CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
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Project Number
S1819

Project Title
Caffeine: Friend or Foe?

Abstract

Objectives/Goals
Our goal is to examine the affects of caffeine on humans and then on Daphnia and compare the results to see if they are related.

Methods/Materials
We started with our human testers giving them a different type of caffeinated source and then testing their heart rate, breathing rate and reaction times. After a week of testing we then separated our Daphnia into different testing groups for each substance with one control group. We then fed them the substances and observed them under a microscope. We found their heart rate and observed their behavior. After gathering all of our data we will conclude if caffeine has a similar affect on Daphnia Magna as on humans. Materials: Rockstar, Redbull, Monster, 5 Hour Energy, Coffee, Daphnia Magna, fish tanks, microscope, human volunteers.

Results
Our results were that caffeine affects humans and Daphnia. We used a more concentrated source of caffeine in the Daphnia. The more concentrated dose had a greater affect on the heart rate than the smaller doses.

Conclusions/Discussion
After testing the daphnia we noticed many different changes. After the daphnia were given the carbonated drinks they seemed to have a reaction to it causing their hearts to stop. A possible cause of this was the Carbon Dioxide bubbles using up all of the Oxygen causing them to go into a state of shock. We have concluded that when a large amount of caffeine is digested in a short amount of time there will be a drastic affect in heart rate. Even the majority of daphnia that did not go into a state of shock had a drastic change in their heart rate or activity. Our experimental faults were: stressing out the daphnia which could lead to a higher heart rate, too much concentration of the energy drink, incorrect counting, leaving the daphnia in the water with the drinks for too long, and overheating. Our control was the starting heart rate, our dependent variable was the final heart rate, and the independent variable was the energy drinks. For humans, with a smaller dose, the effects on their hearts wasn#t as pronounced. In many of the cases however, we did have a small increase in the heart rate. This project shows that too much caffeine is not ideal for a healthy lifestyle.

Summary Statement
We administered caffiene in the form of 5 popular energy drinks to Daphnia Magna and Humans comparing their heart rates to see if they are related.

Help Received
Used our chemistry teacher's microscope.