



PPS-jaarrapportage 2017

De PPS-en die van start zijn gegaan onder aansturing van de topsectoren dienen jaarlijks te rapporteren over de inhoudelijke en financiële voortgang. Voor de inhoudelijke voortgang dient dit format gebruikt te worden. Voor PPS-en die in 2017 zijn afgerond is een apart format "PPS-eindrapportage" beschikbaar.

De jaarrapportages worden integraal gepubliceerd op de websites van de TKI's/ topsector. Zorg er svp voor dat er geen vertrouwelijke zaken in de rapportage staat.

De PPS-jaarrapportages dienen voor 1 maart 2018 te worden aangeleverd bij de TKI's bij info@tkitu.nl of info@tki-agrifood.nl. Voor Wageningen Research loopt de aanlevering via een centraal punt.

Algemene gegevens	
PPS-nummer	AF-15504
Titel	Smooth Bite for All
Thema	Gezond&Veilig
Uitvoerende kennisinstelling(en)	Wageningen University and Research
Projectleider onderzoek (naam + emailadres)	Dr. Markus Stieger markus.stieger@wur.nl
Penvoerder (namens private partijen)	Michiel Sytsma sytsma@tifn.nl
Contactpersoon overheid	onbekend
Startdatum	01-07-2016
Einddatum	30-06-2020

Goedkeuring penvoerder / consortium

De jaarrapportage dient te worden besproken met de penvoerder/het consortium. De TKI's nemen graag kennis van evt. opmerkingen over de jaarrapportage.

De penvoerder heeft namens het consortium de jaarrapportage goedgekeurd
 niet goedgekeurd

Evt. opmerkingen over de jaarrapportage:

Korte omschrijving inhoud/doel PPS

The aim of the project is to determine the influence of structural and textural food properties and expectations of foods on bolus properties, oral processing behavior, dynamic sensory perception and liking in consumer groups varying in age, ethnicity and eating capability.

Resultaten

The way food is processed inside the mouth up to the swallowing point is denoted as oral processing. This process plays a key role in sensory perception, consumer acceptance and food intake. However, limited information is available with regards to the way in which varying the physical properties of food impact oral processing behaviour. The aim of the project is to determine the influence of mechanical and rheological properties, liking, consumption frequency and familiarity on oral processing behaviour of drinkable, spoonable and chewable foods. Consumers adapt their oral behaviour with respect to bite size, consumption time, and eating rate to the rheological and mechanical properties of liquid, semi-solid and solid foods. Eating rate was strongly correlated with consistency of liquid and semi-solid foods. Oral processing behaviour is mainly determined by the rheological and mechanical properties of liquid, semi-solid and solid foods.

The project quantified the effect of age, ethnicity and eating capability on natural oral behaviour of foods differing in physical properties. Consumption time, number of chews, eating rate and bite size were affected by age, gender and ethnicity.

The presence of different mechanical properties in foods provides an intra-oral sensory variability that is linked to the continuous qualitative and quantitative changes of perceived texture. Such textural variation is associated to texture contrast perception. It has been proposed that texture contrast can boost sensory responses during mastication due to the experience of complex sensorial stimulation. Little is known about the mechanical properties of food components that lead to the perception of texture contrast. The aim of the project is to investigate the influence of mechanical and physico-chemical properties of semi-solid model food gels on the detection and temporal perception of texture contrast as a perceptual heterogeneity. The detection limit of texture contrast, the perception of heterogeneity within one bite of a composite gel, was largely influenced by the mechanical properties of the gel. The detection limit varied between brittle (agar) and elastic (gelatine) gels and between soft (low fracture stress) and hard (high fracture stress) gels. In soft and brittle agar gels, heterogeneity was perceived already when the difference in fracture stress between the layers was small ($\Delta\sigma_F=5\text{kPa}$). In soft and elastic gels (κ -carrageenan, gelatine), or hard gels, heterogeneity was perceived only when the difference in fracture stress between the layers was large ($\Delta\sigma_F\geq 20\text{kPa}$). Gelatine gels were perceived with a higher intensity of heterogeneity during mastication, probably due to a combination of the melting of gelatine and its elastic behaviour during oral processing. In terms of serum release, agar gels displayed the highest values (5.0-11.5%), followed by κ -carrageenan (3.0-4.5%) and gelatine gels (0.1-3.0%). The relative low amount of water released during compression for all gels (between 1-12%) suggests that in this study serum release did not considerably contribute to the perception of texture contrast. We conclude that mechanical properties of food mainly impact texture contrast detection, whereas a combination of physico-chemical properties influence the perception of heterogeneity over time.

The aim of the study was to investigate the influence of size and mechanical properties (hardness) of dispersed particles present in liquid and gelled food matrices on sensory perception and hedonic response. Size and hardness of the added particles significantly influenced the sensory perception of soups and gels.

Many foods that are frequently consumed consist of multiple food components, for example bread with toppings such as cheeses or mayonnaises. Such foods are referred to as composite foods. The individual components of composite foods can differ considerably in composition, mechanical properties and sensory characteristics. During oral processing the components are broken down differently and mixed together in the mouth to form a bolus. Limited knowledge is available about the oral processing behaviour and sensory perception of composite foods. The aim of this study was to investigate the effect of different toppings on oral processing behaviour and dynamic sensory perception of carrier foods when consumed as composite foods. Both the properties of carriers and toppings impacted oral processing behaviour and dynamic sensory perception of composite foods.

Aantal opgeleverde producten in 2017 (geef in een bijlage de titels en/of omschrijving van de producten of een link naar de producten op openbare websites)			
Wetenschappelijke artikelen	Rapporten	Artikelen in vakbladen	Inleidingen/ workshops
1	1	-	5

Bijlage: Titels van de producten of een link naar de producten op een openbare website

Santagiuliana, M.; Piqueras-Fiszman, B.; van der Linden, E.; Stieger, M.; Scholten, E. (2018) Mechanical properties affect detectability of perceived texture contrast in heterogeneous food gels. Food Hydrocolloids 80:254-263.
 Annual TiFN/TKI/NWO project progress report
 2 expert discussion meetings and three partner visits to industrial partners