The impact of timed protein supplementation to maximize the skeletal muscle adaptive response with endurance exercise training in young healthy men

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This study aims to examine the effects of timed protein supplementation on the endurance-based exercise training-induced changes in VO2max.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON45535

Source
ToetsingOnline

Brief title
Protein supplementation and the skeletal muscle adaptive response

Condition

- Other condition

Synonym
Not applicable

Health condition

Effect van duurtraining met eiwitsuppletie op spier en bloed

Research involving
Human

Sponsors and support

Primary sponsor: Wageningen Universiteit
Source(s) of monetary or material Support: Ministerie van OC&W,Friesland Nutrition

Intervention

Keyword: Adaptation, Endurance, Muscle, Protein

Outcome measures

Primary outcome

VO2max

Secondary outcome

10-km time trial

Muscle Fiber Adaptations

capillary density

gene expression

phosphorylation proteins

mitochondrial mass

Cytochrome synthesis activity

blood parameters

body Composition

waist circumference

body weight

BMI

Study description

Background summary

Regular endurance training improves oxygen uptake and transport, and ultimately results in a better use of oxygen by the active muscles. Nutrition plays an important role before, during and after exercise. Carbohydrates are best known for the role they play in the rapid release of energy during exercise, protein is mainly known for its role in muscle recovery after exercise. Previous research has shown that protein supplementation optimizes the recovery of strength training resulting in bigger en stronger muscles. For endurance training, however, it is currently unclear whether protein supplementation does improve adaptation over a longer period.

Study objective

This study aims to examine the effects of timed protein supplementation on the endurance-based exercise training-induced changes in VO2max.

Study design

This study will be a double blind, randomized, placebo-controlled intervention trial. The total study consists of a screening and an experimental part in which we will focus on the effects of an exercise intervention program with nutritional support on VO2max, in untrained healthy young men.

Intervention

Three times a week endurance training, for a total period of 12 weeks. The exercise sessions in week 6 and 12 will be replaced by other exercise tests.

The training sessions last for 30 up to 60 minutes (alternated)

Group Intervention: protein supplement (30 g protein). After training and before bedtime.

Placebo Group: carbohydrate supplement (30 g carbohydrate). After training and before bedtime.

Study burden and risks

Maximal exercise testing: exercise testing can lead to muscle soreness. This is harmless and disappear away after a few days.

Blood collection: despite the blood is taken with great care and is conducted

by an experienced nurse, it is possible that the puncture created a bruise. These disappear after a few days.

Muscle biopsy: a muscle biopsy is a small procedure in which a small piece of muscle is removed from the thigh. In total there will be 100-150 mg muscle tissue be removed per muscle biopsy. The muscle biopsy is taken from the right thigh. The skin and the underlying tissue are locally anesthetized. After this, a small incision (0.5 cm) will be made in the skin and the muscle sheath. Through this slice of a hollow needle is inserted with which a few chunks of muscle to be disconnected. After taking the muscle biopsy the wound edges are closed with a sterile bandage and a pressure bandage to minimize the chance of bleeding. The incision will heal completely, but, in some cases, subjects keep a little scar on the place of the biopsy. There could rise some local muscle soreness the first two days after the muscle biopsy.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)

Elderly (65 years and older)

Inclusion criteria

* Male
* Age between 18 and 30 years of age
* BMI between 18.5 * 25 kg/m2
* Recreationally active, performing sports on a non-competitive basis
* Wmax * 5 *kg
* Willing to give muscle biopsies
* Willing to give blood samples
* Having a general-practitioner
* Consumption of alcohol beverages is less than 21 per week
* Able to perform three exercise sessions weekly for 12 weeks

Exclusion criteria

* Medical condition that can interfere with the study outcome (i.e. cardiovascular disease, pulmonary disease, liver or renal disease, diabetes mellitus type 1 or 2)
* Having a lactose and/or gluten intolerance
* Use of systemic medication (with the exception of antihistaminic medication and the use of occasional painkillers)
* (Chronic) injuries of the locomotor system (e.g. musculoskeletal/orthopedic disorders) that can interfere with the intervention
* Participants who are enrolled in an interventional biomedical research project or have received an investigational new drug or product with the last 30 days prior to screening.
* Smokers and use of illicit drugs
* Blood donor during the study and in the three months before start of the study
* Employed, or intern, or working on a thesis at the department of Human Nutrition at Wageningen University & Research
* Participating in another scientific study (except EetMeetWeet)

Study design

Design

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

Control:	Active
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	20-03-2017
Enrollment:	44
Type:	Actual

Ethics review

Approved WMO Date:	16-02-2017
Application type:	First submission
Review commission:	METC Wageningen Universiteit (Wageningen)
Approved WMO Date:	17-08-2017
Application type:	Amendment
Review commission:	METC Wageningen Universiteit (Wageningen)

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
CCMO	NL59885.081.16