

**Supplementation with gliadin-combined plant superoxide
dismutase extract promotes antioxidant defences and protects
against oxidative stress.**

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Abstract

The potential benefits to health of antioxidant enzymes supplied either through dietary intake or supplementation is still a matter of controversy. The development of dietary delivery systems using wheat gliadin biopolymers as a natural carrier represents a new alternative. Combination of antioxidant enzymes with this natural carrier not only delayed their degradation (i.e. the superoxide dismutase, SOD) during the gastrointestinal digestive process, but also promoted, *in vivo*, the cellular defences by strengthening the antioxidant status. The effects of supplementation for 28 days with a standardized melon SOD extract either combined (Glisodin) or not with gliadin, were evaluated on various oxidative-stress biomarkers. As already described there was no change either in superoxide dismutase, catalase or glutathione peroxidase activities in blood circulation or in the liver following non-protected SOD supplementation. However, animals supplemented with Glisodin showed a significant elevation in circulated antioxidant enzymes activities, correlated with an increased resistance of red blood cells to oxidative stress-induced hemolysis. In the presence of Sin-1, a chemical donor of peroxynitrites, mitochondria from hepatocytes regularly underwent membrane depolarization as the primary biological event of the apoptosis cascade. Hepatocytes isolated from animals supplemented with Glisodin presented a delayed depolarization response and an enhanced resistance to oxidative stress-induced apoptosis. It is concluded that supplementation with gliadin-combined standardized melon SOD extract (Glisodin) promoted the cellular antioxidant status and protected against oxidative stress-induced cell death.