



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Julia C. Matthews</b>	<b>Project Number</b>  31902
<b>Project Title</b> <b>Absorbing Vitamin C, One Drop at a Time</b>	
<b>Objectives/Goals</b> My objective was to prove that vegetables grown in an ebb and flow hydroponics system obtain more vitamin c than those grown in a soil medium. <b>Abstract</b> <b>Methods/Materials</b> First, I built this system using twenty liter buckets, fiberglass screening, plastic tubing, and barbed connectors. I planted two spinach transplants in this system and watered them with Earth Juice nutrient solution, maintaining the solution at the ideal pH level for spinach, between 5.4-7.0. I planted two other spinach transplants in soil, and watered them with one liter tap water daily. All four plants were grown for five weeks. I ran a redox titration test on leaf samples from each plant to determine their vitamin c levels, using iodine and starch. I did a total of ten experiments, testing one leaf sample from each plant in each experiment ( a total of four leaves per experiment) <b>Results</b> My hypothesis was proved wrong. I found that the plants grown in a soil medium had about three times as much vitamin c as in the hydroponic plants. The hydroponic plants were also smaller, and less healthy than the soil grown plants. <b>Conclusions/Discussion</b> I conclude that my results were due to the way the nutrient solution was transferred to the plants in the ebb and flow system. It was inefficient because it did not give the roots enough time to absorb the necessary nutrients from the solution. I would like to try a different type of system, such as a drip hydroponics system, which may solve this problem.	
<b>Summary Statement</b> I grew spinach plants in a hydroponic system and tested their levels of vitamin c through a redox titration test, comparing them to spinach plants I grew in soil.	
<b>Help Received</b>	