



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Karishma Shah	Project Number 33528
Project Title Bacterial Colonization on Apples and the Efficacy of Various Cleansing Methods	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment was to measure the growth of bacteria on apple surfaces and compare the effectiveness of a plain water rinse to a commercially available fruit and vegetable cleanser, Veggie Wash, at reducing bacterial counts.</p> <p>Methods/Materials A total of 80 apples were tested in this experiment. Each apple was cut into three pieces and each petri dish was divided into three sections. A sterile cotton-tipped swab was used to wipe the surface of one of the apple slices without cleaning it at all. It was then used to inoculate one section of the petri dish. This served as the control. The surface of the second piece of apple was rinsed with Arrowhead brand bottled water and swabbed on the second section of the petri dish. Next, the surface of the third apple piece was washed with the fruit and vegetable soap Veggie Wash and swabbed on the third and last section of the petri dish. This procedure was repeated for each apple (each apple having one slice for the control, one for the plain water rinse, and one for the Veggie Wash rinse) and petri dish in the first trial. The petri dishes were then placed in an incubator set to 37 degrees Celsius for 6 days. Every day, the bacterial colonies were counted, recorded, and photographed. Each trial contained 10 apples. A total of 8 trials were conducted.</p> <p>Results Overall, the average bacterial colony count in the untreated control group was 7.75. The average bacterial colony count in the group that was treated with plain water was 1.7. The average bacterial colony count in the group that was treated with Veggie Wash was 2.2.</p> <p>Conclusions/Discussion Apples are one of the most popular fruits in the United States, but they happen to be among the dirtiest as well. This experiment demonstrated that there is a considerable amount of bacterial growth from the surface of apples that are bought from the grocery store. Rinsing the apple surfaces with plain water was found to be just as effective at removing bacteria as Veggie Wash.</p>	
Summary Statement This experiment compared the effectiveness of a fruit and vegetable cleanser (Veggie Wash) to a plain water rinse at removing bacterial on apple surfaces.	
Help Received Ms McCabe (science teacher) provided advise and loaned incubator; Parents helped purchase supplies; Brother helped take photographs	