

## Taste and Health: New Frontiers in Oral Physiology and Rehabilitation

### Foreword

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Eating and drinking are mostly pleasurable activities and the taste of ingested foods and drinks influence mastication and swallowing. Although the human tongue is able to recognize many different taste substances, there are five universally accepted basic tastes: sweetness, saltiness, sourness, bitterness, and umami taste. At the same time, food ingestion is an essential oral function to maintain our nutritional status. When a person is deprived of the pleasure of eating after aging or stroke, there is a great loss of quality of life (QOL). Tube feeding bypassing the pharynx might be a choice to maintain nutrient status; however, it is a big problem for those patients that desire to take food through the mouth.

The first recognition of food involves taste and smell. Once we considered food to be safe or preferred, we bring it into our mouth. Then, the safety and preference of food is reevaluated by its mechanical and chemical characteristics during mastication. The front teeth is in charge of cutting a certain volume of solid foods that is ground later by the back teeth to produce the food bolus for swallowing. Saliva is not only essential to form the bolus and thus smooth swallowing, but also for tasting. In order to be able to swallow food smoothly, both, the motor control system and the oral sensation are essential. It is well known that patients with dysphasia swallow their favorite food with less risk of aspiration. Since taste is an important reference for the

brain to evaluate the safety and preference of food, it is easy to understand that preferable tastes such as sweet and umami might have a facilitative effect of swallowing initiation.

Today in Japan, 27 million people are elderly (> 65 years), and the elderly population will continue to rise until 2050 when it is expected that one in three people will be 65 years or older. Thus, Japan faces an unprecedented aging society in which the QOL of the elderly is not always satisfactory. In particular, although in the old age people keep the desire to eat delicious food, most of the elderly lose the ability of tasting due to dysfunctions of taste and salivation or diseases, medications, and physiological aging. In particular, during emergency hospitalizations and in nursing homes, to safely feed elderly inpatients suppose a problem when returning to oral intake after enteral nutrition.

A hundred years ago, the new tastant, umami substance (L-glutamate), was discovered in Japan. Since then, Japanese physiologists on taste research have been leading the world establishing the taste physiology of the fifth basic taste (umami). Meanwhile, lines of evidence for the mechanisms of taste perception and taste stimuli-oral/pharyngeal reflex have been accumulated, and now we just begun to apply taste stimuli to improve oral function, such as mastication and swallowing. In this forum, we would like to review recent basic and clinical advancements on medical research of the oral physiology and pharmacology on taste research, including analytical studies of taste substances in food ingredients. We will discuss the importance of eating for our health, and how to solve the problems that come from eating disorders applying the new concept of oral sensory therapy with taste stimuli.

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