



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Andee L. Poole</b>	<b>Project Number</b> <b>S1812</b>
<b>Project Title</b> <b>Effect of Age on Primary Nutrient Content in Bovine Manure</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of my science fair experiment was to determine if aged bovine manure loses its nutrient levels and effectiveness as a plant fertilizer over time. I investigated at what age, or level of decomposition, bovine manure should be used as a plant fertilizer based on its effectiveness and the levels of potassium, nitrogen, and phosphorus it contains. If bovine manure can be used more effectively as a plant fertilizer, farmers will be able to use the most productive agricultural techniques. My hypotheses stated that the youngest manure (fresh) would contain the highest nutrient levels and as as the best plant fertilizer to radish seeds and fescue seeds. <b>Methods/Materials</b> 1.)Collect approximately 5 pounds of fresh manure while wearing gloves and place in a trough to age 6 months. 2.)Repeat Step 1 in 3 months and the day before the experiment. 3.)Place each age of manure in a black trash bag and let sit outside for 48 hours in a location with direct sunlight to evaporate moisture. 4.)Align six long trays with 15 9oz SOLO cups. 5.)Label each tray with the appropriate seed type and manure age. 6.)Plant radish seeds and fescue seeds hydroponically. 7.)Place 10 grams of small gravel in each cup. 8.)Mix 175mL of water and 10 grams of manure and place 5 grams of the mixture in each cup. 9.)Plant 1/2 gram of fescue seeds in appropriate cups and 20 radish seeds in appropriate cups. 10.)Cover cups with sealing wrap and let grow for 10 days. 11.)Remove shoots of plant from cups. 12.)Evaporate plants in an oven at 400 degrees for 2 hours. 13.)Measure the biomass. 14.)Use the Rapitest Soil Test Kit to measure the amounts of nitrogen, potassium, and phosphorus in the manure. 15.)Compare data. <b>Results</b> The oldest manure (6 months old) contained the highest levels of nitrogen, phosphorus, and potassium. The oldest manure also acted as the best plant fertilizer for the radish plant seeds. The middle- aged manure (3 months old) acted as the best plant fertilizer for the fescue grass seeds. <b>Conclusions/Discussion</b> Throughout my experiment, I learned the importance of testing soil samples in order to ensure the best planting environment for crops. My investigation portrayed that no matter the age of manure, manure has a surplus of nitrogen. I also learned that there is a relationship between nutrient abundances and effective fertilizers.	
<b>Summary Statement</b> It is an investigation to determine the nutrient levels and effectiveness as a plant fertilizer in manures at different levels of decomposition and determine any correspondences between the two.	
<b>Help Received</b> Used a scale at Sanger High School under the supervision of Mr. Aalto.	