



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Cole T. Symanski	Project Number S1918
Project Title Egg-into-Egg: Effect of Dietary Protein on Clutch Traits in Zebra Finches	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Objective: My objective was to determine the effects of supplemental dietary protein on the traits of eggs laid by zebra finches, a species whose basic diet of grass seed is low in protein. I developed and tested five hypotheses regarding the effects of low- protein (seed) vs high-protein (seed plus supplemental protein) diets.</p> <p>Methods/Materials Materials and Methods: Two captive populations were used, each having 30 pairs of zebra finches. The populations were maintained under identical food conditions prior to the start of the experiment. One week before data collection began, the aviaries were randomly assigned to treatments. Birds in the low-protein treatment received grass seed, water, cuttlebone and oyster shell. Birds in the high-protein treatment were supplied hens egg and Cede in addition to the aforementioned basics. During the 24-day experimental interval, fresh eggs were collected daily from nests (and replaced by dummy eggs); then experimental eggs were weighed and marked for identification. Eggs were then frozen to facilitate separation of the yolk from the albumen upon subsequent dissection to obtain yolk weights. Clutch size and clutch start date were also recorded. After all data had been recorded, statistical analyses were performed using Systat.</p> <p>Results Results: For the most part, results were statistically significant and fit expectations. Eggs and yolks from the high-protein treatment weighed, respectively, about 6 and 8 percent more than those from the low-protein treatment. Clutch size was 50% greater in the high-protein treatment. There was no difference in the percent yolk of eggs in the two treatments. In the high-protein treatment, there was a positive correlation between total egg mass of a clutch and its start date, but for the low-protein treatment these variables were not significantly correlated.</p> <p>Conclusions/Discussion Discussion: Protein supplementation substantially increases egg traits and clutch size in zebra finches, which are typical seed-eating songbirds. This finding raises questions about how seed-eating birds evolved to provide sufficient protein for their embryos to develop; and how the protein level available to an embryo affects its ultimate survival and reproductive success.</p>	
Summary Statement I experimentally investigated the effects of supplementary protein on pre-embryonic reproductive traits in zebra finches.	
Help Received I used birds and lab equipment at University of California Irvine under the supervision of Dr. Nancy Burley.	