



**CALIFORNIA STATE SCIENCE FAIR  
2017 PROJECT SUMMARY**

<b>Name(s)</b> <b>Prashant P. Naidu</b>	<b>Project Number</b> <b>S1614</b>
<b>Project Title</b> <b>Treating with Turmeric: An Alternative in Treating Foodborne Illness-Causing Bacteria</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To determine if various concentrations of a turmeric solution would inhibit the growth of bacteria that are responsible for causing foodborne illnesses.</p> <p><b>Methods/Materials</b> Gram-negative bacteria, Escherichia coli O157:H7, Shigella, and Salmonella enterica, were tested for susceptibility with a full strength, half strength, and quarter strength turmeric solution and compared to the zone of inhibitions when the bacteria were treated with ampicillin. The initial or full strength solution consisted of 10 grams of powdered turmeric combined with 250 mL of saline. An additional 250 mL of saline was added to obtain the half strength solution, then an additional 250 mL was added to obtain the quarter-strength solution. All three concentrations of the solution were applied to both filter paper diffusion disks and Vancomycin disks. Disks were placed on agar plates streaked with a bacteria and incubated as part of the in vitro method. Zone of inhibitions were recorded by measuring the diameter in millimeters and compared to a chart to determine if the solution was susceptible, intermediate, or resistance to each bacterium. The experiment was completed twice, with Vancomycin disks saturated with the various concentrations of solution only used in the second round.</p> <p><b>Results</b> The outcome for both rounds was positive. The full strength or initial turmeric solution was most effective in inhibiting the growth of each bacterium. The ZOI (Zone of Inhibitions) for the bacteria, when treated with ampicillin, had an average diameter of 16.5 mm. The ZOI of the bacteria, when treated with the full strength solution, had an average diameter of 15.25 mm. This presented the fact that the full strength solution was as equally effective as using ampicillin to treat Escherichia coli O157:H7, Shigella, and Salmonella enterica</p> <p><b>Conclusions/Discussion</b> When foodborne illness-causing bacteria were exposed to the full strength concentration of a turmeric solution, it inhibited bacterial growth effectively, therefore turmeric may be used as an antibiotic in the future.</p>	
<b>Summary Statement</b> I was able to create various concentrations of a turmeric solution that were applied to both diffusion disks and Vancocymn disks to see if they would inhibit gram-negative bacterial growth as effectively as ampicillin.	
<b>Help Received</b> Dr. Mahendra Poudel, MD, Salinas Valley Memorial Hospital; Mr. Donald Harris, BS in Microbiology, Salinas Valley Memorial Hospital; Ms. Kacee Fujinami, BS, Biology Teacher Salinas High School; Dr. Dharma Naidu, PharmD, Community Hospital of the Monterey Peninsula; Mrs. Wendy Naidu, RN, BSN.	