



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Melissa A. Barcelona</b>	<b>Project Number</b> <b>S1401</b>
<b>Project Title</b> <b>The Effect of Different Enzymes on Protein Digestion</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective is to determine which plant digestive enzyme is most efficient in digesting proteins and from what source.</p> <p><b>Methods/Materials</b> Egg whites, the protein source, were cut and placed into 6 separate glass bottles. A positive control of egg white with 5 mL of pepsin, HCl, and H<sub>2</sub>O and a negative control of egg white with only H<sub>2</sub>O were used. The remaining bottles included the addition of either papain or bromelain from a capsule or fruit juice source. The egg whites were weighed after allowing 24 hours of digestion.</p> <p><b>Results</b> The papain capsule digested an average of 0.6 g protein more than the bromelain capsule. The papaya juice containing papain digested 0.2 g protein more than the pineapple juice containing bromelain. The papain enzyme digested 2.0 g of protein while the bromelain enzyme digested 1.6 g when averaging the capsule and fruit juices.</p> <p><b>Conclusions/Discussion</b> The bottle containing pepsin with no added enzymes digested the most protein. The papain capsule digested the most protein between the bottles containing added enzymes. Between papain and bromelain, there was no clear distinction on which enzyme is more efficient in digesting proteins.</p>	
<b>Summary Statement</b> This project compares the efficiency of adding different plant digestive enzymes to aid protein digestion in the human body.	
<b>Help Received</b> Teacher supplied most materials and taught basic laboratory techniques	