



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

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**Project Title**  
**Can Algae Bloom Be Affected by Manure Produced from a Modified Chicken Diet?**

**Abstract**

**Objectives/Goals**  
The object is to test if manure produced by a feed modified chicken diet can reduce eutrophication effects on algal bloom.

**Methods/Materials**  
Experiment includes 50 test specimens; 10ea x 4 independent variables and 10 control group specimens. 30ml of Ankistrodesmus living algae will be placed in each of 50 individual 8oz plastic containers. Chicken excrement will be collected from backyard flock undergoing a diet modification study. 2g of manure will be placed onto an affixed filter then sprayed with 200ml of distilled water to create a 1% runoff water solution. 3ml of runoff water added to each specimen/variable. A spectrophotometer will be calibrated to 540 nanometers. 7ml of algae will be drawn from each specimen and placed into spectrophotometer. Readings will be taken on day 1 and every 2 days for 15 days.

**Results**  
Manure produced by a charcoal modified chicken diet had a 95.8%, protease enzyme modified chicken diet had a 93.7%, sodium bicarbonate modified chicken diet had a 94.2%, Non-modified modified chicken diet had a 95.4%, and the control had a 97.7% of light transmittance. The charcoal modification recorded the lowest algal growth.

**Conclusions/Discussion**  
Manure produced by the charcoal modified chicken feed shows promise in reducing the environmental impacts from farm operations. Charcoal as an amendment to chicken litter is currently being studied by the University of Georgia and has been shown to reduce ammonia, which is an air quality concern. Protease enzyme is used as a feed modification to increase bio-feed conversion rates, but did not show to have a positive effect on limiting algae bloom. This study indicates diet modification can reduce eutrophication effects on algae bloom.

**Summary Statement**  
Can manure produced by a feed modified chicken diet reduce the eutrophication effects on algal bloom?

**Help Received**  
Mr. Davin Aalto instructed me on the spectrophotometer.