



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> <b>Robin Choudhury</b>	<b>Project Number</b> <b>J0506</b>
<b>Project Title</b> <b>How Do Cooking Techniques Affect Vitamin C?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective is to determine which cooking techniques [baking, boiling, steaming, and stir-fry] will retain the most vitamin C content. I thought steaming for a short period of time will result in the largest retention of vitamin C content. <b>Methods/Materials</b> I used broccoli, kiwi fruit, ascorbic acid, acetic acid, metaphosphoric acid, indophenol dye, vegetable oil and water. The lab wear used were aprons, latex gloves, and hat. The equipment I used were knife, weighing balance, beaker, graduated measuring cylinder, oven, wok, freezer, gas stove, temperature sensor, sieve, pestle and mortar, tubes, syringe filters, buret, pipet, volumetric flask, and a funnel. I steamed, stir-fried and boiled broccoli, and baked kiwi. To check the vitamin C content, I extracted vitamin C from food samples and titrated with indophenols dye. <b>Results</b> Stir-fry samples had the highest retention of vitamin C with an average loss of 1.2%, followed by steaming (12.3% loss of vitamin C content). The greatest loss of vitamin C was during boiling (63.1%). However, a significant loss of vitamin C was also observed during baking (40.8%). <b>Conclusions/Discussion</b> Stir-frying retained the most amount of vitamin C content, which did not support my hypothesis. The greatest loss of vitamin C (during boiling) may be due to loss of water-soluble vitamin C in boiling water. Steaming, compared to boiling, did not lose a large amount of vitamin C because the liquid water did not come in contact with the food samples. The destruction of vitamin C during baking may be due to the high heat in the oven. Stir-frying retained the most amount of vitamin C, because of minimum exposure to heat and water. Broccoli was stir-fried for a short period of time with a small amount of water, which vaporized during stir-frying. The initial frying in a small quantity of oil might have formed a small layer of oil on the outside surface of broccoli preventing leaching of vitamin C into water.	
<b>Summary Statement</b> This project's objective is to find the cooking technique that retains the most amount of vitamin C content in fruits and vegetables.	
<b>Help Received</b> Project advisor, Mom, Dad. Dr. Dennis Bacon, from California State University, Fresno, helped in preparation of chemicals.	