

Poster #11

Gonadotropin Induction of Testosterone Synthesis in Alligators from Contaminated and Uncontaminated Environments.

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Previous research on alligators living in Florida's Lake Apopka (contaminated with organochlorines) has shown that the males have reduced plasma testosterone levels compared to males from Lake Woodruff NWR (reference). However, in vitro incubations of alligator testes from the two lakes resulted in similar testosterone production. Therefore, we hypothesized that the observed testosterone reduction is due to decreased response to gonadotropin and/or changes in testosterone metabolism, and that this is a persistent deficiency initiated during embryogenesis. Seven juvenile male alligators from Apopka and eight from Woodruff were hatched in August 1995 and 1996. All animals were raised together in an outdoor pen in Gainesville. To induce steroidogenesis, we injected each animal with a superphysiological dose of ovine FSH (11.1 µg/kg). Blood samples were taken at 0, 0.5, 1, 2, 3, 6, 12, 24, 48, and 72 hours after injection. We repeated the process three times (March, May, and July) to bridge the breeding season. Plasma testosterone levels were measured using radioimmunoassay. All alligators responded to exogenous FSH by synthesizing increased levels of testosterone (P-value <0.0001 for all months). We found no significant difference in testosterone levels between lakes in July (p-value = 0.999, F-value = 0.076). However, in March and May, Woodruff alligators produced more testosterone than Apopka animals (in March: P-value = 0.060, in May: P-value = 0.078). In all months, there was remarkable variation in individual responses to FSH. We conclude that the known lake effect on testosterone levels early in the breeding season is due to events that occur at or downstream from the testis. In addition, it seems that the difference could be due to imprinting during embryogenesis.