

## Mastication and Texture of Food

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Mastication is one of the neurophysiological based complex processes, which involves the activities of masseter muscles. During mastication there is secretion of saliva which helps in the formation of bolus for swallowing. Texture was explained as a result of various structural and mechanical properties of food which are detected with the help of various senses. During the sensory analysis, texture perception is one of the important parameter. Thus there is a need of a novel technique for measuring mastication during chewing of various food products in *in vivo* conditions.

The concept of mastication could be explained in terms of its relation to neuromuscular activities, perception towards texture of food and changes in food properties. During mastication coordination between teeth, lips, gums, tongue, cheek, palate, salivary glands and muscle of the jaws is required. Mastication is one of the neurological and physiological based complex processes, which involves the activities of facial, elevator and suprahyoidal muscles along with movement of tongue which results in rhythmic mandibular movements with breakdown of food.

The pattern of human subject's chewing behaviour during mastication also affects the perception of food texture. During mastication physical properties of food keep on changing in the oral cavity, so the mastication variables can be analysed at different stages of mastication (early, middle and late). A number of methods are used for the analysis of mastication patterns. The study of mastication process has an important role in the food texture perception and its acceptance by the consumers.

Texture is governed by surface response of touch in mouth, deep response of masseter muscles and potentially by auditory means. Texture assessment of food occurs inside the mouth. Texture assessment is based on individual perception of human subject which varying among them. It is well explained by various physical and sensory parameters were used for texture evaluation. Instrumental texture profile analysis continuously used measurable method can be used as a low cost, but it not mimics the inside environment of the mouth and the psychological aspects of texture. The sensory TPA which includes the dynamics of food rheology during mastication may also contain biasness.

Texture is the sensory and functional attribute of the food which depends on its surface, structural and mechanical properties. It is one of the important steps in designing new food products. Now an emerging technique "Electromyography" based on generation of myoelectrical activity during activation of masseter muscles is used to describe various texture related mechanical attributes of wide range of food products. EMG technique is influenced by various non-instrumental and instrumental variables: non-instrumental like number of sessions, number of food samples in a session, replicates of a sample, number of human subjects, facial anatomy, gender, age, time, personality, psychology, side of mastication, denture, swallowing problem and effect of training; and instrumental like frequency, amplification, data acquisition, voltage and time parameters. These variables bring about changes in the subject's chewing behaviour. EMG plays a significant role in texture evaluation of food and shows good correlation with sensory and textural analysis for various food products.

Electromyography (EMG) is an upcoming technique for food texture evaluation which has the potential to come up as a successful comprehensive texture evaluation method. EMG texture evaluation is in its development phase and its relations with conventional texture measurement techniques need to be established and evaluated.

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