



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Rebecca K. Shields	Project Number J0411
Project Title Jell-o or Gel-no: Which Fruits Contain a Protein-Digesting Enzyme that Prevents Gelatin from Solidifying?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This experiment was designed to test the hypothesis that food items containing a protein-digesting enzyme will prevent gelatin from solidifying. On a box of gelatin, it states "Do not add fresh or frozen pineapple, kiwi, mango, gingerroot, papaya, figs, or guava because the gelatin will not set". These fruits contain the protein-digesting enzymes papain or bromelain, which are also the active ingredients in meat tenderizers.</p> <p>Methods/Materials I prepared the gelatin according to the directions, making samples using the foods mentioned above, as well as fresh orange, banana, strawberries, canned pineapple, canned figs, canned guava juice, and two brands of meat tenderizer. I also tested plain gelatin as a control. I refrigerated the samples and checked the condition of the gelatin mixtures periodically for up to 24 hours. I repeated the entire test three times.</p> <p>Results These ingredients support my hypothesis: fresh pineapple, kiwi, gingerroot, McCormick's Meat Tenderizer, and Adolph's Meat Tenderizer. In addition, the gelatin samples that contained canned pineapple, canned figs, or canned guava juice solidified as expected because canning includes a heating process that eliminates the enzyme. However, some results were contrary to my hypothesis. Gelatin samples containing papaya and mango still solidified, even though they contain papain.</p> <p>Conclusions/Discussion Several food items containing papain or bromelain will prevent gelatin from solidifying. With the exception of fruits that have been canned, Jello should not be made with these foods. As a possible explanation of the contrary conclusions, I read that papain levels can vary with the ripeness of the fruit.</p>	
Summary Statement An enzyme in some foods can prevent gelatin from solidifying.	
Help Received Father helped print photos and graphs.	