Mid Atlantic Regional Chapter
of the
American College of Sports Medicine

Annual Scientific Meeting, November 4th- 5th, 2017
Conference Proceedings
International Journal of Exercise Science, Issue 9, Volume 6

Beetroot Juice Supplementation Lowers Oxygen Cost of Vigorous Intensity Aerobic Exercise in Trained Endurance Athletes

Nathaniel S. Ashton[1], Erik Lind[1], Joanna L. Fiddler[2], Ryan E. Fiddler[1]. [1]Department of Kinesiology, State University of New York at Cortland, Cortland, NY, [2]Division of Nutritional Sciences, Cornell University, Ithaca, NY

Nitric oxide (NO) plays a critical role in regulating blood flow to skeletal muscle. NO production in humans is 1) oxygen-dependent via NO-synthases that convert L-arginine to NO and 2) oxygen-independent via the nitrate-nitrite-NO pathway. The latter can be augmented via beetroot juice supplementation (BR). **PURPOSE**: The purpose of this study was to investigate the effect of BR during vigorous intensity aerobic exercise. **METHODS**: Using a double-blind, repeated measures crossover design, 12 Division III collegiate distance runners (mean ± SD: age = 20.3 ± 1.1 yr; VO_2peak = 55.5 ± 8.1 ml·kg^{-1}·min^{-1}) consumed either 120 mL·day^{-1} of BR or placebo (PL) for 4 days. On day 5 of each 4-day supplementation period, subjects completed an exercise trial on a motorized treadmill consisting of five minutes of running at 65%, 85%, and 100% of volume of oxygen uptake reserve (VO_2R) separated by 2 minutes each. BR and PL supplementation protocols were separated by a 7-day washout period. Two-way repeated measures ANOVAs were used to determine the effect of treatment (BR or PL) and exercise intensity (65%, 85%, and 100% VO_2R) on VO_2, heart rate (HR), respiratory exchange ratio (RER), and rating of perceived exertion (RPE). **RESULTS**: There were no statistically significant interactions between treatment and exercise intensity for VO_2, HR, RER, or RPE. The main effect of treatment was not statistically significant for HR, p = 0.490; RER, p = 0.462; or RPE, p = 0.471. However, the main effect of treatment was statistically significant for VO_2, where BR (2.43±0.18 L·min^{-1}) was lower compared to PL (2.49±0.17 L·min^{-1}), p = 0.029. **CONCLUSIONS**: These results suggest that a 4-day protocol of 120 mL·day^{-1} of BR reduces VO_2 during vigorous intensity aerobic exercise in trained endurance athletes.