



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Laura J. Billiter	Project Number S0404
Project Title Effect of Microwave Radiation on Chlorophyll	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to measure the effect of microwave radiation on the amount of chlorophyll a and chlorophyll b in spinach, lettuce, and bok choy extracts.</p> <p>Methods/Materials Chlorophyll was extracted from fresh spinach, lettuce, and bok choy leaves using the solvent acetone and the resulting solution was microwaved. The amount of chlorophyll a and chlorophyll b per extract was calculated both before and after microwaving using formulas from published journal articles, which required measuring the absorbance of each extract through a spectrophotometer at 662 nm and 645 nm. This procedure was repeated for three trials using 5 mL of chlorophyll extract per cuvette. A total of 10 samples were taken per vegetable, 5 of which were of the nonmicrowaved solution and 5 of which were samples of the same solution that had been microwaved for one minute.</p> <p>Results In trial 1, the amounts of chlorophyll a and chlorophyll b increased after microwaving the extracts of all three vegetables. In trial 2, the amount of chlorophyll b increased in all the vegetables except lettuce after microwaving the extracts; the amount of chlorophyll a increased in all the vegetables except for spinach. In trial 3, the amount of chlorophyll a increased in all the vegetables after microwaving except for spinach, while the amount of chlorophyll b dropped in all the vegetables. On average, the amount of chlorophyll a and b showed an increase after microwaving instead of the proposed decrease.</p> <p>Conclusions/Discussion My hypothesis was proved wrong, since neither chlorophyll a nor chlorophyll b showed a consistent decrease in amount after microwaving; the opposite happened to be true, although there were many discrepancies between trials. This can possibly be attributed to errors caused by the high volatility of acetone and perhaps to the insufficient time each extract was microwaved.</p>	
Summary Statement Measuring the effect of microwave radiation on the amount of chlorophyll a and chlorophyll b in different vegetable extracts.	
Help Received Borrowed equipment and instruments from AP Biology teacher; brother took pictures; parents provided acetone and vegetables.	