

This is a pre-copy-editing, author produced PDF of an article accepted for publication in *Medicine & Science in Sports & Exercise* following peer review. The definitive publisher-authenticated version - Easton, Chris, Merkett, Dylan, Stock, Chelsea and Grace, Fergal (2011) The effects of dietary nitrate supplementation on time trial performance in trained cyclists., *Medicine & Science in Sports & Exercise*, 2011, 43 (Supplement 1 5), S.593.is available online at http://journals.lww.com/acsm-msse/Fulltext/2011/05001/The_Effects_of_Dietary_Nitrate_Supplementation_on.2444.aspx

The Effects of Dietary Nitrate Supplementation on Time Trial Performance in Trained Cyclists.

C.Easton¹, D.Merkett¹, C.Stock¹, F.Grace².

¹Kingston University, Kingston upon Thames, England, ²University of the West of Scotland, Hamilton, Scotland.

Supplementation with nitrate-rich beetroot juice (BR) has been reported to lower resting blood pressure, reduce the oxygen cost (VO_2) of exercise and extend time to exhaustion during high-intensity steady state exercise (Bailey et al. *J Appl Physiol* 107: 1144-55). However, no study to date has investigated the effects of nitrate supplementation on self-paced exercise performance. **PURPOSE:** To determine the effects of BR supplementation on 16 km time trial performance in trained cyclists. **METHODS:** Eight male cyclists completed an exercise test to determine their ventilatory threshold (V_T) before receiving either 500 ml·day⁻¹ of BR or 500 ml·day⁻¹ of placebo (PL: blackcurrant cordial and water) for six consecutive days in a single-blind, randomised cross-over design. Subsequently, each participant completed 30 min of steady state cycling at 80% V_T followed immediately by a 16 km time trial. Respiratory variables, heart rate, blood [lactate] and [glucose] were collected at 5 min intervals during the steady state exercise. **RESULTS:** There were no differences in heart rate ($p=0.19$), [lactate] ($p=0.21$) or [glucose] ($p=0.28$) between conditions. VO_2 was significantly lower during the steady state exercise in the BR condition (2.2 ± 0.2 L/min) compared to the PL condition (2.4 ± 0.2 L/min, $p=0.04$). The time to complete the 16 km time trial was not different between experimental conditions (BR: 26.1 ± 2.2 min vs. PL: 25.8 ± 1.9 min, $p=0.34$). **CONCLUSIONS:** Consistent with previous research, dietary nitrate supplementation in the form of BR resulted in a significant reduction in VO_2 during steady state exercise. However, BR did not enhance self paced exercise performance in trained cyclists. Further research is required to identify the physiological mechanism underlying the action of dietary nitrate supplementation on exercise performance.