



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Natalie G. Helms	Project Number J1905
Project Title Chickens + Carotenoids = Quality Eggs?	
Abstract Objectives/Goals The objective of this experiment is to determine if adding fruits and vegetables rich in carotenoids to a chicken's normal, daily diet of egg layer feed it will improve the quality of the eggs. Methods/Materials Eggs from thirteen hens were collected for 25 days. The first four days were used as the control group. On day five carotenoid rich foods were added to their daily layer feed. Five hens received pumpkin and eight received spinach. Collected eggs were weighed in grams with the shell and without. Then each egg was cracked open into a white dish. The shade of the yolk was then determined by using a DSM Yolk Color Fan. Finally, the eggs were put into small disposable containers so they would not be wasted. Results Vegetables containing high levels of carotenoids were fed to laying hens to see if the quality of the eggs improved based on the yolk color. The group of chickens that were fed spinach had a beginning control yolk color of 6.5 (averaged). After feeding spinach for 14 days, the highest yolk color that was recorded was 12 (individual). The average increase in yolk color was 3 shades on the DSM Yolk Color Fan. The group of chickens that were fed pumpkin had a beginning control yolk color of 6.75 (averaged). After feeding pumpkin for 14 days, the highest yolk color that was recorded was also 12 (individual). The average increase in yolk color was also 3 shades on the DSM Yolk Color Fan. Conclusions/Discussion Based on data, research and testing it can be concluded that feeding chickens a supplement diet of carotenoid rich spinach and pumpkin can improve the quality of eggs. On the average the egg yolks increased in color by three shades on the DSM Yolk Color Fan. The chickens fed pumpkin scored between ten and twelve. The chickens fed spinach scored between nine and eleven. The quality of the egg has improved because of the increase in carotenoids. Studies have shown that supplementing the daily feed of egg-laying chickens with foods high in carotenoids increased egg yolk color and carotenoid contents. This means that the chicken deposits the nutritious carotenoids in the egg making them higher in quality.	
Summary Statement The objective is to determine if adding foods rich in carotenoids to the daily diet of a chicken will improve the quality of their eggs.	
Help Received Mom drove me to feed chickens. Friends let me use their chickens. Mom helped with typing.	