

# Introductie van Marathon-4 project:

**“Effectiviteit van voedingsadvies voor sporters: nitraatspiegels op basis van groenteconsumptie als biomarker voor effectiviteit van dieetadvies.”**

Floris Wardenaar, WP3 coordinator

# Introduction

- Vegetable intake in the Dutch population remains low or inadequate.
- ~5% of the Dutch population reaches recommendation of 200 grams/ day
- Nitrate as essential substance for health and performance?
  - nitrate carriers as part of nutritional supplements
  - dietary intake as the easiest en most cost effective way?
- Mechanistic investigation on dietary intake:
  - increased nitrogen availability;
  - lower oxygen requirements;
  - greater performance;
  - lower blood pressure and cardiovascular complications
- PhD project with focus on:
  - efficacy of nitrate
  - effect of dietary counselling on nitrate consumption and health and performance outcomes

# Protective effect of dietary nitrate on development of hypertension

## Consumption of nitrate-containing vegetables is inversely associated with hypertension in adults: a prospective investigation from the Tehran Lipid and Glucose Study

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### Abstract

**Background** There is growing evidence of the potential properties of nitrate-rich foods against development of hypertension (HTN) and vascular disease. In this study, we investigated the association of nitrate-containing vegetables (NCVs) with risk of HTN after 3 years of follow-up. **Methods** This prospective study was conducted on 1546 non-hypertensive subjects, aged 20–70 years. Blood pressure was measured at baseline and after 3 years and HTN was defined by the Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure criteria. Dietary intake was collected using a validated semi-quantitative food frequency questionnaire

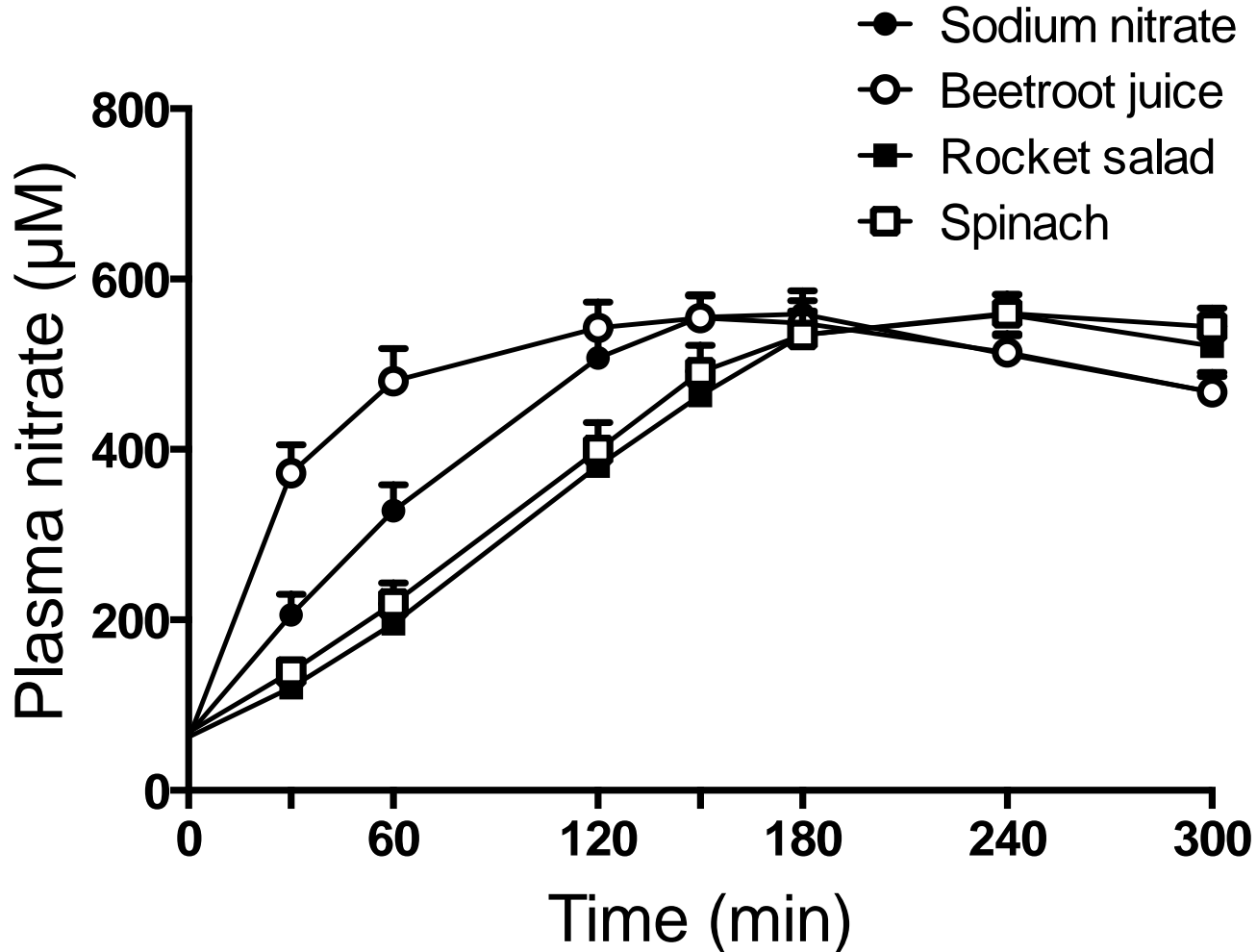
(FFQ). NCVs and high-, medium- and low-NCV subcategories were defined, and the odds of HTN after 3 years according to tertiles of NCV and NCV-category intake were estimated by logistic regression and adjusted for potential variables.

**Results** Mean age of participants was  $38.0 \pm 12.0$  years at baseline and 57.0 % were women. Mean dietary intake of energy-adjusted NCV was  $298.0 \pm 177.3$  g/day. After adjustment for total energy intake, fiber, sodium, potassium and processed meat, a significant inverse association was observed between NCV and the risk of HTN in the highest tertile category (odds ratio 0.63, 95 % confidence interval: 0.41–0.98,  $p$  for trend = 0.05). There was no significant association of 3 year risk of HTN across tertiles of low nitrate-, medium nitrate- and high-nitrate vegetables.

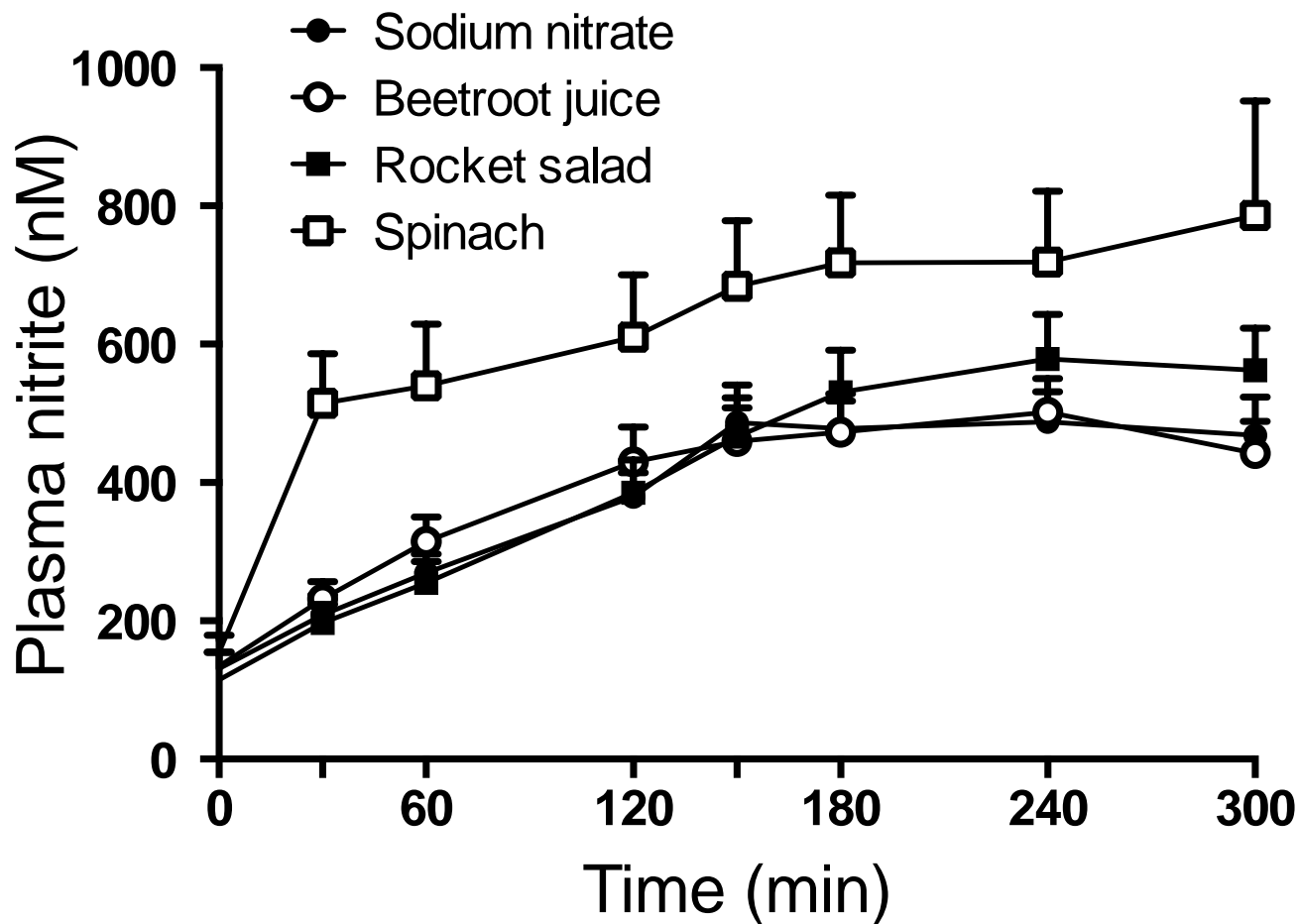
**Conclusion** Higher dietary nitrate intake from vegetables sources may have a protective effect against development of HTN.

**Keywords** Hypertension · Nitrate · Fruits and vegetables · Blood pressure

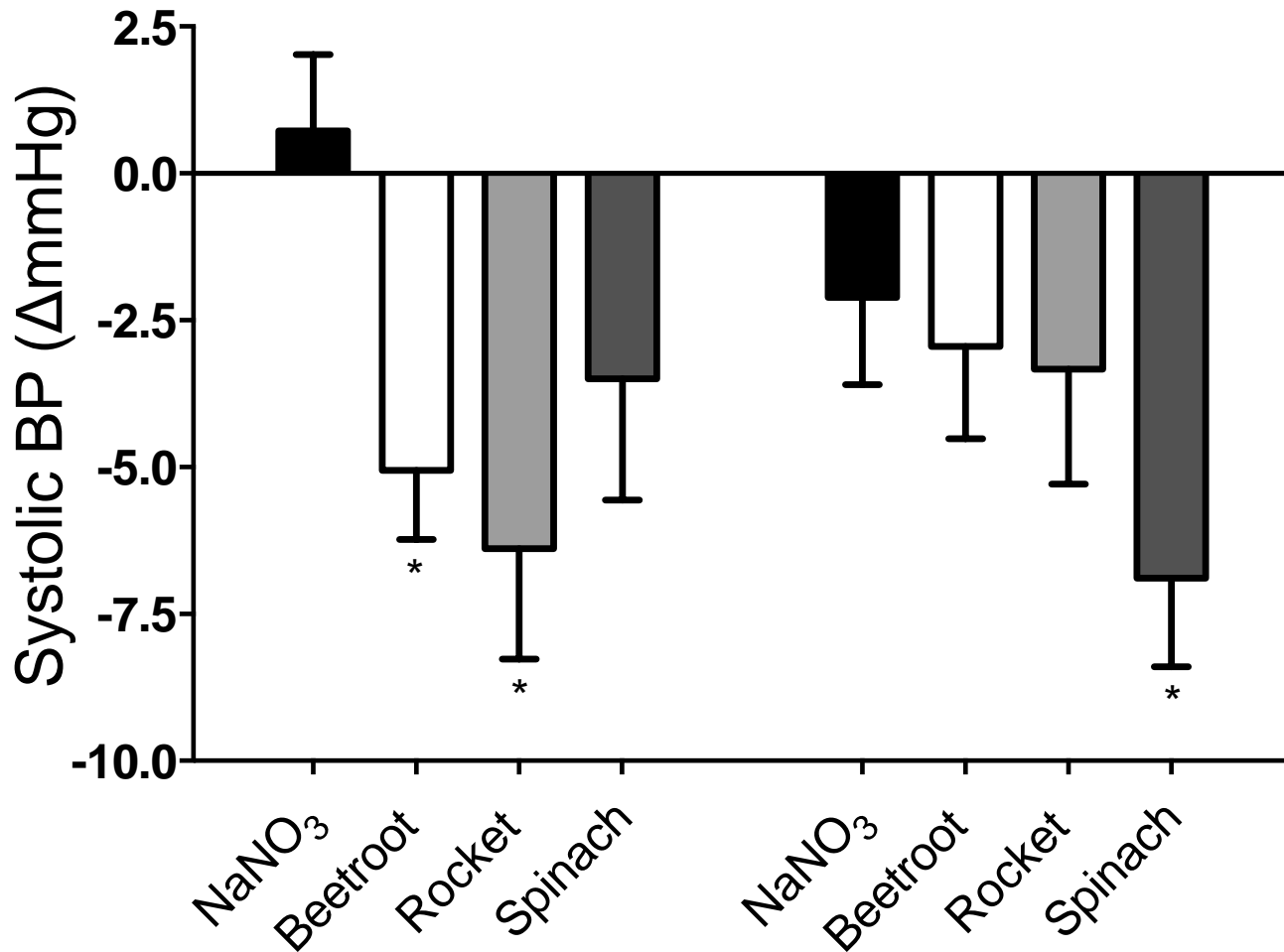
# Plasma nitrate concentrations



# Plasma nitrite concentrations



# Change in systolic blood pressure



Treatment x time:  $P=0.02$

# PhD position at HAN Sport en Bewegen

in cooperation with RU, WU and other Eat2Move partners 2016-2020



## Promoters

Prof. Dr Maria Hopman  
Prof. Dr Luc van Loon

# Objective

- To evaluate the efficacy of dietary counseling to increase the intake of vegetables to increase functional components (notably nitrate and nitrite)
- To evaluate the impact of increasing (green leafy) vegetable intake and nutritional supplementation (for example as a beetroot juice concentrate)
- To evaluate the divergence in the efficacy of dietary manipulation (increasing intake vegetables) and nutritional supplementation to increase functional components (notably nitrate and nitrite) availability



# Activities

- Intervention in:
  - young adult athletes, on oxygen kinetics and performance.
  - middle age sedentary subjects, on blood pressure.
  - older subjects , on blood pressure and cognitive function.
  - Intervention in athletes, sedentary subjects, middle aged or older subjects (regular daily dietary counseling versus standardized controlled (lab) situation).
- With:
  - control (A), green leafy vegetables (B), nutritional supplementation (C; incl. beetroot)

# Possibilities to participate

- From different perspectives, some ideas:
  - Nutritional needs
  - intermediate biomarkers: for example vascular quality
  - Monitoring (apps for stimulating healthy choices, field testing)
  - E-health (tools for blood pressure, cognition, performance)
  - Product development
  - Lifestyle programs and marketing tools
  - Product related interest (nitrate rich products: potato, drinking water)
  - Regional initiatives or euregional initiatives
  - Agricultural interest

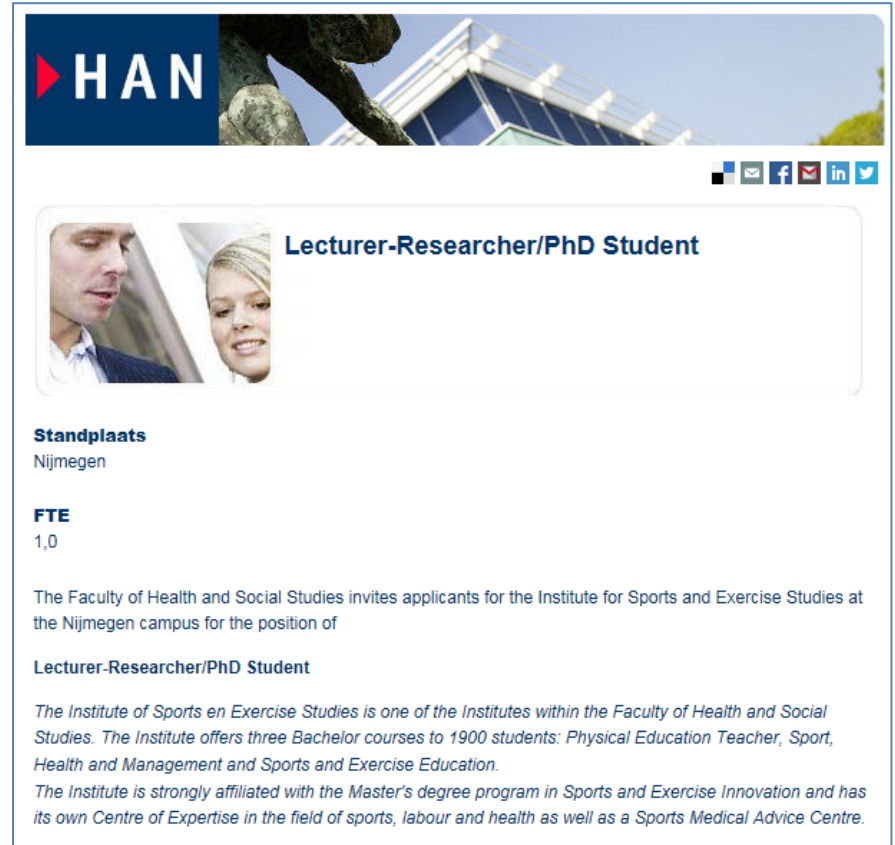
# Questions?

About applying for a PhD?  
About contribution or partnership  
in this project?

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About general issues, getting involved  
in WP3?

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The screenshot shows a job advertisement for a Lecturer-Researcher/PhD Student at HAN University of Applied Sciences. The advertisement includes the HAN logo, a photo of a man and a woman, and the following text:

**Standplaats**  
Nijmegen

**FTE**  
1,0

The Faculty of Health and Social Studies invites applicants for the Institute for Sports and Exercise Studies at the Nijmegen campus for the position of

**Lecturer-Researcher/PhD Student**

*The Institute of Sports en Exercise Studies is one of the Institutes within the Faculty of Health and Social Studies. The Institute offers three Bachelor courses to 1900 students: Physical Education Teacher, Sport, Health and Management and Sports and Exercise Education.*

*The Institute is strongly affiliated with the Master's degree program in Sports and Exercise Innovation and has its own Centre of Expertise in the field of sports, labour and health as well as a Sports Medical Advice Centre.*