# The effect of a single dose of beetroot juice on speed, strength, and power in healthy recreationally active females.

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Nitrate-rich beetroot juice (BR) improves muscle contraction which is relevant for intense intermittent-type sports. However, few studies have examined the effect of BR ingestion on performance using sport-specific exercise protocols. Moreover, there is a scarcity of research that include female participants which limits real world application given that females potentially have different responses to BR ingestion. The purpose of the present study was to examine the effect of BR supplementation on speed, acceleration, strength and power before and after fatigue in females. In a double-blind, randomized crossover design, 15 recreationally active females consumed BR and nitrate-depleted placebo juice (PL) ~2.5 hours prior to exercise testing. Measurements included 20 m sprint and acceleration using timing gates, strength using isokinetic handgrip dynamometry, and upper and lower body power using the medicine ball power throw and countermovement jump (CMJ) before and after a fatiguing running protocol. Data from a subset of participants ($n$=15) were analyzed and revealed no significant difference between PL and BR for 20 m speed and 10 m acceleration ($P$>0.05), isokinetic handgrip dynamometry (PL: PRE: 76±10 vs POST: 76±13; BR: PRE: 78±12 vs POST: 78±12 lb; $P$>0.05), medicine ball power throw (PL: PRE: 4.45±0.48 vs POST: 4.35±0.48; BR: PRE: 4.41±0.38 vs POST: 4.49±0.47 m; $P$>0.05) or CMJ (PL: PRE: 1.72±0.27 vs POST: 1.7±0.26; BR: PRE: 1.77±0.25 vs POST: 1.73±0.28 m; $P$>0.05). These results indicate that there are no effects of BR supplementation on exercise performance in female athletes; however, this study is currently underpowered, and research is still in progress.

Keywords: muscle, performance, nitrate, nitric oxide, physiology