



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Stanton Y. Quan	Project Number S0522
Project Title Solubility of Different Calcium Pills in Varying Acidic Solutions	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to determine if there was a difference in the rate of dissolution of common, commercially available calcium pills.</p> <p>Methods/Materials Eight brands of calcium pills were tested in various solutions - water, 5% acetic acid (household vinegar) and acetic acid with three different amounts of sugar (carbohydrates). The percentage of the pill dissolved was calculated at one and two hours, the latter being the normal transit time through the stomach.</p> <p>Results While all pills dissolved to some degree, the rate of dissolution varied considerably among brands. Without exception, all pills dissolved more after two hours compared with one hour. Pills dissolved faster in a more acetic environment. With increasing amounts of sugar, the rates of dissolution slowed down proportionally. Among the subgroups of carbonates and citrates, there existed major differences in the rate of dissolution. One pill outperformed all others in solubility in every solution.</p> <p>Conclusions/Discussion For calcium pills to be utilized by the body, they first need to be dissolved. The findings of this experiment show that commonly available calcium pills dissolve at vastly different rates. The presence of carbohydrates further adversely affects the dissolution. The data suggests people taking "slower dissolving" brands may require higher doses to get the equivalent amount of calcium of the "faster dissolving" brands. Further studies more closely resembling a true stomach environment are needed to decide if dissolution is important to overall bioavailability.</p>	
Summary Statement The objective of this project is to test the dissolution of calcium pills in solutions designed to simulate stomach acid content.	
Help Received My dad helped me research the background information for the experiment. My mom explained and assisted me with the statistical analysis. My science teacher provided supervision of the project.	