# Food Restriction During Pregnancy Alters Brain's Antioxidant Network in Dams and Their Offspring

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**Introduction**: Dietary restriction increases life span and protects distinct organisms against a series of diseases, among which, those related to oxidative stress. However, interferences in maternal environment reprogram the offspring metabolism response, impacting in the risk of chronic diseases development in adulthood. **Objectives:** Assess the effects of 40% food restriction on reactive species levels, enzymatic and non-enzymatic antioxidant defenses, and oxidative damage parameters in the cerebellum and total cerebral cortex of pregnant rats and their offspring. **Materials and methods:** Pregnant Wistar rats were divided into two groups: Control and Food Restriction (FR). FR group was submitted to a diet restriction of 40%, during entire pregnancy. Dams and their offspring were

euthanized by decapitation in the delivery day. Cerebellum and cerebral cortex were utilized in biochemical determinations: dichlorofluorescein (DCFH) oxidation, mitochondrial superoxide ($O_2^{\bullet-}$) and nitric oxide ($NO^{\bullet-}$) contents, activities of superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), and glutaredoxin (Grx); reduced glutathione; total reactive antioxidant potential; total antioxidant reactivity; Vitamin C; thiobarbituric acid reactive substances; malondialdehyde and carbonyl content. Data were analyzed using Student's *t* test and considered significant when $p<0.05$. Approved by UFRGS ethics commission. Number 25447. **Results and discussion:** DCFH oxidation was reduced in the cerebellum of dams and offspring, while the cerebral cortex was not affected. Decreased $O_2^{\bullet-}$ levels were found in both structures of pups. $NO^{\bullet-}$ was increased in cortex. SOD activity increased in cerebellum of dams and both structures of pups. It was decreased in dams' cerebral cortex. Both brain structures were affected concerning to CAT, GPx, and Grx activities (reduced in pups and dams). Non-enzymatic defenses decreased in pups, while dams showed adaptation in the cerebellum. Lipids and proteins were not affected. **Conclusions:** Our data suggest that intrauterine food restriction may disrupt oxidative status, impairing the antioxidant network.

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