



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Delaine A. Downie	Project Number J1107
Project Title Gel Capsule Solubility	
Objectives/Goals My objective was to find the average breakage rates of five different brands of common over-the-counter cold and cough liquid gelatin capsules. My hypothesis stated that I expected the brand Sudafed to have the fastest breakage rates. This project will benefit consumers because now they can get faster relief from their colds without relying on advertising claims.	
Abstract My project contained 500 gel capsules, 100 per brand. I conducted 20 tests, each with 5 capsules from each of the 5 brands. To simulate gastric juice I diluted Muratic acid 60 part water to one part acid. This formula makes the diluted acid roughly the pH of gastric juice. I used five glass baby food jars, each containing the same amount of diluted Muratic acid and one gel capsule, and I set a heater before the experiment to raise the temperature to about 72-75 degrees Fahrenheit because it was about 50 degrees Fahrenheit outside when I conducted my experiment. Finally, the data was recorded by waiting until the first and second capsule had burst. If it was a long time between the first and second capsule's breakage, then the first capsule most likely had a faulty casing. After all tests were completed, the data was averaged and made into graphs.	
Methods/Materials My project contained 500 gel capsules, 100 per brand. I conducted 20 tests, each with 5 capsules from each of the 5 brands. To simulate gastric juice I diluted Muratic acid 60 part water to one part acid. This formula makes the diluted acid roughly the pH of gastric juice. I used five glass baby food jars, each containing the same amount of diluted Muratic acid and one gel capsule, and I set a heater before the experiment to raise the temperature to about 72-75 degrees Fahrenheit because it was about 50 degrees Fahrenheit outside when I conducted my experiment. Finally, the data was recorded by waiting until the first and second capsule had burst. If it was a long time between the first and second capsule's breakage, then the first capsule most likely had a faulty casing. After all tests were completed, the data was averaged and made into graphs.	
Results The results disproved the experimenter's hypothesis. It was not Sudafed that had the fastest rate, but Sav-on, which changed its name to Equaline during the experiment. Sudafed actually had the second fastest rate. The brand that took the longest on average was Wal-Phed.	
Conclusions/Discussion I believe that the results turned out the way they did because of the varying thickness and hardness of the gelatin casing on the different brands of capsules. I found that the Equaline brand had a much softer casing than the Wal-phed brand.	
Summary Statement This Experiment is about testing and comparing the average solubility rates of the gelatin casing of five brands of over- the-counter cold and cough liquid gel capsule medication.	
Help Received Mother helped find resources for Review of Literature; Father poured and diluted Muratic acid and provided some of the materials for project.	