnia heart rate in the ginger sample showed an average increase of 10.11 beats per minute as compared to the control sample that was just placed in spring water with yeast as a source of food, the tumeric sample showed an increase of 4.23 bpm, the cinnamon sample showed a decrease of .39 bpm, and the garlic sample showed a decrease of 1.55 bpm. I noticed a pattern in the readings in each 4 day trial. Measurements taken on day one of each trial showed a change from the measurements taken on day four. This could possibly be because the spice's effectiveness started to wear off during the four day trial.</p> <p><b>Conclusions/Discussion</b> After completing my investigation on the spice effects on the daphnia heart rate, I found my first hypothesis was correct. My hypothesis stated that ginger would have the greatest effect on the daphnia heart rate. The results showed that ginger did the greatest effect on the heart rate. My second hypothesis was incorrect. It stated that there would be a consistent change in the heart rate from being exposed to a specific spice for four days. Although ginger and tumeric had a consistent change, both garlic and cinnamon had large fluctuations throughout the continuous four day observation. This information could be helpful to the medical community, since over 600,000 people die from heart disease in the United States each year.</p>	
<b>Summary Statement</b> Over 600,000 people die from heart disease each year in the U.S., but certain spices could be beneficial in helping to maintain a healthy heart.	
<b>Help Received</b> My mother helped my with my board, and a teacher helped me create a complicated chart.	