

# Prolonged muscle protein synthetic response to the ingestion of a large amount of protein

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The aim of this study will be to assess the ability of two different amounts of protein to stimulate muscle protein synthesis during a 12 h period following resistance exercise in a group of healthy young men.

<b>Ethical review</b>	Approved WMO
<b>Status</b>	Recruitment stopped
<b>Health condition type</b>	Other condition
<b>Study type</b>	Interventional

## Summary

### ID

NL-OMON48402

### Source

ToetsingOnline

### Brief title

BBQ-studie

### Condition

- Other condition

### Synonym

building muscle protein, muscle protein synthesis

### Health condition

Spieropbouw na inspanning

### Research involving

Human

## Sponsors and support

**Primary sponsor:** Universiteit Maastricht

**Source(s) of monetary or material Support:** Ministerie van OC&W

## Intervention

**Keyword:** milk protein, muscle protein synthesis, resistance training

## Outcome measures

### Primary outcome

Myofibrillar protein synthesis rates over the full assessment period (12 h)

### Secondary outcome

- Myofibrillar protein synthesis rates assessed over 3 periods (0-4, 4-8 and 8-12 hours)
- 1-13C-phenylalanine incorporation into muscle protein
- Plasma amino acid concentrations & enrichments
- Plasma glucose & insulin concentrations
- Whole-body protein metabolism (synthesis, breakdown, oxidation, balance)
- Whole-body protein kinetics (total rate of appearance, rate of endogenous appearance, rate of exogenous appearance, rate of disappearance)

## Study description

### Background summary

Protein is an essential stimulus for the recovery and growth of skeletal muscle tissue in athletes. Previous research has shown that the intake of 20-25 gram protein after exercise can maximally stimulate muscle protein synthesis in the first 4 hours following exercise. However, there is very little insight in the ability of larger amounts of dietary protein to stimulate muscle protein synthesis over a longer period after exercise.

## **Study objective**

The aim of this study will be to assess the ability of two different amounts of protein to stimulate muscle protein synthesis during a 12 h period following resistance exercise in a group of healthy young men.

## **Study design**

Randomized, single-blind (researchers blinded), controlled, parallel, intervention study.

## **Intervention**

All subjects will perform a single bout of whole-body resistance-type exercise. Subsequently, subjects will ingest a beverage containing 0, 25, or 100 g of protein

## **Study burden and risks**

The subjects will participate in 1 screening and 1 test day.

They will be required to fill out a medical questionnaire during the screening session. Also a bio-electrical impedance measurement will be performed. There are no risks associated with the bio-electrical impedance measurement. During the screening session, a maximal strength tests will be performed for 4 exercises.

The subjects will be instructed to record their physical activity and food intake for 2 days prior to the trial in diaries. In addition, the subjects will be instructed not to perform any intense physical labor in the 48 h prior to the test day, and in the 24 h prior to the test day not to consume any alcohol, or to consume caffeine in the 12 h prior to the test day. Prior to the test day, subjects will consume a standardized meal that will be provided by the researchers.

On the test day a venous catheter will be placed for repeated blood draws. The total amount of blood drawn (16 x 10 ml) is much lower compared to a blood donation (500 ml). The subjects will be continuously infused during the entire test day. The labelled, nonradioactive amino acid tracers are produced according to the GMP standard and are safe for human application. The subjects will perform a single 1 h session of resistance exercise on the test day. There are no major risks associated with the resistance exercise session, other than the expected risks associated with exercise performance (such as fatigue, fainting and an abnormal blood pressure). This will then be followed by the intake of an experimental test drink that contains milk protein, or a placebo drink. The protein drinks contain protein that are normally present in

nutrition (milk) and are safe for consumption. Following the ingestion of the test drink, subjects will remain in a rested state and won't consume any other nutrients during a 12 h period. Prior to intake of the drink, and 4, 8 and 12 hours following intake, a muscle biopsy will be taken.

## Contacts

### Public

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### Scientific

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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 18-40 years - Healthy -  $18.5 < \text{BMI} < 30 \text{ kg/m}^2$

### Exclusion criteria

- Smoking - Sports/exercise > 4 sessions/week - Lactose intolerant or allergies to milk protein  
- A history of neuromuscular problems - Use of anticoagulation medication - Recent (<9 mo) participation in amino acid tracer (L-[ring-2H5-phenylalanine, L-[ring-2H2]-tyrosine, and [1-13C]-leucine infusion) studies - Individuals on any medications known to affect protein metabolism (i.e. corticosteroids, non-steroidal anti-inflammatories, or prescription acne medications) - Strict vegetarian - Injury or condition that would limit the participant from performing the resistance exercise

## Study design

### Design

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

### Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	27-06-2019
Enrollment:	45
Type:	Actual

## Ethics review

Approved WMO	
Date:	12-06-2019
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

No registrations found.

### In other registers

Register	ID
CCMO	NL69523.068.19