CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
Connor M. Keefe

Project Number
J1417

Project Title
Hand Washing Techniques: What Works Best?

Abstract

Objectives/Goals
The goal of this project was to determine the optimal techniques for reducing the bacterial contamination of my finger pads, using common cleaning methods available in most households, after doing a variety of household activities.

Methods/Materials
I used three types of bacterial contaminated substances; highly contaminated, moderately contaminated, and mildly contaminated. After performing a control plating on chocolate agar Petri dishes, I performed an intervention which was rinsing my hands in water for 10, 20, and 30 seconds each, washing my hands with soap & water for 10, 20, and 30 seconds each, and using non-alcohol or alcohol based antiseptic for 1 and 2 squirts each. Following the intervention I plated the same two fingers on the other half of the Petri dish. The plates were photographed and area in sq mm of growth calculated. I examined 6 finger pads at each intervention point.

Results
For the highly contaminated media, washing with soap & water for 20 seconds worked best, but rinsing your hands in water for 30 seconds also worked well. For the moderately contaminated bacteria using alcohol based antiseptic worked the best, but rinsing your hands in water only while rubbing them together worked almost equally as well. For the mildly contaminated bacteria everything worked well.

Conclusions/Discussion
The data indicated that while the soap and mechanical rubbing that occurs with hand washing is important, the most important factor may be letting the water continuously run over your hands while washing so that the bacteria are rinsed off more effectively. This dilution of bacteria by continuously running water combined with mechanical rubbing appeared to be the most effective in decreasing the concentration of bacteria on finger pads.

Summary Statement
Determining the optimal cleaning techniques for finger pads after doing a variety of household activities

Help Received
Father helped with experimental design, computer software use, and photography.