CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

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Project Number

34068

Project Title

Just Beat It: Would Lowering the pH in Egg Whites Affect the Volume of Foam Produced by Beating?

Abstract

Objectives/Goals

I wanted to discover if lowering the pH in egg whites affects the foam produced by beating the egg whites. My hypothesis was if I lower the pH of egg whites, by adding lemon juice, then the eggs will foam with a greater volume. The more lemon juice added, the more foam will be produced.

Methods/Materials

I treated equal amounts of egg whites (2 fl oz) with the control (water) or lemon juice. I beat the egg whites at the same speed and for the same period of time. I then measured the volume of foam and recorded the pH of each of the egg white trials. I used eggs, lemon juice, an electric egg beater, water, various measuring cups and beakers, a pH meter, and a stop watch.

Results

The average volume of the egg whites after the first control (adding one tsp. of water) was 1.91 cups, and their pH was 9.06. The average volume of the egg whites after adding one teaspoon of lemon juice was 2.16 cups, and their average pH was 8.45. The average volume of the egg whites after the second control (adding two tsp. of water) was 1.83 cups, and their average pH was 9.13. The average volume of the egg whites after adding two teaspoons of lemon juice was 2.33 cups, and their average pH was 6.33.

Conclusions/Discussion

In this experiment, I found that lowering the pH in egg whites does affect the foam produced by beating the egg whites. Lemon juice lowers the pH in egg whites, and increasing the amount of lemon juice added increased the volume of foam that was produced. Based on the data collected, my hypothesis appeared to be correct. Adding one teaspoon of lemon juice led to more foam than the control, and adding two teaspoons increased the volume further.

Summary Statement

This project was created to determine if lowering the pH in egg whites would affect the volume of foam produced by beating the egg whites.

Help Received

I used the the lab and pH meter at Trefethen Vineyards in Napa, under the supervision of my dad, Zeke Neeley. My mom read over the science board papers to make sure they were grammatically correct.

Preliminary