# The effect of a low protein diet compared with a high protein diet on food reward

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The primary objective of this study is to assess the effect of a 16-day low protein diet on reward response when exposed to sight and smell of food stimuli high and low in protein compared with a high protein diet.

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

# Summary

## ID

NL-OMON37647

**Source** ToetsingOnline

Brief title ProBrain

## Condition

• Other condition

#### Synonym

obesity, overweight

#### Health condition

obesitas

**Research involving** Human

## **Sponsors and support**

**Primary sponsor:** Wageningen Universiteit **Source(s) of monetary or material Support:** Stichting Technologische Wetenschappen (STW),CSM,Danone Vitapole,Friesland Nutrition,TNO,Unilever

### Intervention

Keyword: brain activity, food preferences, protein, reward

## **Outcome measures**

#### **Primary outcome**

Our main outcome measurement is the change in brain reward response to sight

and smell of high and low protein food stimuli after the 16-day low protein and

high protein diets.

#### Secondary outcome

• To assess the effect of a 16-day low protein diet on different aspects of

food reward: the explicit liking, the explicit wanting, the implicit wanting

and a forced food choice of high and low protein food using the computerized

Leeds Food Preference Questionnaire (LFPQ) compared with a high protein diet.

• To assess the effect of a 16-day low protein diet on protein and energy

intake compared with a high protein diet.

# **Study description**

#### **Background summary**

Protein is an indispensable component within the human diet. It has been posed that protein intake is tightly regulated in the human body. In a previous study we showed that following a protein deficit, food intake and food preferences changed to restore adequate protein status.

#### **Study objective**

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The primary objective of this study is to assess the effect of a 16-day low protein diet on reward response when exposed to sight and smell of food stimuli high and low in protein compared with a high protein diet.

## Study design

The study will consist of a 16-day fully controlled dietary intervention that will involve consumption of individualized, isoenergetic menus providing either 0.5 g protein/kg BW/day (low protein diet), or 2.0 g protein/kg BW/day (high protein diet), using a randomized crossover design. The diets will be followed by a 1-day ad libitum-phase, where protein (g) and energy (kJ) intake will be measured. Changes of reward responses in the brain will be measured by using functional magnetic resonance imaging (fMRI) when exposed to sight and smell of high and low protein food stimuli. Food preference will be measured by subjective ratings.

#### Intervention

The study will consist of a 16-day fully controlled dietary intervention that will involve consumption of individualized, isoenergetic menus providing either 0.5 g protein/kg BW/day (low protein diet), or 2.0 g protein/kg BW/day (high protein diet).

### Study burden and risks

The study duration will consist of 2 periods where subjects will follow a controlled diet (two times 16 days). Afterwards there will be 1 ad libitum day where subjects can eat as much as they want of the products we offer. After the two diets participants will visit the fMRI facility in Ede (Hospital Gelderse Vallei) to undergo fMRI measurements (in total 3 times, including 1 baseline measurement). The study is non-therapeutic to the participants. The risk associated with participation is negligible.

# Contacts

Public Wageningen Universiteit

P.O. Box 8129 6700 EV Wageningen NL **Scientific** Wageningen Universiteit P.O. Box 8129 6700 EV Wageningen NL

# **Trial sites**

## **Listed location countries**

Netherlands

# **Eligibility criteria**

Age

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

## **Inclusion criteria**

Pag. 8 protocol:

- Age: 18-35 years
- BMI: 18.5 25.0 kg/m2
- Healthy (as judged by the participant)

## **Exclusion criteria**

Pag. 8 protocol:

- Restraint eating (men: score > 2.25; women: score > 2.80)
- Lack of appetite
- Having difficulties with swallowing/eating
- Usage of an energy restricted diet during the last two months
- Weight loss or weight gain of 5 kg or more during the last two months
- Stomach or bowel diseases
- Kidney disorders
- Diabetes, thyroid disease, other endocrine disorders
- · Having a history of neurological disorders
- Having taste or smell disorders
- Usage of daily medication other than birth control pills
- Pregnant or lactating
- Smoking more than one cigarette a day
- Being a vegetarian
- Being allergic/intolerant for products under study

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- Working at the division of human nutrition (WUR)
- Having participated in \*ProTime\*, or current participation in other research from the division of

Human Nutrition (WUR).

• Having a contra-indication to MRI scanning (see page 9 of protocol)

# Study design

## Design

Study type:	Interventional
Intervention model:	Crossover
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Other

## Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	01-03-2012
Enrollment:	24
Туре:	Anticipated

# **Ethics review**

Approved WMO	
Date:	05-03-2012
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 CCMO ID NL39292.081.11