CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
Addison L. Arsenith

Project Number
J1902

Project Title
Which Preservative, Synthetic or Natural, Will Inhibit the Growth of Bacterial Microorganisms?

Abstract

Objectives/Goals
The purpose of my project was to determine which preservative, synthetic or natural, would best inhibit the growth of bacterial microorganisms.

Methods/Materials
27-5% blood agar plates, 1 oz. Potassium Sorbate, ¼ cup of sea salt, 6 cups low sodium chicken broth, 27 UL inoculating loops, 1 ½ cups water, 3 glass jars with lids, marking and measuring tools
This experiment was done by selecting a synthetic preservative-potassium sorbate and a natural preservative-sea salt and adding a 25% solution of each to separate mason jars each filled with 2 cups of low sodium organic chicken broth. The control had 2 cups of the same broth. The mason jars sat out for 3, 6, and 9 days at room temperature. On the third day, I took an inoculating loop, 3 blood agar plates labeled for each solution and then streaked each agar. Plates were set in a warm room for 5 days to incubate. Observations were made daily on bacterial intensity observed on the agar plates. Process was repeated on Day 6 and Day 9 with 3 plates for each solution.

Results
My hypothesis, that the sea salt solution would work best at preserving foods, was not supported by the experimental data. The results showed in all of the observations I made, that the sea salt was the worst at preserving the chicken broth. The potassium sorbate was the best for preserving the chicken broth.

Conclusions/Discussion
I believe that I got these results because the agar plates with sea salt allowed bacteria to grow quickly because of hemolysis. The appearance of these plates after incubation was notably different. Also, the bacteria on these plates were visible before the control group and the potassium sorbate group. The potassium sorbate preserved the broth solution so well that bacteria was unable to grow until after the fourth day of incubation.
The information gained from this project could be used by supermarket owners trying to keep their food from spoiling. This information could also be used by ordinary people who don't want their food to spoil.

Summary Statement
This experiment tested two preservatives, sea salt and potassium sorbate, to determine which was most effective at inhibiting the growth of bacterial microorganisms in chicken broth at room temperature for 3, 6, and 9 days.

Help Received
Mom purchased supplies. Dad held plates during streaking process. My teacher, Mr. Scott helped to edit my project report. Dr. Musau Wakabongo provided a safe place to view my final agar plates and made sure that the materials from my experiment were safely disposed of using the lab#s autoclave.