



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Sergio Bermudez</b>	<b>Project Number</b> <b>J1504</b>
<b>Project Title</b> <b>Lime Juice Eliminates Bacterial Growth</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My objective was to determine how will lime juice affect the growth of pathogen bacteria (E.coli) and how much time will it take for the lime juice to reduce the bacteria by 95%.</p> <p><b>Methods/Materials</b> .114 kg Alaskan Cob fish and .228 kg Tilapia fish (frozen) were used on Nutrient Agar petri dishes (Bioxon) to isolate E.coli. The use of sterile swabs 6#, Blood agar petri dishes, EMB agar petri dishes, S-S agar petri dishes were necessary for identification of the bacteria. 1 mL saline solution, 1 mL concentrated lime juice and 1 colony of E.coli were introduced in test tubes and set at different times to prove that lime juice affects bacterial growth.</p> <p><b>Results</b> My raw data found that my test tube that lasted 1 hour and 45 minutes with the lime juice reduced the bacteria by 100%, and had absolutely no bacterial growth. Under the microscope, I observed the Tilapia and the Alaskan Cob#s fish released liquid and I found different types of bacteria such as staphylococcus, streptococcus, and bacillus as well as others. I decided to only concentrate on E.coli, because it is commonly found in contaminated food and is harmful to human beings.</p> <p><b>Conclusions/Discussion</b> The citric acid in the lime juice can kill E.coli in one hour and forty-five minutes because the cell membrane of E.coli is made of lipids and sugars that can be easily dissolved by the citric acid.</p>	
<b>Summary Statement</b> Lime juice eliminates E.coli growth in one hour and forty-five minutes.	
<b>Help Received</b> Mother helped in driving and transportation.	