

The Effects of Dietary Nitrate Supplementation as an Ergogenic Aid on NCAA Division Female Soccer Players

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Abstract:

Background: BeetElite is a common dietary nitrate (NO₃) supplement that is used by athletes to enhance performance and endurance while exercising by utilizing the nitrate-nitrite-nitric oxide (NO) pathway. NO, the reduced form of NO₃, acts as a vasodilator to enhance the oxygen-rich blood flow to muscles during exercise, thereby thought to improve endurance and athletic performance.

Objective: To test the validity of a single serving of BeetElite on the time trial performance of Division I female soccer players using the Yo-Yo Intermittent Running (Yo-Yo IR1) test.

Method: Twenty women from Pepperdine's Division I soccer team were used for the trial. The control test used apple juice as a supplement and the intervention used one serving of BeetElite (2 scoops BeetElite powder mixed with 4-6oz water). Post ingestion, the participants waited 30 minutes for the NO concentration to reach its peak level in the bloodstream. During this time, players filled out consent forms, a 24-hour recall, and a pre-test questionnaire including demographic questions. Heart rates and time trial performance were monitored. Following completion of the test, participants will fill out a subjective post-test questionnaire on test performance. A paired samples t-test ($p < 0.05$) was conducted post-test to determine the significance of supplementation on heart rate and time trial performance.

Results: A paired samples t-test revealed there was no significant difference in time trial performance pre- and post-supplementation, $t(8) = -0.462$, $p = 0.658$. Additionally, there was no statistically significant difference in the heart rate between trials, indicating supplementation did not significantly reduce heart rate, $t(15) = 1.401$, $p = 0.183$.

Conclusion: Currently there is inconclusive evidence regarding the effectiveness of beetroot juice supplementation on athletic performance. Supplementation success is dependent on the participant's current activity level. Future research should consider individual athletes activity level before testing athletic performance with beetroot juice supplementation.