Interaction between muscle activity related to mastication and palatal reduction, increased textural hardness and the perceived hardness of gels

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The primary objective of this study is to monitor the muscle activity related to textural hardness of the food during the consumption of liquids, semi-solid and solid food.

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

Summary

ID

NL-OMON37593

Source
ToetsingOnline

Brief title
Mastication and Texture

Condition

- Other condition

Synonym
obesity, overweight

Health condition

overgewicht en obesitas

Research involving
Human

Sponsors and support

Primary sponsor: TI Food and Nutrition
Source(s) of monetary or material Support: TI Food an Nutrition

Intervention

Keyword: chewing behaviour, hardness, oral processing, textural hardness perception

Outcome measures

Primary outcome

Electromyography (EMG) is used to measure the electrical activity, which is an indicator of muscle contraction and thereby the force that is needed to process the food (palatal reduction, mastication). The muscle activity is recorded as a function of time. The outcomes measurements are for example area under the curve, average voltage and maximum voltage.

Secondary outcome

Sensory attributes (like taste & hardness) will be rated by the subjects

Study description

Background summary

Texture, taste and aroma are some of the important factors influencing liking of the product. The property texture is mainly perceived through mastication and palatal reduction. To understand how the mouth reacts to texture, this study uses electromyography (EMG). The activity of the masseter, temporalis and suprahyoid muscles will be measured. Sensors will be placed on the face to monitor the electrical activity of the muscles and thus the muscle contraction and force needed to process the food. Liquids, semi-solid and solid foods, with an increased textural hardness for each product will be tasted during the experiment. We hypothesize that increasing the textural hardness in all three type of foods will be reflected by an increase of EMG activity for the muscles active during the consumption. Overall, this study will provide insight from mastication to palatal reduction and the perceived textural hardness of foods related to different types of oral processing. Within subjects, the

reproducibility of the muscle activity during mastication is also explored.

Study objective

The primary objective of this study is to monitor the muscle activity related to textural hardness of the food during the consumption of liquids, semi-solid and solid food.

Study design

The experiment is an intervention. Each subject will participate in two, exactly the same, sessions spaced one week apart. In both the sessions several foods will be consumed and attributes associated with textural hardness, while measuring muscle activity with electromyography (EMG). Within subject comparisons between products and rated attributes are made.

Intervention

Each subject will participate in two, exactly the same, sessions spaced one week apart. In both the sessions several products (with different concentrations of gelatin in water) will be consumed.

Study burden and risks

The study is non-therapeutic to the participant. The risk associated with the participants is low as well as the burden. Both measurement sessions will last about 2 hours, in total it will about 4-5 hours within two weeks for each participant.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

- adults: 18-50 years
- normal weight: BMI 18.5 - 25.0 kg/m2
- apparently healthy (self-reported by the participant)

Exclusion criteria

• Regular smoker > 1 cigarette per day
• Aversion or dislike for the foods under study (score <3 on a 5-point scale)
• Having followed an energy-restricted diet during the last 2 months
• Hypersensitivity (allergy and/or intolerance) for food products under study
• Experienced discomfort or difficulties with swallowing or chewing
• Wearing braces, that limit oral movements
• Mouth/tongue piercings
• Wearing glasses and have poor sight within a meter (contacts are fine)
• Believes/lifestyle/eating habits are in conflict with the food products under study
• Having a beard

Study design

Design

Study type: Interventional
Masking: Open (masking not used)

Control:	Uncontrolled
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	27-06-2012
Enrollment:	15
Type:	Actual

Ethics review

Approved WMO

Date:	01-06-2012
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	ID
CCMO	NL39023.081.12