



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Maria D. Zumkeller	Project Number J0427
Project Title Investigating the Degradation of Vitamin C in Broccoli Utilizing Various Cooking Methods	
Objectives/Goals Determining which cooking method will retain the most Vitamin C in broccoli.	
Abstract Methods/Materials Dilute Lugols iodine 1:10 in distilled water for iodine titration solution. Make starch indicator solution by adding .5g starch to 50ml near boiling distilled water. Make vitamin C standard solution, dissolve Vitamin C tablet in 100ml distilled water. Pour into cylinder add distilled water. Titrate 25ml vitamin C standard solution. Use 25ml graduated cylinder to measure 20ml of vitamin C standard solution. Pour into 50ml flask Add 10 drops starch indicator solution. Set up buret and fill with iodine titration solution. Write down initial volume of iodine titration in buret. Place flask (containing vitamin C and starch solutions) under buret. Add iodine solution drop by drop. Swirl flask and tally number of drops. Titration is complete when iodine creates a blue-back color in solution that lasts longer than 20 seconds. Record final volume of iodine solution in buret. Repeat 4 times. Cook broccoli in desired method. Squeeze out broccoli juice and filter through cheesecloth. Put juice into clean 25ml graduated cylinder. Repeat the steps to titrating the vitamin C solution but substitute broccoli juice for vitamin C solution. Titration is complete when iodine creates distinct color change. Record the final volume of the iodine solution in the buret. Repeat 4 times. For each broccoli sample calculate the amount vitamin C using a proportion. Materials:30oz fresh broccoli,pot w/lid,bowl,measuring cups,wok,vegetable oil,cheesecloth,distilled water,250mg vitamin C tablets,funnel,lugols iodine solution,soluble starch,buret,stand,buret clamp,glass jar,flask.	
Results Stove top steaming method preserved the highest amount of vitamin C. Microwave steaming method preserved average amount of vitamin C. Stir-frying method preserved least amount of vitamin C.	
Conclusions/Discussion I found that my hypotheses were correct. My hypotheses stated that the stove top steaming method would preserve the highest amount of vitamin C, the microwave steaming method would preserve an average amount, and the stir frying method would preserve the least.	
Summary Statement Investigating which method of cooking broccoli will retain the most vitamin C.	
Help Received None	