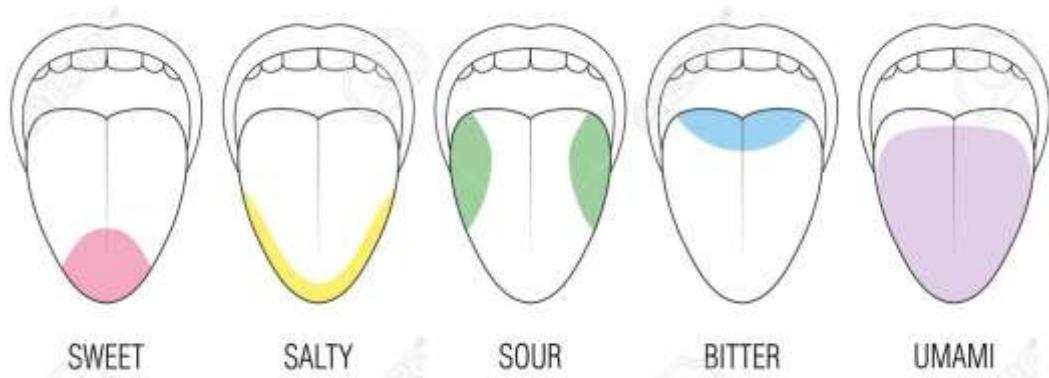


THE PERCEPTION OF TASTE

Taste is crucial for the sensory evaluation of food. This sense allows the detection of essential nutrients and toxic compounds in food items. Human beings are able to discriminate five primary different taste qualities: sweet, umami (the taste of amino acids), bitter, salty, and sour.



The Tongue

The tongue is a muscular organ situated in the floor of the mouth. It is associated with the functions of taste, speech, mastication and deglutition. It has an oral part that lies in the mouth, and a pharyngeal part that lies in the pharynx. The oral and parts are separated by a V-shaped sulcus, the Sulcus terminalis.

Tongue is a skeletal muscle covered by mucous membrane, is divided into symmetrical halves by a septum called lingual frenulum. The tongue can be divided into three parts as follows; root, tip and body. The tip of the tongue forms the anterior free end which, at rest, lies behind the upper incisor teeth. The root is attached to the mandible above, and to the hyoid bone below. The body of the tongue has a curved upper surface or dorsum, and an inferior surface. The dorsum is divided into oral and pharyngeal parts. The inferior surface is confined to the oral part only.

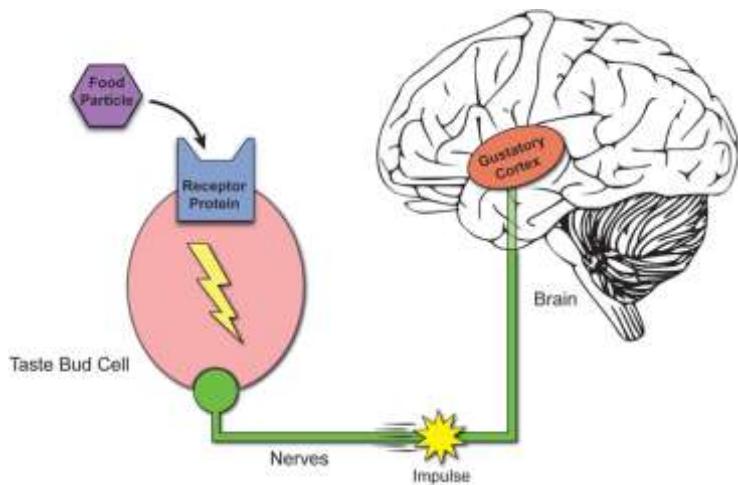
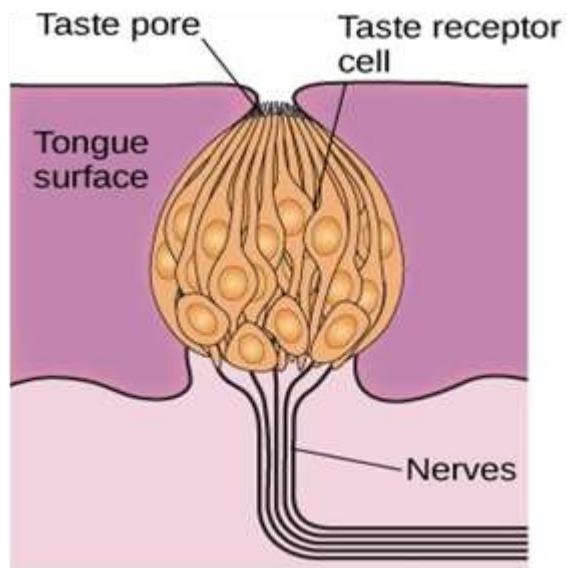
Taste buds

The gustatory system or sense of the taste is the sensory system that is responsible for the perception of taste. Taste is the perception produced when a substance in the mouth reacts chemically with taste receptor cells located on the taste buds on the upper surface of the tongue. The gustatory cortex is responsible for the perception of taste. The tongue is covered with thousands of taste buds called papillae. They are the projections of lamina propria covered with epithelium. There are four types of papillae on the upper surface of tongue. Small, cone shaped Filiform papillae which is numerous in number, club shaped red coloured Fungiform papillae seen mostly at the tip and side, dome shaped Circum vallate papillae seen in front of sulcus terminalis and the Foliate papille on each side of the tongue and at back.

Taste receptors on the tongue sense the five taste modalities they are sweetness, sourness, saltiness, bitterness and umami. Taste buds are able to distinguish between different tastes through detecting interaction with different molecules or ions.

Perception of taste

The taste that we perceive are two phase chemical reaction that involves both our mouth and throat as well as our nose. Our sensation of taste starts with the smell or odors around us that stimulate nerve in a small area located high in the nose and sensation of taste continues as the foods we eat mix with saliva to activate the taste buds. The signal from the taste buds on the tongue to the brain moves between nerve cells through the release of special chemicals called neurotransmitters. The sensory nerve is the nerve of general sensation and the chorda tympani is the nerve of taste for anterior two thirds of the tongue. The glossopharyngeal nerve is the nerve for both general sensation and taste for the posterior one third of the tongue. The posterior-most part of the tongue is supplied by the vagus nerve through the internal laryngeal branch.



The Artificial Tongue

A chemist at the University of Connecticut developed an artificial tongue that analyzes substances and determines taste. The tongue, a platinum electrode coated with two polymers, conducts electrical currents, much like a human tongue. It then charts the results on a graph where analysts recognize patterns as primary tastes. Developers hope the tongue can be used in environmental monitoring, food testing and landmine detection