



ScienceWatch – House Finch Adaptability 3: When Dad’s a Wimp Mom Fortifies Her Eggs

“For female birds an important aspect of parental investment is the resource allocated to eggs.”

The house finch (*Carpodacus mexicanus*) has spread across the United States due, in large part, to its adaptability. For example, in response to disease or pests female finches reduce chick mortality by controlling the laying order of their male and female eggs with differing doses of testosterone in the yolk – see – *ScienceWatch – House Finch Adaptability: Mother Knows Best!* (September 2002), and, *The First Shall Be Last and the Last Shall Be First* (October 2006).

Other female birds also endow their eggs with varying levels of growth-promoting hormones and vitamins. These compounds are costly to the female because they require energy for their manufacture, and it has long been thought that females will invest more in progeny sired by attractive, high quality males because the dividend of raising extra-healthy young is worth it. However, a report in the November/December 2006 issue of *Physiological and Biochemical Zoology* shows that house finches do the opposite. They fortify eggs sired by less attractive males, which gives the young a better chance at survival, and points to another reason for their great success.

Reproductive physiologist Kristen J. Navara of Ohio State University, Columbus, Ohio, and her colleagues measured levels of testosterone and antioxidants (vitamins A and E) in the yolks of fertilized eggs from 15 wild house finch nests. Male house finches display nutrition-based coloration varying from bright red to drab yellow. For each nesting pair, the team assessed male attractiveness by measuring the intensity of coloration on the head, breast and rump.

In contrast to results with other birds like zebra finches (*Taeniopygia guttata*), Navara, *et al.* found that females mated to drab, ugly males allocated more testosterone and antioxidants to their eggs than females mated to attractive males. In fact, eggs fertilized by unattractive males had approximately 2.5 times the level of vitamin E than those sired by attractive ones.

Higher levels of testosterone promote growth rates and make chicks more aggressive at food-begging, while extra antioxidants boost immune system activity by removing harmful free radicals. Thus, higher allocations of hormones and antioxidants could make up for mating with drab males who are poorer providers for their chicks than colorful males.

According to Navara, “for female birds an important aspect of parental investment is resource allocation to eggs.” House finches may use a strategy opposite to that of other

birds because they live relatively short lives—only one or two years. “They can only make one or two breeding attempts in a lifetime,” she says. Since all their eggs are in just one or two baskets, they will expend extra energy on supplements when dad is a wimp.

Saul Scheinbach