



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Atticus J. Humphrey	Project Number S2308
Project Title Bromelain Feed Supplement: Effects on Feed Conversion Rates in Poultry	
Abstract Objectives/Goals The purpose of this project was to analyze if bromelain, which is an enzyme, has the ability to improve the feed conversion rates in Buff Orpington chickens. Methods/Materials The feed modification consisted of 0g bromelain for a control, a .5g concentration bromelain, and a 1.0g concentration of bromelain to feed modification. The test chickens were weighed once a week from the beginning of the study to the end of the study to track the chicken health and growth. Composite manure samples were tested for NO ₃ , P ₂ O ₅ , and K ₂ O every 2 weeks using a standard OSA1 lab analysis. The study itself lasted a total of 5 weeks. Results FCR results were: The control hens weighed 1228g, .5g bromelain had 1364g, and 1g bromelain had 1304g of total weight at the end of week 3 of the study. The pollution reduction results were: The control had 30.9lbs/ton of NO ₃ , 28.6lbs/ton of P ₂ O ₅ , and 19.6lbs/ton of K ₂ O. The .5g bromelain had 28.4lbs/ton of NO ₃ , 24.3lbs/ton of P ₂ O ₅ , and 17.7lbs/ton K ₂ O. The 1.0g bromelain had 33.7lbs/ton of NO ₃ , 24.5lbs/ton of P ₂ O ₅ , and 17.5lbs/ton of K ₂ O. Conclusions/Discussion After performing the study, the results showed that bromelain was both able to increase the chicken weight and reduce NO ₃ , P ₂ O ₅ , and K ₂ O. The .5g of bromelain showed the greatest observable weight gain overall. The .5g of bromelain also had the greatest reduction of the NO ₃ and the P ₂ O ₅ , while the 1.0g of bromelain was able to reduce K ₂ O. These results indicate that bromelain is a viable feed supplement when used to improve the FCR in chickens and also can reduce pollutants in the manure. By breaking down the proteins prior to digestion, the bromelain enabled the chicken to absorb more of the nutrients from the feed and waste less energy on digesting the feed itself. This consequently improved both the FCR of the chicken and decreased the pollution found in the manure.	
Summary Statement Need for food is increasing & clean water supplies decreasing, improving FCR in livestock by a feed modification such as bromelain is 1 tool farmers can use to increase animal efficiency and minimize pollution produced by farming operations.	
Help Received Mr. Aalto helped me to analyze my data and Mr. Fridlund gave me lab access.	