Impact of Food Texture on Food Oral Processing and Sensory Analysis

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In the last decade, the global changes in lifestyle and increased health awareness of the consumers, put pressure on producers to develop or more accurately re-designed food products with reduced glycemic index, lower salt content, lower fat content, lactose free etc to sustain the consumer acceptability. These requirements need a broad knowledge not only of the chemical part and content of the food, but also of food physics and the way that the food will be transformed to bolus and what would be people's sensory reaction to the changes.

Food structure plays an important role in chewing behavior and in consequence in oral processing. Oral processing leads to complex transformations of food where mechanical processes like fragmentation, agglomeration, hydration, and lubrication take place and affect the sensory perceptions of the texture, aroma and flavor in the mouth. Usually, the accent is always on the newly developed product and not on the eating process itself, but recently the new field of study emerged that addresses the connection among the structure – oral-processing – sensory properties.

Bread is a one of the foods that can act as a model of porous structure to establish relationship between oral processing and sensory perception. Therefore, our laboratory started with investigation of the oral processing behavior of different bread and bakery structures (bread, crisps and cookies) and related them to their textural and sensory characteristics. Different bakery samples with similar ingredients but different structures were selected. Samples were chewed by healthy subjects, and the masticatory performance (time, biting rate, sample weight, saliva content) was analyzed. In vivo food boluses were collected at the swallowing point and their textural properties were analyzed immediately after collection. Finally, food texture and structure were analyzed using descriptive sensory analysis. Bolus analysis showed different texture characteristics depending on the sample's characteristics and subjects. Data obtained from sensory analysis revealed correlations with instrumental results. The study provided better understanding of food oral processing and the impact of food structure in mastication behavior and sensory perception.

Keywords: food structure, food texture, food oral processing, sensory perception