Evaluation of a novel alternative protein source to stimulate post-exercise muscle protein synthesis

No registrations found.

Ethical review	Positive opinion
Status	Recruitment stopped
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON24702

Source
Nationaal Trial Register

Brief title
MEALWORM

Health condition

Young adults, Muscle protein synthesis

Sponsors and support

Primary sponsor: Maastricht University
Source(s) of monetary or material Support: Maastricht University

Intervention

Outcome measures

Primary outcome

The main study endpoint is the fractional synthetic rate (FSR) of muscle protein synthesis (myofibrillar proteins) from 0-5 hours in the post-prandial period.

Secondary outcome

-The fractional synthetic rate (FSR) of muscle protein synthesis (myofibrillar proteins) from -3-0, 0-2 and 2-5 hours in the post-absorptive and post-prandial period respectively.

-Whole-body protein kinetics (synthesis, breakdown, oxidation, net balance).

-Plasma enrichments (in MPE) of:

o L-[ring-2H5]-phenylalanine o L-[1-13C]-phenylalanine

o L-[1-13C]-leucine

o L-[ring-2H4]-tyrosine

o L-[3,5-2H2]-tyrosine

o L-[1-13C]-KIC

-Plasma total phenylalanine, leucine and tyrosine concentrations (expressed as µmol/L)

-Total plasma amino acids (AAmax [µmol/L])

-Plasma glucose (glucosemax [mmol/L])

-Plasma insulin (insulinmax [mU/L])

Study description

Background summary

Rationale: Conventional animal-based proteins such as meat (i.e. beef, pork, lamb), poultry, fish, eggs, and dairy are considered “high-quality” sources of dietary protein as they contain all of the essential amino acids (EAA) and are highly digestible. However, the production of sufficient amounts of animal-based protein from conventional sources to meet future global

food demands represents a challenge. Edible insects have been proposed as an alternative source of dietary protein that can be produced on a viable and more sustainable commercial scale and, as such, may contribute to ensuring global food security. Many edible insects represent a rich source of protein, comparable to conventional meat and fish, and provide EAA in amounts comparable to certain high quality protein sources. However, there is currently limited data on the functional capacity of insect-based protein sources. Therefore, the aim of the present study is to assess the capacity of insect based proteins to stimulate postprandial skeletal muscle protein synthesis and support protein anabolism in vivo in humans to determine their nutritional quality when compared to a more conventional animal-based protein source.

Study objective

We hypothesise that mealworm protein ingestion after unilateral resistance exercise will lead to significant higher rates of muscle protein synthesis in the trained leg compared to the untrained control leg. We also hypothesise that these rates will be equivalent to muscle protein synthesis after ingestion of milk protein.

Study design

t=0, t=120, t=300 muscle biopsies

13 blood draws

Intervention

-Unilateral exercise bout with different protein drinks

Contacts

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Eligibility criteria

Inclusion criteria

-Healthy males

-Age between 18 and 35 y inclusive

-BMI between 18.5 and 30 kg/m2

-Having given informed consent

Exclusion criteria

-Use of tobacco products

-Non-steroidal anti-inflammatory drugs (NSAID) in the 4 days prior to the experimental trial

-Allergies to milk proteins (whey or casein)

-Allergies to house dust mites or crustaceans

-Lactose intolerance

-Phenylketonuria (PKU)

-Blood donation within 2 months of study initiation

-Arthritic conditions

-A history of neuromuscular problems

-Previous participation in amino acid tracer studies

-Individuals on any medications known to affect protein metabolism (i.e. corticosteroids, non-steroidal anti-inflammatories, or prescription strength acne medications)

-Diabetes

-Training more than 5 days per week

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Non controlled trial
Masking:	Double blinded (masking used)
Control:	Active

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	20-03-2018
Enrollment:	24
Type:	Actual

IPD sharing statement

Plan to share IPD: Undecided

Ethics review

Positive opinion

Date:	14-03-2018
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

ID: 47452
Bron: ToetsingOnline

Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL6897
NTR-old	NTR7084
CCMO	NL58529.068.16
OMON	NL-OMON47452

Study results