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EFFECTS OF SINGLE-DOSE DIETARY NITRATE ON OXYGEN CONSUMPTION DURING AND AFTER PROLONGED SUBMAXIMAL EXERCISE IN HEALTHY HUMANS

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INTRODUCTION

• Oxygen is the substrate for aerobic metabolism; with exercise, oxygen consumption (VO₂) will increase to provide the substrate for energy production. As VO₂ increases, energy expenditure (Kcal) also increases.
• As exercise begins, the amount of O₂ needed increases faster than the body can increase its uptake. At cessation of exercise, the body continues to maintain an elevated VO₂ rate to make up for the deficit. This continued elevated intake is referred to as excess post-exercise oxygen consumption (EPOC).
• Dietary nitrate supplementation has been shown to decrease VO₂ at a given workload², increase performance in time trial³, and decrease diastolic blood pressure⁴. However, there is a lack of published data regarding the effect of nitrate supplementation on EPOC.
• Therefore, we tested the hypothesis that acute nitrate supplementation in the form of beetroot juice will significantly decrease excess post-exercise oxygen consumption (EPOC).

METHODS

Subjects, Instrumentation and Measurements
- A total of 7 healthy, untrained, young males aged 21-31
- Parvo Medica TrueOne 2400 Metabolic Cart
- Heart rate (HR) determined by ECG
- Blood pressure (BP) measured with automatic sphygmomanometer
- RPE measured on 6-20 Borg Scale

Control Condition
- 70 ml mouthwash
- prevent conversion from NO to NO3

Nitrate Supplementation
- 70 ml Beet It Sport Shot (BIS)
- administered orally

Cycle Ergometry
- 5 experimental visits
- Maximal Exercise (Control)
- Maximal Exercise (BIS)
- Prolonged (45 min) Submaximal (% of Ctrl Max) (Control)
- Prolonged (45 min) Submaximal (% of Ctrl Max) (BIS)

Experimental Protocol

Subject Population and Number

PRELIMINARY DATA

The collective data derived from the present investigation fails to provide evidence to support our hypothesis that nitrate supplementation will significantly decrease EPOC. While further tests must be conducted to reaffirm the results, preliminary data suggest that at a given submaximal workload, VO₂ and EPOC are not lowered. If the results are confirmed, this could impact the growing use of the supplement as an ergogenic aid in sport performance.

REFERENCES