

**EFFECTS OF VITAMIN E AND SELENIUM SUPPLEMENTATION ON OXIDATIVE STRESS  
PARAMETERS AND DNA DAMAGES IN SHOW JUMPING EQUINES EXPOSED TO DIFFERENT  
SOURCES OF ATMOSPHERIC POLLUTION**

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**INTRODUCTION:** Air pollution results from environmental changes caused by the emission of gases (ozone - O<sub>3</sub> and nitrogen dioxide - NO<sub>2</sub>) that modify the composition of the air, affecting the health of humans and animals. Physical exercise increases respiratory rates and can then cause DNA damage and the formation of reactive oxygen species. Vitamin E and selenium supplementation can mitigate oxidative stress induced by high-intensity exercise (horse riding) in polluted environments.

**OBJECTIVES:** To evaluate the effects of vitamin E and selenium supplementation in show jumping horses exposed to different sources of air pollution, urban and peri-urban, on parameters of oxidative stress and DNA damage.

**MATERIALS AND METHODS:** Study with 20 horses in two groups: (1) Viamão – peri-urban area (N=10), with n=6 from the Conventional Diet subgroup and n=4 from the Supplemented Diet subgroup (Vitamin E and Selenium); (2) Porto Alegre – urban area (N=10), with n=5 from the Conventional Diet subgroup and n=5 from the Supplemented Diet subgroup. The concentrations of NO<sub>2</sub> and O<sub>3</sub> gases and meteorological conditions were evaluated monthly (one year). Markers of oxidative stress, binucleation (DNA), and clinical parameters were also evaluated.

**RESULTS:** There was dispersion of atmospheric pollutant gases (NO<sub>2</sub> and O<sub>3</sub>) in 2022 and 2023 in both regions. NO<sub>2</sub> gas was more relevant in Viamão and in the evaluation of oxidative stress, the supplemented subgroups of Viamão showed an increase in MDA (TBARS), being lower in relation to the non-supplemented subgroups of Porto Alegre (p = 0.027). For binucleation, the use of the supplement in the urban area (Porto Alegre) was able to reduce early cytogenetic damage (p = 0.002) in the post-evaluation. However, in the peri-urban area (Viamão), binucleation increased in the supplemented subgroup (it had no protective effect in the post-evaluation).

**CONCLUSION:** The study correlated air pollution with markers of oxidative stress and DNA damage in horses (higher NO<sub>2</sub> in Viamão and more prominent O<sub>3</sub> in Porto Alegre). Therefore, vitamin E and selenium supplementation prevented lipid peroxidation (peri-urban areas exposed to NO<sub>2</sub>), and provided partial protection against cytotoxic DNA damage.