

# The impact of milk protein glycation on plasma amino acid responses in healthy young men

Published: 08-11-2017

Last updated: 15-05-2024

To compare the plasma amino acid responses after the digestion of a milk protein powder with varying levels of protein glycation in 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-OMON44540

### Source

ToetsingOnline

### Brief title

Pro-G

### 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:** Friesland Campina

## Intervention

**Keyword:** amino acid availability, digestion, glycation, milk

## Outcome measures

### Primary outcome

Peak plasma lysine concentration

### Secondary outcome

Plasma amino acid, insulin-, and glucose responses.

## Study description

### Background summary

Protein intake is an essential stimulus for tissue replacement/growth in infants, as well as a strong regulator of muscle protein anabolism in athletes. The anabolic effect of protein ingestion is mainly determined by the plasma amino acid response after ingestion. Although some literature suggests that glycation of proteins, which can occur during commonly applied milk processing procedures, might attenuate the digestibility of a dairy product, this has not yet been extensively assessed in humans.

### Study objective

To compare the plasma amino acid responses after the digestion of a milk protein powder with varying levels of protein glycation in healthy young men.

### Study design

Double blind cross-over study with 3 interventions

### Intervention

Subjects will perform three experiments in a double-blind, randomized order:

- 40 g of milk protein with 5% glycation level in 600 mL water
- 40 g of milk protein with 20% glycation level in 600 mL water
- 40 g of milk protein with 50% glycation level in 600 mL of water.

After ingestion, blood samples will be taken at regular intervals during a 6 hour period.

### **Study burden and risks**

The risks involved in participating in this experiment are minimal. Insertion of the catheters in a vein is comparable to a normal blood draw and the only risk is a small local hematoma. The milk protein supplements are produced according to GMP standards and are safe for human use.

## **Contacts**

### **Public**

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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  $\leq 3$  times per week)
- BMI  $< 30$  kg/m<sup>2</sup>
- No physical limitations (i.e. able to perform all activities associated with daily living in an independent

## Exclusion criteria

- Smoking
- Allergies to milk proteins
- Allergies to soya products
- Musculoskeletal disorders
- Use of any medications known to affect protein metabolism (i.e. corticosteroids, non-steroidal anti-inflammatories, or prescribed acne medications).
- Chronic use of gastric acid suppressing medication or anti-coagulants- Unstable weight over the last three months
- Pathologies of the gastrointestinal tract
- Strictly vegetarian diet
- Blood donation in the past 2 months

## Study design

### Design

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

### Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	08-12-2017

Enrollment: 15  
Type: Actual

## Ethics review

Approved WMO  
Date: 08-11-2017  
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: 29239  
Source: NTR  
Title:

### In other registers

Register	ID
CCMO	NL62254.068.17
OMON	NL-OMON29239

## Study results

Date completed: 02-05-2018  
Actual enrolment: 17