
The role of saliva in the sensory perception of textures of semisolid foods

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Perception of texture is a dynamic process that occurs as a food is orally processed. While most research in the area of oral processing and sensory perception has focused on hard solid foods, the contribution of oral processing to sensory perception of semi-solid foods is less studied. A semi-solid food matrix is a soft structure and requires little in the way of force to break. Saliva is a main contributor to changes to the bolus during oral processing of this type of matrix due to the interactions between the food and salivary components. The exact contribution of saliva to texture perception of the bolus is yet to be elucidated. The aim of the current work was to examine the relations between salivary input during oral processing and the temporal aspects of texture perception as it occurs with starch thickened purees. Using samples of pureed carrot matrices thickened with starch as a model system, sensory and instrumental tests were conducted. Temporal dominance of sensations results revealed that samples were perceived as thick and grainy throughout oral processing. Instrumental viscosity measurements, carried out by adding fresh stimulated saliva or water to the samples showed that viscosity did not differ between low starch concentration samples with saliva and with water, however at higher starch contents, viscosity was significantly lower when the product was mixed with saliva. This suggests that starch hydrolysis may be occurring. To further examine this, the oral starch breakdown of the bolus was measured in vitro, at three different time-points simulating the different stages of oral processing. The amount of maltose released from the product was used as an indicator of the degree of starch hydrolysis. Sensory perception of viscosity at these specific time-points was also measured using Progressive Profiling. Small variations in maltose release among starch concentrations and over the time of oral processing were observed and may explain some of the differences in perceived viscosity found with sensory testing. Results indicate that it is important to incorporate saliva into instrumental testing to better understand dynamics of texture perception of semi-solid foods.