# The effect of whey and casein protein ingestion prior to sleep on overnight muscle protein synthesis

Published: 18-07-2018 Last updated: 15-05-2024

The main aim of the current study will be to assess whether the ingestion of whey protein or casein protein stimulates overnight muscle protein synthesis following endurance-type exercise.

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

# **Summary**

## ID

NL-OMON50719

**Source** ToetsingOnline

Brief title PROsleepMITO

## Condition

• Other condition

**Synonym** building muscle protein, muscle protein synthesis

#### **Health condition**

spierherstel na inspanning

#### **Research involving**

Human

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## **Sponsors and support**

**Primary sponsor:** Universiteit Maastricht **Source(s) of monetary or material Support:** Ministerie van OC&W,TIFN

## Intervention

Keyword: endurance exercise, muscle protein synthesis, overnight recovery

## **Outcome measures**

#### **Primary outcome**

Overnight myofibrillar protein synthesis rate

#### Secondary outcome

- Overnight mitochondrial protein synthesis rate
- Plasma amino acid concentrations
- Hunger VAS
- Sleep VAS
- Caloric intake at breakfast

# **Study description**

#### **Background summary**

Previous research has shown that protein ingestion prior to sleep improves overnight muscle protein synthesis rates following resistance exercise. However, it is still unclear whether the type of protein ingestion influences the overnight muscle protein synthetic response and whether protein ingestion prior to sleep is also beneficial following endurance-type exercise.

#### **Study objective**

The main aim of the current study will be to assess whether the ingestion of whey protein or casein protein stimulates overnight muscle protein synthesis following endurance-type exercise.

#### Study design

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The present study will be a double blind, placebo controlled, parralel, intervention study.

#### Intervention

All subjects will perform a single session of endurance exercise in the evening. Prior to sleep, subjects will ingest a whey-protein drink, a casein protein drink, or a placebo drink.

### Study burden and risks

The subjects will participate in 1 screening and 1 test night. They will be required to fill out a medical guestionnaire during the screening session. Also a DEXA scan will be performed. There are no risks associated with the DEXA scan. The radiation dose emitted during a DEXA scan is 0.001 mSy. This is a very low exposure compared to the total background radiation in the Netherlands, which is ~2.5 mSv/year. During the screening session a VO2max test will be performed. On the testday two venous catheters will placed for repeated blood draws and amino-acid infusion. The subjects will perform a single session of endurance exercise in the evening of the testnight. Prior to sleep, the subjects will drink an experimental test drink that contains whey protein, casein protein, or a placebo drink. Following the ingestion of the test drink, subjects will sleep for 7 hours. Prior to sleep, and upon waking, a muscle biopsy will be taken. The subjects will be instructed to not perform an intense physical labout in the 48 h prior to the testday en for 24 h prior to the testday to not consume any alcohol, or to consume caffeine in 12 h prior to the testnight. During the day of the testnight, subjects will consume standardized meals that will be provided. There are no major risks of the endurance exercise session other than the expected risks associated with exercise performance (such as fatigue, fainintng and an abnormal blood pressure). The protein drinks contain protein that are normally present in nutrition (milk) and are safe for consumption.

# Contacts

**Public** Universiteit Maastricht

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# **Trial sites**

## **Listed location countries**

Netherlands

# **Eligibility criteria**

Age Adults (18-64 years) Elderly (65 years and older)

## **Inclusion criteria**

- Males
- Aged between 18-35 years
- Healthy
- 18.5 <= BMI <= 30 kg/m2

## **Exclusion criteria**

- Smoking
- Sports/exercise > 4 sessions/week
- Lactose intolerant
- A history of neuromuscular problems
- Use of anticoagulation medication

- Recent (<1 y) participation in amino acid tracer [13C6 or 3,5-D2-tyrosine] studies

- Individuals on any medications known to affect protein metabolism (i.e. corticosteroids, non-steroidal anti-inflammatories, or prescription acne medications)

# Study design

# Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Double blinded (masking used)
Control:	Placebo
Primary purpose:	Other

## Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	09-04-2019
Enrollment:	45
Type:	Actual

# **Ethics review**

Approved WMO	
Date:	18-07-2018
Application type:	First submission
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)

# **Study registrations**

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

No registrations found.

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

ID: 27053 Source: Nationaal Trial Register Title:

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# In other registers

Register	
ССМО	
OMON	

ID NL64719.068.18 NL-OMON27053