

# The evaluation of canola protein and whey protein to support muscle conditioning in vivo in young females

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The purpose of this study is to evaluate whether consumption of canola and whey protein when compared to a placebo stimulates muscle growth after resistance exercise.

<b>Ethical review</b>	Approved WMO
<b>Status</b>	Completed
<b>Health condition type</b>	Muscle disorders
<b>Study type</b>	Interventional

## Summary

### ID

NL-OMON51718

### Source

ToetsingOnline

### Brief title

ALPACA study

### Condition

- Muscle disorders

### Synonym

Muscle anabolism, Muscle growth

### Research involving

Human

### Sponsors and support

**Primary sponsor:** Medisch Universitair Ziekenhuis Maastricht

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

## Intervention

**Keyword:** Exercise, Muscle, Plant-derived, Protein

## Outcome measures

### Primary outcome

Postprandial muscle protein synthesis rates (0-5h)

### Secondary outcome

Basal muscle protein synthesis rates

Plasma glucose, insulin, amino acids + corresponding peak values and (i)AUC

Plasma  $^{13}\text{C}_6$ -phe enrichments

Muscle signalling pathways

## 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 building. Providing the growing world population with sufficient animal-derived protein is a challenge. Plant proteins can be produced on a more sustainable commercial scale than conventional animal-derived proteins and therefore, can contribute to feeding our future population. Canola protein is a protein that is derived from rapeseed. The composition of canola seems to be comparable to that of other high-quality animal-based protein sources. But there is no data yet on the effect of canola protein ingestion on muscle growth. Additionally, most research on the effect of protein intake and muscle growth/recovery has been performed in males and we need more insight into the effect in females.

### Study objective

The purpose of this study is to evaluate whether consumption of canola and whey protein when compared to a placebo stimulates muscle growth after resistance exercise.

## Study design

randomized, controlled, parallel-group, double-blind intervention trial

## Intervention

20g Whey protein, 20g canola protein, or non-caloric placebo drink  
Strength exercise

## Study burden and risks

The burden and risks associated with this study are moderate. It is a short study (1.5 days) with a few invasive, but low-risk measurements. It is possible that for a few days there is a feeling of soreness after the biopsies which is comparable to the soreness after bumping into a table. Also, there is a possibility of some additional bleeding after the biopsies. For 3 biopsies this risk is present 3 times in total, but it is no major health risk. Placing the cannulas during the test day can be uncomfortable and can result in a small hematoma. However, this makes the 12 blood draws relatively easy. The amount of blood that is drawn (130 mL) is way less than an average blood donation and will recover within a month.

In total, participants visit the university twice, being fasted on both occasions. On the test day participants will stay fasted for a longer time, which can cause a feeling of hunger. Water drinking is allowed and unlimited. Furthermore, the participants will fill out diaries 2 days prior to the test day that will cost 30 minutes. During these days, they are also not allowed to drink alcohol or do heavy physical activities.

The strength test and strength training will be performed under supervision, but can be a bit exhausting and cause some muscle soreness when the participant is not used to doing these exercises.

The dexa scan provides valuable data about the body composition, but has a small radiation burden. This burden is negligible when compared to the yearly background radiation.

The drinks will consist of 500 mL and will have to be consumed within 5 minutes. There is no direct benefit for the participants, only their contribution to scientific knowledge. The participants will get more insight into their body composition and sports performance (maximal muscle strength)

## Contacts

### Public

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## **Scientific**

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## **Trial sites**

### **Listed location countries**

Netherlands

## **Eligibility criteria**

### **Age**

Adults (18-64 years)

### **Inclusion criteria**

- Female sex
- Age between 18 and 35 y inclusive
- BMI between 18.5 and 30 kg/m<sup>2</sup>
- Having given informed consent

### **Exclusion criteria**

- Intolerant to milk products
- Mustard allergy
- Participating in a structured (progressive) exercise program
- Smoking regularly
- Diagnosed GI tract disorders or diseases
- Diagnosed musculoskeletal disorders
- Diagnosed metabolic disorders (e.g. diabetes)
- Hypertension (blood pressure above 140/90 mmHg)
- Donated blood 3 months prior to test day
- Pregnant
- Using third generation oral contraceptives
- Use of any medications known to affect protein metabolism (i.e.

corticosteroids, non-steroidal anti-inflammatories).

- Chronic use of gastric acid suppressing medication
- Chronic use of anti-coagulants
- Recent (<1 year) participation in amino acid tracer (L-[ring-13C6]-phenylalanine and L-[3,5-2H2]-tyrosine studies

## Study design

### Design

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

### Recruitment

NL	
Recruitment status:	Completed
Start date (anticipated):	20-03-2023
Enrollment:	50
Type:	Actual

## Ethics review

Approved WMO	
Date:	29-09-2022
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**

<b>Register</b>	<b>ID</b>
CCMO	NL81203.068.22