CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)

Mirna H. El-khalily

Project Number

S1709

Project Title

Using Different Types of Herbal Infusions to Protect against Loss of Bone Mass Due to Caffeine

Abstract

Objectives/Goals
The objective of this experiment is to determine which herbs would increase mineral bone density and which would protect against bone loss caused by the caffeine in Coke. My hypothesis was "If chicken bones are placed in a Red Clover, Alfalfa, Stinging Nettle, and Horsetail infusion then the bones in the Red Clover infusion will have the greatest increase in bone density and protection against caffeine."

Methods/Materials
Using an electronic balance to find mass and graduated cylinder to find the volume, the original densities of five chicken bones were measured. Each bone was placed in a different herbal infusion consisting of 500 mL of boiling water and 15 grams of each herb. The different herbs that were tested were Red Clover, Alfalfa, Stinging Nettle and Horsetail. After soaking for 5 hours, the the new densities of the bones were measured and the change in density from before to after soaking was calculated. Each bone was then placed in 500 mL of Coke for 2 hours. The new density and change in density of each bone was measured again.

Results
After soaking in the herbs, Alfalfa had the greatest positive average change in bone density of +0.017 g/mL and Stinging Nettle had the greatest negative change in density of -0.0153 g/mL. After soaking in the Coke, Stinging Nettle had the greatest positive overall difference in density of +0.0356 g/mL and the control had the greatest negative average change of -0.021 g/mL.

Conclusions/Discussion
In conclusion, Alfalfa had the greatest increase in the mineral bone density. In addition, Stinging Nettle had least decrease in density after soaking in the Coke, meaning it had the greatest protection against bone loss caused by the caffeine present in the Coke.

Summary Statement

The central focus of my project is to see which herb helps increase bone density and which herb helps protect against the harmful effects of the caffeine found in Coke.

Help Received

Mother helped buy supplies; Science teacher helped organized information on poster board