



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

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<b>Project Title</b> The Effect of Aquaponics vs. Hydroponics on Plant Growth	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this project is to determine the effects of hydroponic systems and aquaponic systems on plant growth.</p> <p><b>Methods/Materials</b> Swiss chard seeds (30), green bean seeds (30), hydroponic system, aquaponic system, goldfish (8), 5 in 1 Test strips, ammonia test strips. Set up the two systems and planted sets of 10 plants in each. Measured growth, pH, ammonia, nitrate, and nitrite levels every two days for two weeks.</p> <p><b>Results</b> After two weeks, increased growth was measured in both types of plants in the aquaponic system versus the hydroponic system. Ammonia levels decreased in the aquaponic system whereas there was little ammonia found in the hydroponic system. Nitrate and nitrite levels were higher in the aquaponic system and remained consistent throughout experiment.</p> <p><b>Conclusions/Discussion</b> Based on the results, the increased plant growth from the aquaponic system is a result of the nitrogen products produced by the fish and circulated into the growth bed. Prior to adding the plants to the system, the ammonia level was higher but after a few days it decreased while at the same time the plants began increasing in height. This demonstrates the importance of nitrogen-based nutrients for plant growth. The experiment also demonstrates the effectiveness of aquaponic systems without the need for soils and added fertilizers. This experiment also demonstrated the overall conservation of water in growing plants in these systems.</p>	
<b>Summary Statement</b> I demonstrated the effectiveness of a aquaponic system versus a hydroponic system on plant growth.	
<b>Help Received</b> My father helped me build the aquaponic and hydroponic systems.	