



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Andee L. Poole	Project Number S1813
Project Title Effect of Bovine Manure Age on Food Crop Productivity	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my science fair experiment is to investigate if aged bovine manure loses its nutrients and effectiveness as a plant fertilizer as it decomposes, or ages. The objective is to determine at what age, or level of decomposition, bovine manure should be used as a plant fertilizer based on its effectiveness as a fertilizer on radish plants, fescue grass, and alfalfa grass, three important, food producing crops grown in the Central Valley. Learning at what age the manure fertilizes plants best will allow farmers to use the most productive agricultural techniques to grow crops at the highest productivity rate possible.</p> <p>Methods/Materials Used bovine manure at three different levels of decomposition (180 days, 90 days, and 7 days) to hydroponically grow radish plants, fescue grass, and alfalfa grass over a fourteen day period. Compare the shoot biomasses (in grams) of the individual plants grown by the different manures to determine if bovine manure age affects food crop productivity based off of a statistical analyzation.</p> <p>Results The biomasses of different plants grown by bovine manure at varying levels of decomposition were compared. The results regarding the effects of bovine manure age on food crop productivity indicate that age did have an effect on the shoot biomass (in grams) on the three food crops. The manure aged 7 days was not as productive as the manure aged 90 days and 180 days. Although the manure aged 90 days and 180 days did have some significant comparable values, it was proven that the age of bovine manure does effect food crop productivity; thus the null hypothesis was rejected.</p> <p>Conclusions/Discussion The 7 day old manure was the least effective plant fertilizer, proven by the average shoot biomasses and the t-test that was calculated. The manure had a probability of less than 5%, so the results indicated a significant difference between the 7 day old manure and the older manures. The 90 day old manure was the best plant fertilizer. However, when the manures effectiveness on the fescue grass was compared with a t-test, there was no significant difference between the 90 day old and 180 day old manures. P = 99.34%, so random chance was not responsible for the results of the fescue grass# growth. In sum, bovine manure age did affect food crop productivity.</p>	
Summary Statement I proved that bovine manure age does affect food crop productivity on the shoot biomass (in grams) of radish plants, fescue grass, and alfalfa grass.	
Help Received Mr. Aalto explained the statistical analyzation to apply to the project.	