Plasma amino acid response after the ingestion of micellar casein versus caseinate in healthy young men

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To compare the digestion and absorption of micellar casein versus calcium-caseinate and sodium-caseinate with enzymatic cross-linking in healthy young men.

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

Summary

ID

NL-OMON44783

Source
ToetsingOnline

Brief title
Casein(ate) digestion

Condition

- Other condition

Synonym
amino acid absorption, protein digestion

Health condition

eiwitvertering

Research involving
Human

Sponsors and support

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

Intervention

Keyword: amino acid availabilty, caseine, digestion

Outcome measures

Primary outcome

Plasma amino acid response

Secondary outcome

Plasma insulin-, and glucose responses

Study description

Background summary

Protein intake is a strong stimulus for muscle protein anabolism, both at rest and after exercise. The anabolic effect of a protein supplement is mainly determined by the digestion and absorption kinetics of the ingested protein source. It is suggested that a slowly digested protein source is superior over a rapidly digested protein source during periods of limited food intake. In accordance, we have previously shown that the intake of casein, which is a slowly digested protein, increases muscle protein synthesis during the night. Casein can be provided either as micellar casein that clots as it enters the acid milieu of the stomach, or as a caseinate that remains solid. If casein clots or remains in solution may have an effect on its digestion and absorption kinetics and subsequent muscle protein synthesis rates. To determine the optimal composition of a casein supplement, the differences in digestion and absorption of casein versus calcium-caseinate and sodium-caseinate with enzymatic cross-linking should be examined first.

Study objective

To compare the digestion and absorption of micellar casein versus calcium-caseinate and sodium-caseinate with enzymatic cross-linking in healthy young men.

Study design

Randomized, double-blinded, crossed-over experiment

Intervention

Subjects will be randomly assigned to three experiments:
- a test beverage of 600 mL containing 40 g micellar casein in water,
- a test beverage of 600 mL containing 40 g calcium-caseinate in water,
- a test beverage of 600 mL containing 40 g sodium-caseinate with enzymatic-cross linking.
After ingestion, blood samples will be taken at regular intervals during a 6 hour resting period.

Study burden and risks

The risks involved in participating in this experiment are minimal. Insertion of a catheter in a vein is comparable to a normal blood draw and the only risk is a small local hematoma.

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

- Males
- Aged between 18-35 years
- Healthy, recreationally active (participating in recreational sports activities <= 3 times per week)
- BMI < 25 kg/m2
- No physical limitations (i.e. able to perform all activities associated with daily living in an independent manner).

Exclusion criteria

- Female
- Smoking
- Allergies to milk proteins
- Musculoskeletal disorders
- Use of any medications known to affect protein metabolism (i.e. corticosteroids, non-steroidal anti-inflammatories, or prescribed acne medications).
- Participation in any structured regular exercise program
- Chronic use of gastric acid suppressing medication or anti-coagulants
- Unstable weight over the last three months
- Pathologies of the gastrointestinal tract
- Blood donation in the 2 months prior to start of the study

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Masking:	Double blinded (masking used)
Control:	Uncontrolled

Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	10-11-2016
Enrollment:	15
Type:	Actual

Ethics review

Approved WMO Date:	30-06-2015
Application type:	First submission
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)
Approved WMO Date:	10-08-2016
Application type:	Amendment
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: 29333
Source: Nationaal Trial Register
Title:

In other registers

Register	ID
CCMO	NL52798.068.15
OMON	NL-OMON29333

Study results

Date completed:	13-02-2017
Actual enrolment:	15