

ANTIOXIDANTS: PROTECTION AGAINST FREE RADICALS

Active dogs, especially those that take part in endurance exercise, experience oxidative stress due to their prolonged increase in oxygen consumption. Antioxidants help minimize oxidative damage to cells during intense activity and following exercise during recovery.



Oxygen metabolism naturally generates free radicals, which are unstable particles that can injure cells and cause oxidative damage¹. Active dogs that are fed a diet with less than adequate antioxidants to offset natural free-radical production may not perform at their best, particularly with consecutive days of exercise. They also may suffer from muscle stiffness and disruption of cellular balance.

Dogs need a rich antioxidant blend to help support their immune system and protect cells from the cellular damage of free radicals. Antioxidant nutrients include selenium, zinc and vitamins A and E. These nutrients help support a dog's immune system to scavenge and clean up free radicals that can cause damage to cells. Purina Pro Plan's dry dog foods are enriched with these key nutrients to help promote a healthy antioxidant defense system.

To learn more about antioxidants and oxidative stress, check out the article referenced above as well as these scientific articles.

- Pan Y, Tavazzi I, Obeson JM, et al. Effect of Isoflavones, Conjugated Linoleic Acid and L-Carnitine on Weight Loss and Oxidative Stress in Overweight Dogs. Proceedings of the 2007 Nestlé Purina Nutrition Forum. St. Louis, MO.
- Waldron MK, Reynolds AJ, et al. Metabolomic Approach to Assessing the Efficacy of an Antioxidant Cocktail in Trained and Untrained Dogs Following an Exercise Bout. Proceedings of the 2006 Nestlé Purina Nutrition Forum. Lausanne, Switzerland. (Abstract)
- Reynolds AJ, Jackson J, Waldron MK. Comparison of Astaxanthin, Alpha-Tocopherol, and Placebo Treatment of Post-Exercise Indices of Oxidative Stress in Dogs. Proceedings of the 2006 Nestlé Purina Nutrition Forum. Lausanne, Switzerland. (Abstract)
- Reynolds AJ, Dunlap KL. Dietary Antioxidants and Exercise Stress in Dogs. Proceedings of the 2005 Nestlé Purina Nutrition Forum. St. Louis, MO.
- Willcox JK, Ash SL, Catignani GL. Antioxidants and Prevention of Chronic Disease. *Critical Reviews in Food Science and Nutrition*. (2004) DOI: 10.1080/10408690490468489.

¹ Hinchcliff KW, Reinhart GA, DiSilvestro R, Reynolds A, et al. Oxidant Stress in Sled Dogs Subjected to Repetitive Endurance Exercise. *American Journal of Veterinary Research*. 2000;61:512.