

Role Of Free Radicals And Antioxidants On Sports Performance

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The increase in oxygen consumption during prolonged exercise leads to oxidative stress because of increased free radical production. Free radicals refer to reactive oxygen species (ROS) which are highly reactive due to an unpaired valence electron. Antioxidants are substances that scavenge free radicals and offer protection from the damaging effects of free radicals. Exercise-induced oxidative stress has been demonstrated in numerous studies. For instance, significant increases in F₂-isoprostanes and lipid hydroperoxides following exhaustive exercise indicate that prolonged strenuous exercise induces ROS production. Besides exercise, hyperthermia has also been shown to increase oxidative stress in vitro in animals. It has been postulated that free radicals might damage the sarcoplasmic reticulum resulting in reduced calcium release during the depolarisation phase of the muscle and consequently lead to decreased muscular performance. Hence, numerous studies have employed various antioxidants to investigate their effects on sports performance. There is evidence in the current literature on the positive effects of antioxidants (N-acetylcysteine, pycnogenol, quercetin and beetroot juice) on endurance performance. My co-researchers and I have also carried out several studies on the effects of various nutritional supplements with antioxidant properties on endurance performance in the heat. These supplements include palm vitamin E, caffeine, panax ginseng, Eurycoma Longifolia Jack (Tongkat Ali), honey and bee bread. Our findings have indicated that supplementation of palm vitamin E, Panax ginseng and Eurycoma Longifolia Jack did not seem to elicit any beneficial effects on endurance sports performance in the heat. However, more studies with higher dosages and duration of supplementation are warranted to corroborate these observations. On the other hand, we have demonstrated that caffeine, honey drink as well as bee bread may have ergogenic effect on endurance performance in the heat. Nevertheless, future studies are necessary to confirm these findings and to identify the precise underlying mechanisms for these effects.