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The influence of oral processing on food perception

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When we chew, the food is broken down by the teeth, while saliva moistens the food and binds the masticated food into a food bolus that can be easily swallowed. Food properties such as structure, composition, appearance, size and shape influence the masticatory function. Hard and dry foods require a relatively large number of chewing cycles before the food is suitable to swallow. More time is needed to fragment the food into small particles and to add enough saliva to the food to form a cohesive bolus that can be swallowed. Chewing a soft food like a banana will lead to different movement patterns of the lower jaw than chewing a crispy food like potato chips. Taste, flavour and texture are perceived during chewing and will contribute to the appreciation of the food. Also, visual information of a food product is essential in the choice and the acceptance of food products. Auditory information obtained during the chewing of crispy products will provide information on whether a product is fresh or stale. Food perception does not just depend on one individual sense but is the result of multisensory integration of unimodal signals. Large differences in oral physiology parameters exist among individuals, which may lead to differences in food perception. Characteristics of the oral system, like number of teeth, jaw muscle activity, bite force, and salivary flow will influence the masticatory process. Neuromuscular control of chewing and swallowing also plays an important role in the masticatory process. Relatively large bite forces must be controlled under uncertain conditions: no optical feedback is available and food resistance may largely vary among chewing cycles. Knowledge of the interplay between mastication and sensory experience for groups of individuals is important for the food industry to control quality and acceptability of their products.