

ANTIOXIDANT MICRONUTRIMENTS INSULIN-SENSITIVITY

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We recently demonstrated insulin resistance and oxidative stress in high fructose fed-rats, and that vitamin E improves their insulin sensitivity. To clarify the role of oxidative stress on insulin action, we evaluated the effects of high fructose diets containing antioxidant micronutriments (Zn, Se, Cu, Vitamin E, β carotene). Control groups received standard or high fructose diets (fructose: 55% of carbohydrates). Indicators of glucose metabolism (Insulin sensitivity by glucose clamp technique; plasma glycemia; triglycerides and fructosamine; liver glycogen) and antioxidant status (enzymes, micronutriments) were measured. The association of Zn (50mg/kg of diet), Se (150 μ g/kg), vitamin E (500mg/kg) and β carotene (50mg/kg diet) led to a 30% improvement of insulin sensitivity, lower plasma triglyceride ($p < 0.001$) and liver glycogen levels ($p < 0.001$). Furthermore, the ratio of reduced glutathione to oxidized glutathione was higher when insulin sensitivity was improved. Erythrocyte Se-GPX and Cu-Zn-SOD activities were also increased in rats receiving antioxidant micronutriments. This study confirms the link between insulin activity and antioxidant protection, opening new therapeutic perspectives for management of diabetes.