

## ABSTRACT

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Effects of methylmercury on reproduction in American kestrels and comparison to effects observed in other avian species

To assess the effects of methylmercury (MeHg) on the survival and reproduction of birds, several controlled-dose laboratory studies have been conducted over the years on a variety of avian species, but none of the previous studies measured reproductive effects in a flesh-eating species. In this study, breeding pairs of captive American kestrels (*Falco sparverius*) were exposed to 0, 0.75, 2.0, 3.2, 4.6, or 5.9 ppm MeHg dry weight in the diet and subsequent reproduction was measured. Egg production, incubation performance, and number of eggs hatched decreased markedly between 3.2 and 4.6 ppm MeHg dry weight in the diet. The percent of eggs hatched declined at doses above 0.75 ppm MeHg, with no eggs hatching at 5.9 ppm. Nestling survival and fledging success decreased in a dose-related manner for all treatments. Dietary concentrations of  $\geq 4.6$  ppm MeHg were associated with total fledging failure. Mercury concentrations in a set of 19 collected 'second' eggs were related to the reproductive responses of kestrels to dietary MeHg. Concentrations of Hg in eggs from the 5.9 ppm diet group (mean 19.1 ppm wet wt.) are higher than egg concentrations reported for wild birds, and higher than those from feeding studies using dry commercial food containing 5 ppm MeHg. The relationships between MeHg dietary exposure and reproductive effects observed in this study will be compared to effects observed in studies using other avian species with a goal of refining the effects characterization needed for population-level risk assessment. This abstract does not necessarily reflect EPA policy.