The Effect of an Oral Antioxidant Supplement (RespirAid) on Plasma Vitamin C & E Concentrations in Mature and Aged Horses

Background
Vitamins C and E are important antioxidants in lung fluid and lung tissue\(^1\). Inflammation, caused by allergy (e.g. RAO) or infection (e.g. virus or bacteria) causes reduction in antioxidants which allows the inflammation to persist\(^2,3\). Supplementation with oral antioxidants has been shown to reduce airway inflammation and reduce clinical signs\(^4,5\). The aim of the present study was to determine the ability of an oral antioxidant supplement (RespirAid) to raise plasma vitamin C and E concentrations in horses. As older horses may experience higher levels of oxidative stress and have a higher requirement for antioxidant vitamins, both mature and aged groups of horses were studied.

Materials and Methods
Twenty aged horses (>20 years old) and 20 mature horses (<12 years old) were studied. Ten aged and 10 mature horses were fed RespirAid (delivering per day: 10g Vitamin C, 4000IU Vitamin E, 100mg Cu, 400mg Mn, 400mg Zn, 1mg Se) for 6 weeks. The remaining 10 aged and 10 mature horses were fed a placebo for 10 weeks. Blood samples for analysis of plasma Vitamin C and E concentration were collected every 2 weeks.

Results
Plasma Vitamin C and E concentrations were significantly increased in both the aged and mature groups of horses fed RespirAid [solid bars] after 2 weeks but were unchanged in the placebo fed group [open bars] (Figures 1 & 2). * = significantly different from Pre at P<0.001.

![Graph showing plasma vitamin C and E concentrations over time](image)

In the horses given the antioxidant supplement, plasma Vitamin C & E concentrations were the same in the aged and mature horses after supplementation, indicating that aged horses are comparable with mature horses in their ability to absorb antioxidants from the diet.

Conclusion
An oral antioxidant and key trace mineral supplement (RespirAid) is able to increase and maintain plasma Vitamin C & Vitamin E concentrations when fed to both mature and aged horses.