Summary

Gustation also referred as Taste is the human act of experiencing the differential strength by the senses spread over on the tongue, along the soft palate and along the lining of the throat through the taste buds. The sense of taste is limited to five basic tastes ie. sweet, sour, salt, bitter and umami. The dimensions of these tastes could be estimated chemically, but their optima in relation to consumer acceptance, preference, especially when they occur in combination in a complex food are not fully understood. The sense of taste is not only associated with taste buds, but also depends on the gustatory cortex at the back of the brain which processes the taste inputs. While, taste of foods is associated with the basic tastes, type of food, type of processing adopted, ingredients used, pre-concept of particular food, age and situation, environmental conditions, cultural conditions and food habits. Under these conditions, the sense of taste and the chemical based stimuli influence the judgment. On the taste of food and its acceptance, the food palatability has a profound effect. The food palatability is determined by taste and other sensory attributes. The taste of food is a complex phenomenon in determining the quality, acceptance and enjoyment cum satisfaction. **Gustatory system** is an amalgamation of sensory organs tongue and its parts papillae, taste buds, gustatory calculi called taste receptors.

In brief, the **anatomy** and **physiology** of the tongue is explained. The tongue is covered Awith thousands of small bumps called papillae and each papilla contain hundreds of taste buds. There are 2000-5000 taste buds which are located on the back and front of the tongue, some are located on the roof, sides and the back of the mouth towards the throat. Each taste bud contains 50 to 100 taste receptor cells. The taste sensation includes five established basic tastes ie. sweetness, sourness, saltiness, bitterness and umami. Taste buds are able to differentiate among different tastes through detecting interaction with different ions. Further, sweet, umami and bitter tastes are triggered by the binding of molecules to G protein-coupled receptors on the cell membranes of taste buds. Saltiness by the alkali metal detection while sourness is perceived when hydrogen ion touches the taste buds. The change in the flow of ions across the cell membrane is transmitted through the nerves to the brain from the electrical signals generated and thus the sensation is felt, expressed, enjoyed and so on. The anatomy and physiology of tongue, papillae and taste buds reflects the structure with their location in the human system. Taste papillae can be seen on the tongue as little red dots, or raised bumps, particularly at the front of the tongue. These ones are actually called "fungiform" papillae, because they look like little button mushrooms. There are three other kinds of papillae, foliate, circumavallate and the nongustatory filliform. In addition, there are 2500 taste buds on the epiglottis, soft palate, laryngeal and oral pharynx. Many of these taste buds are innervated by the facial nerve (VIIth cranial nerve). The number of taste buds declines with age, thereby the taste sensations are not felt. Taste Receptor is a type of receptor which facilitates the sensation of taste. Taste receptor cells are present in taste buds. The supporting cells contain microvillai which appear to secret substances into the lumen of taste bud. There are three **Cranial nerves** that innervate the tongue. These are **chorda tympani nerve** which conducts signals from the front and sides of the tongue; glasso-pharyngeal nerve which conducts signals from the back of the tongue and the vagus nerve conducts taste signals from the mouth and the larynx. The electrical signals generated in the taste cells are transmitted through these nerves. The lingual nerve called trigeminal nerve is deeply interconnected with chorda tympani nerve and it provides all other sensory information from the 2/3 of the tongue. The **mechanism of taste perception** is through transduction process which occur with the help of taste receptors. Each receptor has a different manner of sensory transduction which detects the presence of certain compound and states the action potential which alerts the brain. The standard bitter, sweet or umami taste receptor is a G protein-coupled receptor. The cells that detect sourcess have been identified as sub population of protein PKD 2LI. The saltiness is sensed by the presence of sodium ions. In the transduction process, different substances affect the membrane in different ways. Bitter and sweet substances binds into receptor sites which release other substances into the cell. Sour substances contain H^+ ions that blocks the channels in the membrane. Salty substances break up into Na ions which flow through the membrane directly into the cell. The ion channels for sourcess are ACCN1 and Task-1 while ENac receptor for sodium ions in salt. In 2015, proposed naming for taste of fat as oleogustus. Thus the taste experienced during the eating of food, drinking the liquid form of food is a holistic feeling involved by the tongue, receptor cells, cranial nerves as well as the chemical constitution of the taste ingredients.