



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Hannah J. Washburn	Project Number S2220
Project Title Symbiosis of <i>O. aureus</i> and <i>C. quadricarinatus</i> in an Aquaponic System	
Abstract Objectives/Goals The objective is to determine if <i>O. aureus</i> (Blue Tilapia) and <i>C. quadricarinatus</i> (Red Claw Crayfish) can be raised together to create protein diversity in an aquaponic system. Methods/Materials A recirculating tank with Blue Tilapia was used for the tilapia control. One tilapia was added to another tank for the independent variable. Red Claw Crayfish were separated into 2 groups, a control group of 11 crayfish and an independent variable group of 21 crayfish. The crayfish control group was put into a recirculating tank above the Blue Tilapia control group and the independent variable group was added to the tank with the 1 tilapia to test symbiosis. The first day of testing all tilapia and crayfish were weighed and the temperature of all 3 tanks was taken and documented. The tank temperatures were taken daily along with counting of the tilapia and the crayfish for the next 28 days. On the 29th day all remaining tilapia and crayfish were counted and weighed. Results After 28 days of monitoring, the control group of 10 Blue Tilapia had no losses. This group had an average biomass increase of 5.2 grams. The control group of Red Claw Crayfish had an average biomass increase of 9 grams. The control group had 4 crayfish die during testing; 3 of the crayfish bodies were intact and did not appear to have died from trauma. The symbiotic relationship between the test crayfish and tilapia sharing the same tank revealed that the tilapia had an increase of 15.8 grams in biomass while the crayfish suffered significant losses. During the testing period 13 crayfish died, all of the dead crayfish had missing legs and pincers or were in half suggesting that the crayfish were attacked and partially eaten by the tilapia. The tilapias considerable weight gain suggests that may have been the case. Conclusions/Discussion Widespread adaptation of aquaponics could potentially alleviate hunger by growing sustainable fruits, vegetables, and proteins year round, however the findings obtained in this study reveal that Blue Tilapia and Red Claw Crayfish can be sustained in an aquaponic environment but due to the predator/prey dynamic of their commensalistic relationship they would have to be separated.	
Summary Statement I'm trying to create diverse protein food source in a single aquaponic environment.	
Help Received Used the geodesic biodome at the City of Clovis Water Treatment Facility; Sisters took photos	