

Embryonic exposure to 2,3,7,8-tetrachlorodibenzo-p-dioxin in chickens: effects of dose and embryonic stage on hatchability and growth.

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Abstract

Chicken embryos (*Gallus domesticus*) were injected with 0, 8, 20 or 50ng tetrachlorodibenzo-p-dioxin (TCDD) per egg at embryonic day (ED) 4, 8 or 12 to investigate the effects of differential periods of sensitivity to TCDD exposure. At hatch, all chicks were weighed, sexed and examined macroscopically to identify possible malformations. Liver, bursa, heart and spleen masses were recorded from a number of chicks. The remaining chicks were raised until 6 weeks of age and body and organ masses, plasma concentrations of thyroid hormones, triglycerides and glucose were measured. Dose and stage during embryonic development at which injection was performed affected hatchability. Fifty nanogram of TCDD was highly toxic for 4-day-old chicken embryos. TCDD was less toxic for chicken embryos of 8- and especially 12-days old. One-day-old chick and organ weights were not different between TCDD doses at all injection days. However, injection performed at ED4 or ED8 with 20 and 50 ng, respectively, significantly depressed post-hatch body mass gain. Moreover, body mass gain in males was more depressed than in females. The delayed growth in TCDD treated chickens was accompanied by changes in T(3)/T(4) ratio that at some ages were significantly higher compared to control animals. No pronounced changes in plasma triglycerides or glucose concentrations during postnatal life were observed. Absolute and relative organ masses of 6-week-old chickens showed no remarkable changes.