CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
S1912

Project Title
Diet, Development, and Immunocompetence in Adolescent Zebra Finches

Abstract

Objectives/Goals
The objective was to determine whether adding a protein supplement(boiled hens egg) to the diet of a granivorous species of bird while it was breeding would influence the development, body size, and/or immunocompetence of offspring.

Methods/Materials
Fourteen caged pairs of zebra finches (Taeniopygia guttata) were randomly assigned to breed on one of two treatments: a basic diet (grass seed, calcium, minerals, water) or a protein-supplemented diet (basic, plus daily allotments of hard-boiled egg). When offspring reached 60 days of age (mid-adolescence), they were tested for immunocompetence using the PHA test; body size (mass, and tarsus length); and maturity level (two measures of beak score: amount of black remaining, a juvenile trait, and degree of redness, an adult trait).

Results
Offspring of both sexes from the protein-supplemented treatment showed a stronger immune response compared to those reared on the basic diet. Protein-supplemented birds of both sexes also had less black on their beaks at 60 days of age. For the other measures (mass, tarsus length and beak redness), males from the protein-supplemented treatment had higher scores than males from the basic diet, but no treatment differences were observed for females.

Conclusions/Discussion
Reproductive performance of a granivorous species of bird is constrained by the low amount of protein (12 percent) in its diet; supplementation with egg protein improves immunocompetence, the rate at which young reach maturity, and body size, with effects being greater in males.

Summary Statement
I investigated the impact of increasing dietary protein on the reproductive performance of seed-eating birds and found that this supplement improved development rate and immunocompetence of offspring.

Help Received
I used birds and equipment at University of California, Irvine, under the supervision of Professor Nancy Burley.