



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Cody L. Lim	Project Number J0409
Project Title Jello-Oh-No! The Effects of Fruits on the Denaturing of Peptide Bonds in Gelatin	
Abstract Objectives/Goals The objective is to determine what kinds of fruits, those with protease enzymes or those with only citric acid, can denature the most gelatin in 5 days. Methods/Materials Five-gram samples of kiwis, pineapples, papayas, oranges, strawberries, and lemons were placed in graduated cylinders with twenty milliliters of gelatin. There were four samples for each fruit. The effects of the fruit were recorded for five days. Results The fruits with protease enzymes and citric acid dissolved more gelatin than the fruits with only citric acid. Kiwi fruit, which has the protease actinidain and relatively high amounts of citric acid, consistently dissolved the most gelatin out of all six fruits, while the lemons, which have even higher amounts of citric acid but no protease, consistently denatured the lowest amount, actually making the gelatin expand. Conclusions/Discussion My conclusion is that protease enzymes are more effective than citric acid in breaking down peptide bonds. In the stomach, the enzyme pepsin works along with very strong gastric acid to digest food. But in my experiment, the citric acid (and ascorbic acid) had little effect. The protease fruit kiwi dissolved peptide bonds the fastest. The data suggests that people who eat kiwis along with protein would be able to break down more protein and get more amino acids, which are essential to life.	
Summary Statement My project tests the ability of fruits containing enzymes and/or acids to break down the peptide bonds in gelatin.	
Help Received Science teacher Ms. Buck gave me advice; Mother bought the fruit and gelatin; Father bought and helped cut up the construction paper for my board.	