

The effects of nitrate-rich beetroot juice supplementation on nonverbal executive function in healthy recreationally active females

Chandler F. Riley, Alyssa Riley, Maya A. Hammer, Ryan Kenney, Katie Price, Courtney Merrill, Adam Pennell, Rachel Tan.

Nitrate-rich beetroot juice (BR) supplementation has been reported to preserve executive function (i.e. decision making and reaction time) before and after a simulated soccer match in recreationally active males, which may be due to enhanced cerebral blood flow. However, the literature examining the physiological response following BR ingestion in females is scarce, which hampers the extrapolation of results since physiological sex-differences may exist. Therefore, the purpose of this study was to assess if BR ingestion influenced executive function in an unfatigued and fatigued state in healthy recreationally active females. In a double-blind, randomized crossover design, 20 females consumed 140 mL of concentrated BR or nitrate-depleted placebo juice (PL) approximately 2.5 hours prior to each experimental visit. The Delis-Kaplan Executive Function (D-KEF) test, used for assessing higher-level cognitive function, was administered before and after completing a high-intensity intermittent running protocol. The D-KEF test involved 3 x 60-s conditions evaluating various cognitive tasks. A two-way repeated measures analysis of variance was conducted ($n=15$) and revealed no significant differences in executive function between PL (PRE: 15.27 ± 32.71 vs. POST: 16.93 ± 1.44) and BR (PRE: 15.80 ± 2.65 vs. POST: 16.60 ± 1.88). These preliminary data suggest that acute BR ingestion does not have an influence on processing and creative thinking of nonverbal executive function in an unfatigued or fatigued state in healthy recreationally active females, although importantly, the study is still in progress.

Keywords: beetroot, ergogenic aid, dietary nitrate, physiology, nitric oxide