



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> Gary W. Berwick, III	<b>Project Number</b> <b>J0506</b>
<b>Project Title</b> <b>Masses of Gasses: What Veggies Create and Antacids Deflate</b>	
<b>Objectives/Goals</b> My project is based on the chemical reaction that is created when mixing acids (vinegar) and bases (baking soda) to create gas. After measuring the amount of gas produced by the control group, I added fresh, frozen, and canned vegetables at room temperature and then heated them to 68° C to measure which created the most gas. I then used Roloids, Tums, Gas-X, and Beano over-the-counter antacids to see which decreased the greatest amount of gas.	
<b>Abstract</b> I combined fresh, frozen, and canned vegetables in separate 2-liter bottles and added vinegar and baking soda to create a chemical reaction. Once the mixtures were combined, I put a latex balloon over each bottle to collect the gas that was created. From there I could measure the circumference of each balloon. Using specific formulas I calculated the volume of the balloons to measure the amount of gas created. I then repeated the steps but I heated the vegetables to 68° C to see if heating the vegetables would create a different reaction. The final steps involved repeating the procedures, but adding different antacids to see which would decrease the greatest amount of gas. The process was repeated three times for each sample.	
<b>Methods/Materials</b> I combined fresh, frozen, and canned vegetables in separate 2-liter bottles and added vinegar and baking soda to create a chemical reaction. Once the mixtures were combined, I put a latex balloon over each bottle to collect the gas that was created. From there I could measure the circumference of each balloon. Using specific formulas I calculated the volume of the balloons to measure the amount of gas created. I then repeated the steps but I heated the vegetables to 68° C to see if heating the vegetables would create a different reaction. The final steps involved repeating the procedures, but adding different antacids to see which would decrease the greatest amount of gas. The process was repeated three times for each sample.	
<b>Results</b> After more than 33 trials, the control group produced an average volume of 4845.4 cm <sup>3</sup> . The room temperature experiments showed that canned vegetables produced the most gas with a volume of 7415.1 cm <sup>3</sup> . The heated vegetables showed that fresh vegetables produced the most gas with an average volume of 6877.1 cm <sup>3</sup> . Once I added the antacids, the results showed that Gas-X reduced the most amount of gas with an average volume of 3476.5 cm <sup>3</sup> .	
<b>Conclusions/Discussion</b> After more than 33 trials, the control group produced an average volume of 4845.4 cm <sup>3</sup> . The room temperature experiments showed that canned vegetables produced the most gas with a volume of 7415.1 cm <sup>3</sup> . The heated vegetables showed that fresh vegetables produced the most gas with an average volume of 6877.1 cm <sup>3</sup> . Once I added the antacids, the results showed that Gas-X reduced the most amount of gas with an average volume of 3476.5 cm <sup>3</sup> .	
<b>Summary Statement</b> My project showed the overall analysis of mixing acids and bases with vegetables to produce gas in different temperature settings and the effectiveness of antacids in decreasing the chemical reaction of that gas.	
<b>Help Received</b> My mother helped me type my report.	