

The Effects of a Beetroot Juice Supplement on 5k Running Performance in Collegiate Track Athletes: Beets to Beat the Best

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Background

Researchers proved that drinking beetroot juice (BRJ) improves the amount of time that a person can bicycle before becoming fatigued. The researchers theorized that the increase in cycle time was due to BRJ being high in nitrates and that this caused an increase of nitric oxide in the body (Bailey et. al, 2009). Researchers later found out exactly how this process works. The human body converts the nitrates that are in BRJ into nitric oxide. Nitric oxide dilates the blood vessels and allows more oxygenated blood to flow through the body. The increase in oxygen supplied to the muscles increases the ability to run at higher intensities for a longer amount of time (Ferreira & Behnke, 2010).



Purpose

This study is being performed to learn the effect of beetroot juice (BRJ) in collegiate 5 km track runners, and how the ingestion of BRJ will effect performance. Ingesting BRJ 2.5 hours before a 5 km run will increase 5 km run time, reduce heart rate and reduce submaximal VO_2 .



Methods

Each of the college track athletes were informed of the procedures of the study verbally and signed a written informed consent document. Five male collegiate track athletes reported to the Exercise Physiology Lab to perform a VO_2 Max test. VO_2 was measured with a Parvo TrueOne 2400 metabolic system. The participants wore a rubber mask that covered the nose and mouth, which was connected to the metabolic system to collect inspired and expired gases. Next, two submaximal treadmill trials were performed with the metabolic system. Exactly 2.5 hours before testing, participants ingested BRJ or a placebo. Each participant then performed the 5 km run at submaximal effort on the treadmill at 2% grade. Treadmill start speed was adjusted for each participant based on their season best 5 km times. Due to the lack of environmental variables during treadmill running, a pace chart was used to convert race speed to treadmill speed and treadmill grade was set at 2%. Each participant was allowed to change the pace as they chose and these changes were recorded. Total run time, heart rate (HR), and VO_2 levels were recorded.

Preliminary Results

Participant Characteristics	M \pm SD
Age (years)	19.6 \pm 11.0
Weight (kg)	69.4 \pm 5.2
Height (cm)	177.2 \pm 3.5
VO_2 Max ($ml \cdot kg^{-1} \cdot min^{-1}$)	72.3 \pm 10.2

Participants	VO_2	Time	Heart Rate
1 (with BRJ)	55.4 \pm 2.4	19:03	174.0 \pm 6.7
2 (with BRJ)	66.1 \pm 2.2	18:45	193.7 \pm 2.5
3 (without BRJ)	53.9 \pm 3.6	21:51	182.2 \pm 9.2
4 (with BRJ)	63.3 \pm 2.3	18:57	179.8 \pm 4.8