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**Cellular protection during oxidative stress: a potential role for D-ribose and antioxidants.**

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**Source**

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**Abstract**

A healthy cellular system involves the maintenance of an intracellular metabolic balance. Reactive oxygen species (ROS) are constantly produced as a normal product of cellular metabolism; however, during situations of cellular stress, these levels can increase dramatically with the potential to cause deleterious cellular structural and/or functional consequences. There is a significant elevation in these ROS following stressful situations, such as ischemia, hypoxia, high-intensity exercise, and in many diseases. To combat these ROS, neutralizing endogenous enzymes, as well as exogenous antioxidants, can aid in minimizing their potential untoward cellular effects. Exogenous reducing antioxidant agents, such as vitamin C and/or E, play a role in addressing these formed species; however, recent research has suggested that fruit seed extracts may provide additional cellular benefits beyond their antioxidant features. Furthermore, supplemental D-ribose enhances the recovery of high-energy phosphates following stress and appears to potentially offer additional benefits by reducing radical formation. Specifically, during periods of hypoxia/ischemia, supplemental D-ribose may play an inhibitory role in the breakdown of adenine nucleotides, influencing the subsequent formation of xanthine and uric acid compounds; and thereby affecting the release of superoxide anion radicals. The combination of D-ribose with reducing antioxidants may provide a more optimal state of cellular protection during and following times of oxidative stress.