

Antioxidant restricted diet increases oxidative stress during acute exhaustive exercise

TA Watson¹, R Callister², R Taylor¹, D Sibbritt³, Lesley K. MacDonald-Wicks¹, ML Garg¹

¹*Nutrition & Dietetics, University of Newcastle, NSW, 2308*

²*Human Physiology, University of Newcastle, NSW, 2308*

³*Medical Practice and Population Health, University of Newcastle, NSW, 2308*

Background - Foods high in antioxidants are considered to play a major role in defending the body against oxidative stress during exercise.

Objective - To investigate the effects of short-term restriction of high-antioxidant foods on oxidative stress markers and antioxidant defences during acute exercise.

Design – Antioxidant rich foods were restricted in 17 athletes exercised to exhaustion and blood antioxidant and oxidative stress markers were examined. Participants followed habitual diets high in antioxidants prior to an initial exercise test and then followed a two-week restricted-antioxidant (R-AO) diet before a second exercise test. During both exercise tests blood samples were taken pre-exercise, post sub-maximal exercise, post exhaustion and with one hour recovery.

Outcomes - The R-AO diet reduced antioxidant intake 3-fold when compared to habitual-antioxidant (H-AO) intakes. F₂-isoprostanes (oxidative stress marker) was significantly increased following sub-maximal exercise (38%), exhaustive exercise (45%) and one hour recovery (31%) on the R-AO diet compared to the H-AO diet. F₂-isoprostanes during exercise when following the H-AO diet remained relative unchanged from rest. Total antioxidant capacity and circulating antioxidants were not significantly affected by the R-AO diet, but tended to be lower. Exercise performance was not affected by the R-AO diet.

Conclusions – Trained athletes may require higher intakes of exogenous antioxidants to defend against increased oxidative stress during exercise, which can be met through a diet rich in high antioxidant foods.