Smell & Taste

by Sophia

WHAT'S COVERED

In this lesson, you will learn about taste and smell as chemical senses. Specifically, this lesson will cover:

1. Chemical Senses

Taste and smell are **chemical senses**. This means that in order for our brain to be able to interpret a taste or smell, it has to interpret the chemical makeup of the substance that makes the taste or the smell. Chemoreceptors are the receptors that receive sensory information about taste and smell and then relay that information to your cerebral cortex for interpretation.

TERM TO KNOW

Chemical Senses

Special senses that are detected by highly specialized, chemical receptors (olfaction and gustation) that detect dissolved chemicals and gases; olfactory and gustation receptors are encapsulated nerve endings that are embedded with mucous membranes (olfactory) or muscle & epithelial tissues (gustation).

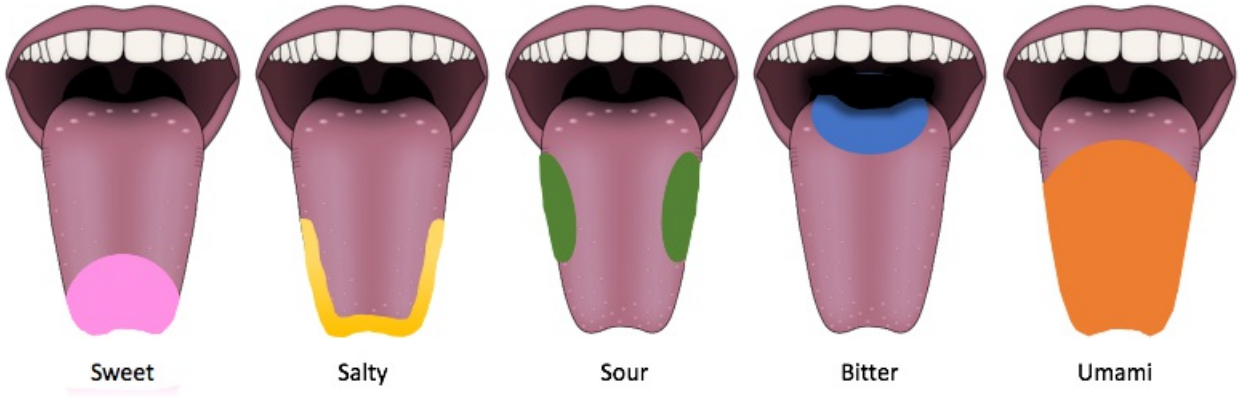
2. Taste

The technical term for taste is gustation. Taste buds are scattered all over in your mouth, not just on your tongue. These taste buds contain **taste receptors**.

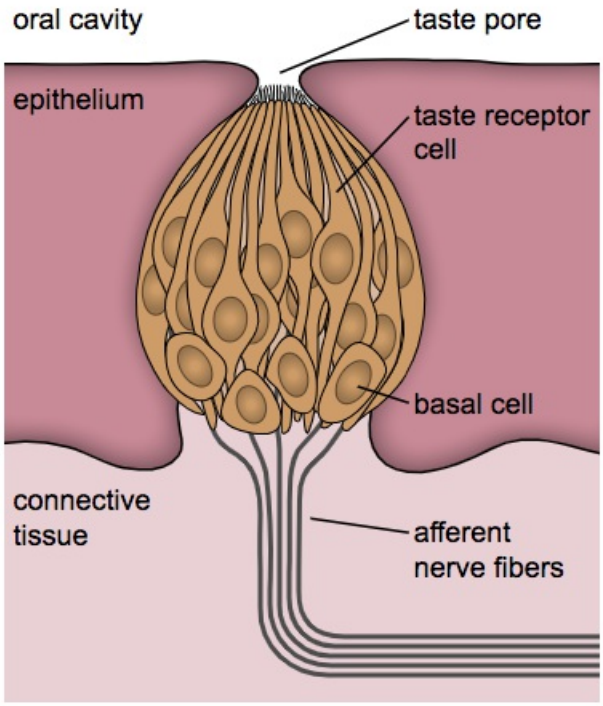
Saliva filled with tasty molecules will enter the pore of your taste buds. If a particular taste bud contains the receptor that matches the tasty molecule (like the lock to a specific key), the receptor will stimulate a sensory neuron, which will relay that information to your brain.

The five common tastes or the five primary tastes that we have are**sweet**, **salty**, **bitter**, **sour** and **umami**. You might be familiar with those first four and can think of something that's sweet tasting, salty, bitter, or sour. Umami taste describes something savory, such as meat. Flavor can be a combination of those five tastes or any combination of those five tastes.

Take a look at the diagram below to give you a better idea of how taste works at the cellular level.



Here you have a picture of a tongue where the five main categories of taste are located. You have sweet on the tip of the tongue, and then you have salty that is found along the edges around the front of the tongue. On the sides of the tongue, you have sour, and then you have bitter towards the back of the tongue. Umami can be tasted on most of the tongue.



You can see the pores on the image; saliva will enter these pores and come in contact with the taste buds, and your taste buds are made up of these taste cells and their associated sensory nerves. These sensory nerves will relay the incoming information about the taste or the flavor to the brain.

TERMS TO KNOW

Taste Receptors

Encapsulated receptors found within taste buds; taste buds are located on lingual papillae on the tongue, in the roof of the mouth and your throat; there are five different tastes that human taste buds are capable of detecting.

Sweet

Foods that are naturally rich in carbohydrates elicit the sensation of sweetness; there are also artificial compounds designed to stimulate sweetness (artificial sweeteners).

Salty

Salty

Foods that are rich in salts/minerals elicit the sensation of saltiness (sodium, calcium salts, etc.).

Bitter

A perception of taste often associated with spoiled or undesirable foods (examples: sour milk, nicotine).

Sour

A perception of taste triggered by acidic foods (example: citrus fruits).

Umami

A perception of taste triggered by amino acids and is often associated with savory foods (example: meat).

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3. Smell

The technical term for smell is olfaction. **Olfactory receptors** located in your nose detect substances that are vaporized or water soluble. Odor molecules attach to those receptors in the nose of the olfactory epithelium, which are found within a layer of tissue in your nasal cavity. The associated neurons will become stimulated and nerve impulses will travel to the olfactory bulbs in the brain. From there, the signal is forwarded to the cerebral cortex, where your brain will then interpret what the smell is. Is it lemon? Is it a pine tree? Is it cotton candy? What is that smell?

IN CONTEXT

If you've had a head cold, you can't taste your food very well. If your nose is stuffed up, you're not getting that input from olfactory receptors, and therefore, it dulls the taste or the flavor of that food, which means taste and smell are very closely linked. In order to be able to taste things, we need to be able to smell.

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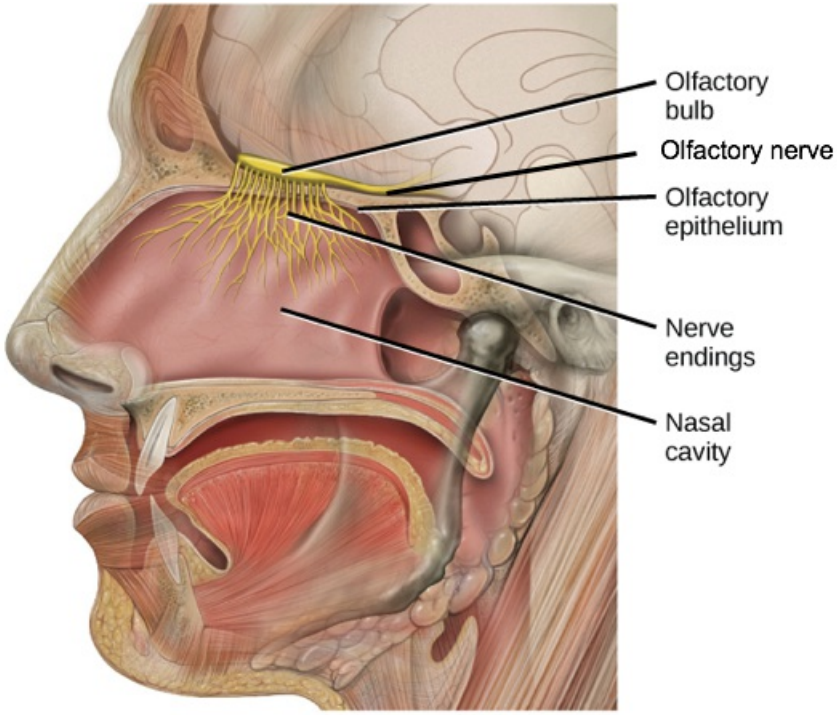

Down underneath there is where you would have the nasal cavity. If you were to inhale and smell the vaporized substance or the water-soluble substance, the odor would enter through your nasal cavity.

Then you have your olfactory receptors, located within the olfactory epithelium. This is where odor molecules would attach, the olfactory receptors go up, and they connect with the olfactory bulb in the brain. Then, the olfactory nerves within the olfactory bulb will carry that information up towards your cerebral cortex.

TERM TO KNOW

Olfactory Receptors

Receptors embedded within the mucous membranes of the nose that are specialized in detecting odor molecules/various odors; encapsulated nerves that synapse with the olfactory bulb on the superior/upper aspect of the roof of the nose.

SUMMARY

This lesson has been an overview on taste and smell as **chemical senses**. Remember, that to **smell** or **taste**, the body must interpret the chemical makeup first.

Keep up the learning and have a great day!

Source: THIS WORK IS ADAPTED FROM SOPHIA AUTHOR AMANDA SODERLIND

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TERMS TO KNOW

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Chemical Senses
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Foods that are naturally rich in carbohydrates elicit the sensation of sweetness; there are also artificial compounds designed to stimulate sweetness (artificial sweeteners).

Taste Receptors
Encapsulated receptors found within taste buds; taste buds are located on lingual papillae on the tongue, in the roof of the mouth and your throat; there are 5 different tastes that human taste buds are capable of detecting.

Umami
A perception of taste triggered by amino acids and is often associated with savory foods (example: meat).