CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J1808

Project Title
Examining the Cleaning Effects of Practical Household Solutions on Produce

Abstract

Objectives/Goals
The purpose of my project was to investigate ways to clean produce with the intention of reducing/eliminating bacteria. I tested bacteria counts on spinach and green onions. I used 4 methods of treatment. My hypothesis was that exposure to ultraviolet light for 120 seconds would have the greatest reduction in bacteria. My goal was to find a method of cleaning vegetables that would decrease bacterial contamination on food.

Methods/Materials
Method for spinach trials;1-Separate unwashed spinach into 5 piles with 15 leaves in each; 2;-Fill 15 test tubes with 10ml of distilled water; 3-Swab 2cm of the stem and 2 cm of the spinach leaf; 4-Cut swab into a test tube; 5-Swirl for 30 seconds; 6-With pipette, draw 1/10th ml of the solution; 7-Drop the 1/10th ml onto agar plate; 8-Dip a bent glass rod into methanol alcohol; 9-Sterilize glass rod; 10- rotate glass rod around the agar plate to even out solution; 11-incubate 48 hours 37°C; 12- Remove and tape closed; 13-Count bacteria colonies, record results; 14- repeat 3-13 14 times for a total of 15 trials. Tap water: Repeat steps 1-2; Wash 15 spinach leaves in 2 liters of tap water for 60 seconds; Repeat 3-14. Hydrogen Peroxide: Repeat steps 1-2; Wash 15 spinach leaves in 2 liters of a 0.3% solution of hydrogen peroxide for 60 seconds; Repeat 3-14. Repeat steps 1-2; Place 15 spinach leaves 10cm under a germicidal UV light for 60 seconds; Repeat 3-14. Repeat steps 1-2; Place 15 spinach leaves 10cm under a germicidal UV light for 120 seconds; Repeat 3-14. Green onion trials: Repeat the entire process using green onions in place of spinach.

Results
Spinach; On average the least amount of bacteria was on spinach treated under UV light for 120 seconds with 28 bacteria colonies. Control had 279 colonies. Green onions; On average the least amount of bacteria was on green onions treated under UV light for 60 seconds with 15 bacteria colonies. Control had 116 colonies on average.

Conclusions/Discussion
I correctly predicted that spinach exposed to UV light for 120 seconds would have the least amount of bacteria colonies. Control was not the highest as I had expected. Exposure to UV light for 60 seconds had 5% more colonies than the control. Green onions: 60 second exposure to UV light had the least amount of bacteria (vs. the 120 second exposure I predicted). The control on green onions had the highest bacteria counts as I predicted.

Summary Statement
Testing different methods of cleaning vegetables to see what best reduces or eliminates bacteria.

Help Received
My mom helped with the typing and she took pictures. Mr. Whittington, a high school biology teacher, helped me figure out the best methods for taking bacterial samples. He also provided lab equipment.