CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
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Project Number
J1724

Project Title
Spice It Up: The Effect of Spices on Bacteria

Abstract

Objectives/Goals
The objective is to determine if spices have the ability to inhibit the growth of bacteria that commonly cause food poisoning.

Methods/Materials
Three different types of bacteria, Staphylococcus epidermidis, Bacillus cereus, and Escherichia coli, were incubated on a total of 72 nutrient agar plates. Eight different spices were each mixed with sterile water and applied to these plates. Bacterial colony counts on these plates were then recorded and compared to the control group which had the bacteria and sterile water only. In a second portion of my project, the effect of the same spices applied to diffusion disks on pure bacterial cultures was also measured.

Results
I found that cumin, lemon juice, cloves, and salt had the greatest inhibitory effect on the bacteria Escherichia coli and Staphylococcus epidermidis. Salt, cinnamon, oregano, and garlic had the greatest inhibitory effect on Bacillus cereus. For all three bacteria species, pepper was the poorest inhibitor.

Conclusions/Discussion
This experiment showed that spices do have the ability to inhibit bacterial growth. Certain spices were found to be more effective than others. Bacillus cereus was found to be more resistant to spices than Escherichia coli and Staphylococcus epidermidis.

Summary Statement
The objective is to determine if spices have the ability to inhibit the growth of bacteria that cause food poisoning.

Help Received
Father and mother supervised and helped culture bacteria and apply spices; Sister helped with box-and-whisker calculations with TI-84 calculator.