

## Effects of acute nitrate supplementation on repeated sprint performance in collegiate soccer players

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**Background:** Acute (1.5-3 hours pre-exercise) dietary nitrate ( $\text{NO}_3$ ) has been shown to improve blood flow to active muscle tissue under hypoxic conditions (which occurs during repeated sprints). Additionally, multiday ( $\geq 3$  days) supplementation improves mitochondrial efficiency (less  $\text{O}_2$  is used to produce the same amount of ATP) and less ATP necessary for muscle contractions. Dietary  $\text{NO}_3$  improves ATP turnover, reduces PCr generation (less Pi), and improves type II force production, which can improve repeated sprint performance. The study aimed to determine the effect of acute  $\text{NO}_3$  supplementation on repeated sprint performance in trained collegiate athletes during field-based sprint tests.

**Methods:** A single-blinded, randomized crossover study was performed over one week on eight healthy collegiate male soccer players (ages  $21.1 \pm 1.4$  years). Participants completed a warm-up, a protocol consisting of 6x40m max sprints, followed by 30s active recovery. An electronic timing system was used. Immediately afterwards, subjects took 140mL of a placebo or a beet root juice (BRJ) shot. After 2 hours they performed the prior warm-up and sprint protocol.

**Results:** A trend towards significant condition effect (pre-to-post) was demonstrated for BRJ group in sprint time ( $p = 0.10$ ) with an average reduction of 0.3% ( $-0.017$ s), whereas placebo increased by 1.96% ( $+0.117$ s). Likewise, for overall

power ( $p = 0.06$ ) with an average increase of 1.5% ( $+9.68$  watts) for BRJ, whereas placebo decreased by 4.29% ( $-26.12$  watts). Also, a trend was discovered regarding a significant interaction effect for RPE during the trials ( $p = 0.08$ ), suggesting RPE decreased to a greater extent ( $-30.3\%$  or  $-2.1$  units) during the BRJ post trial versus placebo.

**Conclusions:** In summary, this study demonstrated a trend towards a significant effect in the enhancement of repeated sprint performance when acutely supplementing  $\text{NO}_3$  (800mg); mostly by improving sprint times, power output, and RPE in collegiate soccer players.

### Speaker Biography

Gloria Velasquez is a licensed dietitian with a Master of Science in Exercise and Nutrition Science from Tampa University, USA, as well as degrees in Nutrition from Long Island University in New York, De Leon University in Spain and Del Valle University in Guatemala. She published her research papers in Columbia and United States which was presented at the American College of Sports Medicine World Congress and at the International Society of Sports Nutrition Conference (ISSN). She is a graduate level professor at Mariano Galvez University in Guatemala for the master's program in Sports Nutrition and has worked as a Certified Sports Dietitian with the Autonomous Sports Confederation/Olympic Committee of Guatemala for the past 12 years. She is also the President and Director of the Organizing Committee for the ISSN annual conference in Guatemala.

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