

# Gustatory Structures Encyclopedia Article

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# Gustatory Structures

Gustatory (**taste**) structures involve the interaction of chemical stimuli in the food or drink with receptors. Gustation enables food to be monitored before it enters the digestive system. Food that tastes objectionable, such as bitter foods that can taste bitter because of toxic contamination, can be discarded before they have a chance to damage the body.

It is often necessary to prepare the food for the taste receptors. The preparation involves the grinding and tearing action of the teeth. As well, the food is exposed a fluid produced by salivary glands located in the mouth. Salivary **enzymes**, such as lysozyme, begin to dissolve the food and help position the food near the taste buds.

Taste buds are chemical receptors buried within bumps (papillae) that cover the surface of the tongue, and on the surface of the palate, **pharynx** and **larynx**. There are about 10,000 taste buds in the mouth. The rough surface of the papillae assists food in sticking to the tongue. Each taste bud has hair-like structures called **cilia** that contain the taste receptors.

The chemical sensory process is rapid, as the sensitivity of taste buds deteriorates rapidly in the presence of **saliva**. Following removal of the food during **swallowing**, the sensitivity of the taste buds is restored.

Four qualities of taste are detected by the taste buds in most vertebrates: sweetness, saltiness, bitterness, and sourness. The sensitivity of the tastes differs with species and buds are lost with age. In humans, the detection sensitivity for taste combinations becomes less with age. Children have very sensitive taste buds, and so often dislike spicy foods. In most children and adults, sweetness is pleasurable.

The taste buds convert the chemical signals to electrical signals, which are relayed to the **brain** via the facial, glossopharyngeal and vagus nerves of the **cranium**.

The different taste buds for sweet, sour, bitter and salty are not spread uniformly over the tongue, but are each confined to specific regions of the tongue. The tip of the tongue is most sensitive to sweet and salty tastes. The back of the tongue along each side is most sensitive to sour tastes. The central part of the tongue, the larynx, the pharynx, and the palate are most sensitive to bitter tastes. Recently, evidence has suggested that another gustatory structure might be the sense of **smell**. The mechanism for the enhancement of taste by smell is as yet unclear.