The evaluation of cheese vs milk for stimulating post-prandial and post-exercise muscle protein synthesis

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The aim of this research study is to look at the effects of cheese ingestion at rest and after resistance type exercise training on muscle protein synthesis.

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

Summary

ID

NL-OMON48035

Source
ToetsingOnline

Brief title
Cheese Study

Condition

- Muscle disorders

Synonym
digestion/absorption, muscle growth

Research involving
Human

Sponsors and support

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

Intervention

Keyword: Cheese, Exercise, Muscle

Outcome measures

Primary outcome

The main study endpoint is the fractional synthetic rate (FSR) of mixed muscle

protein post-prandial (0 - 240 min) period.

Secondary outcome

Fractional synthetic rate of the basal (-150 - 0 min) period.

Total plasma amino acids

Plasma glucose and insulin

Whole-body protein kinetics

Study description

Background summary

Muscle tissue consists of proteins. These proteins are built up of small building blocks: amino acids. By consuming enough protein in our diet, we make sure that the body is provided with enough amino acids to facilitate muscle protein accretion.
In order to build up muscle mass, it is generally recommended to combine exercise training with protein-dense nutrition. A good source of protein is milk. However, milk can also be used to produce protein-dense products like cheese. It is of importance to gain insight into the effects of processed food (like cheese) on muscle growth.

Study objective

The aim of this research study is to look at the effects of cheese ingestion at rest and after resistance type exercise training on muscle protein synthesis.

Study design

Randomized parallel study design.

Intervention

39g milkprotein or 100g cheese (10 per group)

Study burden and risks

The burden and risks associated with participation are substantial. Insertion of the catheters is comparable to a blood draw and could result in a small hematoma. Muscle biopsies will be taken under local anesthesia by an experienced physician, but may cause some minor discomfort for maximally up to 24 h after completion. The discomfort is comparable to muscle soreness or the pain one has after bumping into a table. We will take 11 blood samples (10 mL) during the experimental trial. The total amount of blood we draw is less than half the amount of a blood donation and will be completely restored in approximately 1 month. Participants come to the university twice: 1 screening (3 hours) and 1 experimental trial (entire day). For both the screening and the experimental trial, participants have to be fasted, so they are not allowed to eat and drink (except for water) from 22h00 the evening before. Also, 3 days prior to the experimental trial participants should keep their diet as constant as possible, do not perform any type of intense physical exercise, and do not consume alcohol. During the screening we will perform a DEXA and a strength test. Furthermore, we will ask the participants to fill out a medical questionnaire and record their food intake and activity for 2 days prior to the experimental trial. During the experimental trial, we will collect muscle and blood samples, and participants have to perform resistance exercise and consume either 39g milk protein or 100g cheese. There is no direct benefit for the participants, only their contribution to scientific knowledge.

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

Healthy males
Age between 18 and 35 y inclusive
BMI between 18.5 and 30 kg/m2

Exclusion criteria

* Allergies to milk proteins
* Lactose intolerant
* Smoking
* Phenylketonuria
* Diabetes Mellitus
* Diagnosed GI tract disorders or diseases
* Arthritic conditions
* A history of neuromuscular problems
* Any medications known to affect protein metabolism (i.e. corticosteroids, non-steroidal anti-inflammatories, or prescription strength acne medications).
* Use of certain anticoagulants (use of thrombocyte aggregation inhibitors such as acetylsalicylic acid and carbasalaatcalcium is permitted. Use of other thrombocyte aggregation inhibitors will be discussed with the responsible physician)
* Blood donation within 2 months of study initiation
* Hypertension (according to WHO criteria)
* Recent participation in amino acid tracer studies (less than 1 year ago)

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	23-08-2019
Enrollment:	26
Type:	Actual

Ethics review

Approved WMO Date:	15-05-2019
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	NL69642.068.19