Research into the absorption kinetics of plant proteins isolated from potato

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

Summary

ID

NL-OMON35889

Source
ToetsingOnline

Brief title
Kinetics Absorption of Proteins derived from Potato (Kappa-study)

Condition

- Other condition

Synonym
digestion of proteins, kinetics absorption amino acids

Health condition

Geen aandoening, maar de kinetiek van absorptie in gezonde proefpersonen

Research involving
Human

Sponsors and support

Primary sponsor: AVEBE
Source(s) of monetary or material Support: bedrijf

Intervention

Keyword: absorption, blood glucose, insulin, potato protein

Outcome measures

Primary outcome

Blood profiles of total and individual amino acids in time as a measure of

protein digestion and absorption kinetics

Secondary outcome

Blood glucose and insuline levels in time as a measure of the insulinotropic

response of the potato proteins

Tertiary outcome: Satiety hormones (only to be performed if blood amino acids

profiles are comparable to whey protein) to assess the effect of protato

proteins on satiety.

Study description

Background summary

The kinetics of protein digestion determines the kinetics of appearance of amino acids in blood. Differences in kinetics in protein digestion are related to bioavailability of amino acids for synthesis of muscle protein, regeneration of muscle glycogen (important after physical excercise) and satiety. In addition, insight into the blood amino acid profiles is important for the right use in functional foods. The digestion kinetics of two potato proteins, the high molecular weight fraction (HMW) and the low molecular weight fraction (LMW), is not known.

Study objective

The primary aim of the study is to determine the digestion kinetics of the two potato proteins and to compare these kinetics with casein and whey protein, two frequently used food proteins. The digestion kintetics will be determined using blood amino acid profiles in time.
The secundairy aim is to determine the effect of the two potato proteins on blood insulin and glucose levels to gain insight into the insulinotropic effects of the two potato proteins.
Finally, the tertiary aim is to determine the effects of the two potato proteins on blood satiety hormones, in order to test the potential for satiety products. This will only be performed if the postprandial blood amino acid profile is comparable to that of whey protein.

Study design

In a double-blinded cross-over study, the following 4 pateurized protein drinks (20 g protein in 500 mL protein- and sugar free sports drink; matrix with a non-caloric sweetner, flavors, vitamins and stabilisers) will be tested in fasted subjects:
1) whey protein (reference drink with fast digestible protein; positive control); 2) high molecular weight fraction potato protein (HMW); 3) low molecular weight fraction (LMW); 4) casein (reference drink with slow digestible protein). The test days will be separated by a wasout period of 1 week. The test drinks will be randomized in time.

Blood (5 mL) will be samples every 15 minutes, starting 15 minutes before drinking the test drink. After the second blood sampling, the drink will be provided,The last sample will be drawn 3 h after the ingestion of the test drinks. To this end, a vein in the underarm will be canulated.

Each intervention day, 14 blood samples of 5 m each will be drawn. The total blood sampling per day wil be 70 mL. the total blood sampling during the whole period will be 280 mL over 4 weeks.

The design is comparible, but not identical to a design by Farnfield et al. (2009)

Intervention

see the composition of the test drinks in DESIGN

Study burden and risks

Burden:

During 4 days a 3-h hospital visit. Subjects are asked to come over to the hospital in fasted state. A vein in the under arm will be canulated . Every 15 minutes, a blood sample of 5 mL will be drawn. Per test day, 14 samples will be drawn (70 mL total). The subjects will consume 500 mL of a testdrink. During 4 evenings the subjects have to follow dietary instructions and refrain from sports. Also the morning before vissiting the hospital, the subjects have to refrain from sports.

Risk:
Blood sampling will be performed by experienced research nurses and will be at low risk. No risk is expected from a single high potato protein comsumption.

Contacts

Public
AVEBE

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NL
Scientific
AVEBE

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Age 18 - 50 years
Informed consent
Willing to consume a standardized diet on the evening before the intervention days (instructions).
Willing to refrain from sports on the evening before and on the morning of the intervention days.

Exclusion criteria

Gastrointestinal disease, such as gastric reflux, inflammatory bowel disease, pancreatic disease (self-reported)
Gastrointestinal surgery (self-reported)
Kidney disease (self-reported)
Allergy to cow's milk (self-reported)
Intensive sports (> 16 h week)
Use of protein supplements, inibitors gastric acid secretion, norit, laxatives or drugs
High alcohol intake (> 4 consumptions/ day or > 20 consumptions per week)
Smokers

Study design

Design

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

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	07-10-2011
Enrollment:	8

Type:	Actual

Ethics review

Approved WMO Date:	13-09-2011
Application type:	First submission
Review commission:	METC Wageningen Universiteit (Wageningen)

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	NL36997.081.11