



CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

Name(s) Daniel Chayes	Project Number J1504
Project Title How to Clean Your Brush to Destroy Your Mouth Mush	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my experiment is to determine which method of cleaning a toothbrush gets rid of the most bacterial content on the brush: hot water, hydrogen peroxide, salt water, UV cleaner, no-heat dry dishwasher cycle, or high heat dishwasher cycle. Each method will be tested with two toothbrushes. It is hypothesized that the UV cleaner will destroy the most bacteria.</p> <p>Methods/Materials A person brushes their teeth and makes sure that saliva remains on ten toothbrushes, even if that means submerging the bristles of the toothbrush into a cup of saliva. Toothbrushes are then laid flat for two days in a warm area. Then, cotton swabs are used to transfer bacteria from each brush to ten different petri dishes. Each pair of toothbrushes is cleaned in methods listed above and again, a swab is used to transfer bacteria to ten new petri dishes. Petri dishes sit in an incubator for three days. Data is recorded and analyzed.</p> <p>Results After I put all the petri dishes in the incubator with a temperature of 95 degrees Fahrenheit, I observed that small dots appeared about 24 hours later, but they were not large enough to count until 48 hours and after that, they grew slightly larger, but no new colonies appeared. I repeated the UV cleaner a second time in case of a malfunction. I also repeated the dishwasher on high heat instead of a no-heat dry cycle. I used the Promega Colony Counter (PCC) app, but I noticed it did not portray accurately the amount of bacteria. The program allowed me to mark additional colonies and erase false ones, and so I tried to make the count as accurate as possible. All photos were taken at 48 hours.</p> <p>Conclusions/Discussion The high heat dishwasher cycle, hydrogen peroxide, and boiling water proved to be the most effective at killing bacteria. The results with the hot water from the dishwasher and from the cup were quite definitive: virtually all bacteria was destroyed. The methods that did not use hot water, which were salt water, the UV cleaner, and a non-heated dishwasher cycle, were not effective in destroying bacteria. The hydrogen peroxide was also very effective as a means to destroy most bacteria. The hypothesis which stated that the UV cleaner would be most effective was incorrect.</p>	
Summary Statement My project determines which of 5 methods of cleaning a toothbrush is most effective at destroying bacteria on the brush.	
Help Received Mother guided me while I worked with petri dishes. Mother helped in proper disposal of petri dishes.	