



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Arshia Anand</b>	<b>Project Number</b> <b>J1901</b>
<b>Project Title</b> <b>Antacids: Synthetic vs. Natural</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> Antacids are medicines taken to increase the pH of stomach acid to treat indigestion and heartburn (acid reflux). While they play an important role in balancing the pH of stomach acid, synthetic antacids contain chemical compounds that remain unabsorbed by the human body and cause harmful side effects when consumed over a long period of time. On the other hand, natural antacids may take longer to impact but have no side effects. This experiment was conducted to find out if natural antacids are as effective and efficient as synthetic antacids in treating acid reflux. The hypothesis stated that natural antacids will be as effective and efficient as synthetic antacids in increasing the pH of simulated gastric acid. There exist many natural antacids that have been proven to be effective, and none of the synthetic antacids being tested have a delayed reaction, so they should be just as efficient.</p> <p>In order to simulate stomach acid, a solution of potassium chloride, sodium chloride, and HCl was made creating a solution with a pH of 1. Two tablets of each antacid were diluted in the solution immediately after which the pH was measured. Then, the pH was to be measured again after 15 minutes, 30 minutes, and 60 minutes. Our hypothesis was not supported through experimental results. The findings were that the natural antacids barely increased the pH of the acid, but between the two natural antacids, Apple Cider Vinegar and Ginger Root, Ginger Root worked better. As for the synthetic antacids, Tums increased the pH too much, while Gaviscon was perfect at the start of each trial. Three of the antacids, Tums, Ginger Root, and Apple Cider Vinegar did not exhibit a change in pH over time, but Gaviscon did. In conclusion, natural antacids evaluated were not effective nor efficient, Tums is both the most effective and efficient, and Gaviscon is effective, but not efficient. Though Gaviscon takes longer to have an impact, it is better because it doesn't increase the pH of the acid too much like Tums does. Finally, natural antacids are not an effective substitute of synthetic antacids.</p> <p><b>Methods</b></p> <p><b>Materials-</b> Tums (calcium carbonate 500mg); Gaviscon (aluminum hydroxide 160 mg and magnesium carbonate 105 mg); HCl; Potassium Chloride; Sodium Chloride; Distilled Water; pH meter; Ginger Root capsules (organic ginger root powder 500mg); Apple Cider Vinegar capsules (apple cider vinegar 450mg); 4 100 mL beakers; 1 1 liter beaker; 1 glass stir; Goggles; Nitrile Gloves; Mask</p> <p><b>Procedures-</b></p>	
<b>Summary Statement</b> I found that natural antacids are not as effective as synthetic antacids in treating acid reflux.	
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