

# Nitrate supplementation and elite sport performance

No registrations found.

<b>Ethical review</b>	Positive opinion
<b>Status</b>	Recruiting
<b>Health condition type</b>	-
<b>Study type</b>	Interventional

## Summary

### ID

NL-OMON21945

### Source

NTR

### Brief title

NO-who

### Health condition

- performance / prestatie
- elite athlete / topsporter
- nitrate / nitraat
- supplementation / suppletie

## Sponsors and support

**Primary sponsor:** Maastricht University, Human Movement Sciences / HAN University of Applied Sciences, Institute of Sport and Movement

**Source(s) of monetary or material Support:** Supported by a grant from the Dutch Technology Foundation STW

## Intervention

## Outcome measures

### Primary outcome

Performance based on sport specific testing (depending on sport discipline and performance test; measured as time to completion, total distance covered or power output).  
The target sample size of 122 is an estimation based on the total number of athletes needed to be screened for all five sub studies to be able to detect significant performance improvement.

### **Secondary outcome**

- Plasma nitrite
- Plasma nitrate
- Heart rate

## **Study description**

### **Background summary**

The main objective of the current study is to assess the impact of nitrate supplementation on sports performance in elite athletes. The study will be conducted in a randomized crossover manner, consisting of two intervention periods of 6 days (either nitrate-rich beetroot juice or nitrate-depleted placebo beetroot juice). This will be investigated in five different sub studies:

Sub study A: The effect of dietary nitrate supplementation on elite team sport performance

Sub study B: The effect of dietary nitrate supplementation on elite high-intensity cycling performance

Sub study C: The effect of dietary nitrate supplementation on elite rowing performance

Sub study D: The effect of dietary nitrate supplementation on elite swimming performance

Sub study E: The effect of dietary nitrate supplementation on elite badminton performance

The difference in performance between the nitrate and placebo intervention will be investigated.

### **Study objective**

Dietary nitrate supplementation enhances exercise performance of elite athletes competing in intermittent and high-intensity sport disciplines.

## Study design

Subjects participate in a screening session, a familiarization test (to practice the performance test), and two test days. During the test days blood samples will be taken twice (at baseline and 2.5 h following ingestion of the last nitrate supplement) and the performance test is conducted approximately 3 h following the last supplementation bolus.

## Intervention

The study consists of five sub studies, all applying the same intervention. The intervention comprises two 6-day supplementation periods either with 140 ml concentrated beetroot juice (containing 800 mg NO<sub>3</sub>) or 140 ml placebo beetroot juice (nitrate-depleted), supplemented in a randomized crossover manner. The interventions will be separated by a wash-out period of at least 1 week. Sport specific exercise performance tests will be conducted after each 6-day supplementation period. The performance test will be different for the five different sub studies;

A. YoYo IRT for team sports (or other team sport specific performance test); the subjects perform an time to exhaustion test consisting of 2x 20 m shuttles at increasing speed, interfered by a 10 s recovery period between each shuttle. The subject runs until he/she cannot perform the shuttle within the given time, and the total distance covered is the performance outcome.

B: Wingate cycling test; a 30 s all out cycling sprint for short high-intensity sport disciplines (i.e. track cycling, short track ice skating). The performance outcome is the peak and average power output.

C: Rowing ergometer performance test; a 2000 m time trial on a slide II rowing ergometer. The performance outcomes are time to completion and power output.

D: Swimming performance test; a swimming step test consisting of 5x 200 m swimming at increasing intensity. The performance outcomes are time to complete each 200 m and each 100 m split time.

E: Badminton specific performance test; a change-of-direction speed test performed four times. The performance outcome is the average time to completion of the two best runs.

Amendment 12-okt-2016: Concentrated beetrootjuice (both nitrate-rich and placebo) will be used as supplement (not natriumnitrate)

## Contacts

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## Eligibility criteria

### Inclusion criteria

- Healthy and free from injury/sickness
- Athletes of a Dutch national or elite selection of intermittent (team sport) and high-intensity sport disciplines (different disciplines will be investigated in sub studies)
- Males and females
- 18-40 years

### Exclusion criteria

- Use of medication which can influence test performance or blood analysis (e.g. vasodilators, blood thinners, bronchoconstrictors)
- Injury inhibiting the athlete from performing the exercise protocol efficiently
- Smoking
- Chronic use of nitrate supplements

## Study design

### Design

Study type:	Interventional
Intervention model:	Crossover
Allocation:	Randomized controlled trial
Masking:	Double blinded (masking used)
Control:	Placebo

### Recruitment

NL	
Recruitment status:	Recruiting
Start date (anticipated):	10-02-2015
Enrollment:	122
Type:	Anticipated

### IPD sharing statement

**Plan to share IPD:** Undecided

## Ethics review

Positive opinion	
Date:	09-02-2015
Application type:	First submission

## Study registrations

### Followed up by the following (possibly more current) registration

No registrations found.

## Other (possibly less up-to-date) registrations in this register

No registrations found.

## In other registers

Register	ID
NTR-new	NL4854
NTR-old	NTR4970
Other	NL50660.091.14 : 2014-1284

## Study results

### Summary results

N/A