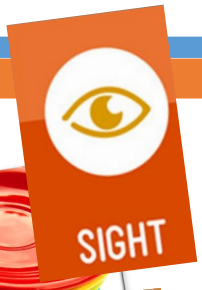
Five Flavors: How the Palate Changes

TASTE

Putting together a meal is more than making the plate look pretty! Taste is connected to memory retrieval. Researchers have found that the experience also lies in satisfying all the senses.

We may also ***hear*** the food we prepare. Our senses open as we listen to cabinets and refrigerator doors open. We hear pots and pans and dishes used for preparing for a meal. We hear cutting and washing of vegetables and other foods. And then comes the smell and taste. Smelling sweet, savory, and spicy alerts the brain that we are preparing to eat something delicious. Beyond sight, tasting brings all the senses together. With tasting, we complete the expectation and taste sweet, sour, salty, and bitter.

SIGHT



Dine-in-the-dark restaurant: Where the food tastes disappointing, but why?

- The color of food can change our perception; e.g. if something is green, it is fresh and has better nutrition
- People perceive that hot chocolate tastes better out of a cream or orange colored cup compared to a different color.
- Research indicates sugar solutions with a reddish hue tastes sweeter like a fruit punch.

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MOUTH WATERING

Like taste, our sense of smell is also closely linked to our emotions. This is because both senses are connected to the involuntary nervous system. That is why a bad taste or odor can bring about vomiting or nausea. And, flavors that are appetizing increase the production of saliva and gastric juices, making them truly mouthwatering.

TASTE RECEPTORS

The tongue map shows more sensitive areas to a particular taste, not the places that exclusively recognize a taste.

All parts of the tongue can sense sweet, sour, salty, bitter, and savory tastes. Taste receptors are also sensitive to umami (the fifth taste) and stress. The back of the tongue is most sensitive to bitter taste which could signal us not to eat.

According to researchers "if you find yourself reaching for sugary foods when feeling stressed, it may be because of stress hormone receptors located in sweet-associated taste buds."

TASTE SEVERAL TIMES AND YOU MAY LEARN TO LIKE BITTER FOODS LIKE BROCCOLI

JUST AS MUCH AS CUPCAKES!

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WHAT ELSE EFFECTS OUR SENSE OF TASTE?

- Aging
- Medication
- Chemotherapy
- Smoking
- Drinking
- Uptick in sugar & sodium intake

At age 30, a person has 245 taste buds on each papilla on the tongue.
By age 70, the number has de-creased to 88!

PERCEPTION OF TASTE AND SMELL

Some people do not like cruciferous vegetables. The smell can cause the brain not to like the taste. To help, try to let vegetables breathe after cooking before serving to improve the smell and perception of taste.

YOUR MOM WAS RIGHT! YOUR TASTE CAN ACTUALLY CHANGE!

Proteins in saliva are regulated after repeated exposure and change – foods like bitter greens or broccoli start to taste better.

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WHAT ABOUT GENETICS?

According to Oregon State University, humans prefer sweet tasting over bitterness. In the past, the perception of taste and smell were protective mechanisms that helped us avoid poisonous foods.

⇒ **Sweet and salty foods**= Energy and micronutrients for a healthy diet
⇒ **Sour & bitter**= Alerted us there was something wrong with the food; it signaled not to eat

These mechanisms are still with us today, except now, the predisposition of sweets leads to extra calories and attributes to obesity and overweight in the U.S. Research from the American Heart Association found a specific gene can make things like vegetables taste bitter, making it less desirable to eat vegetables!

WHAT AND WHO ARE SUPERTASTERS?

Supertasters have more fungiform papillae, commonly called taste buds. They have a more intense experience with foods that contain bitter compounds like kale, broccoli, and Brussel sprouts. Additionally, because they have more papillae, they also have more pain receptors in their taste cells, so they don't enjoy spicy foods as much as non-tasters.

25% of the population are **Supertasters**
50% are **Medium** tasters
25% are **Non-tasters**

Supertasters tend to eat fewer vegetables. Because salt masks bitterness, super-tasters tend to consume more sodium than non-tasters. Supertasters typically avoid alcohol and smoking due to their bitter profiles.

DOWNSIDE TO LOSS OF SMELL & TASTE

- ADDING SUGAR & SALT
- WEIGHT LOSS
- MALNUTRITION
- DEPRESSION
- SOCIAL ISOLATION
- FOOD SAFETY ISSUES

WANT CAN YOU DO?

- Grill or roast vegetables
- Use herbs and spices
- Serve both cooked and raw vegetables
- Use vinegar or lemon juice to season

Developed by: Mary Liz Wright, Susan Glassman, & Lisa Peterson, Nutrition & Wellness Educators. January 2021.

Palate Class: Activity Ideas

Do you taste with your eyes?

Taste buds detect the flavor of food, but do the eyes play a role? In this activity, find out how the eyes can play a role in the enjoyment of food. The appearance of food can dramatically influence personal food preferences.

Materials:

• At least 2 volunteers • A large bottle of apple juice • Blue, green, and red food coloring • 3 disposable cups, one for each color	• 2 glasses of water, one for each volunteer (to cleanse the palate in between tastes) • Marker • Paper • Pen

Directions:

1. Prepare drinks without volunteers watching. Fill each cup with apple juice and label each cup with A, B, and C. Add at least two drops of red food coloring to cup A, two drops of green to cup B, and two drops of blue food coloring to cup C.

2. Ask participants to taste each of the A, B, C drinks, and drink water in between each taste. Ask them to write down which was their favorite and which one they liked the least. Do not allow volunteers to discuss their answers with each other. Give them two to three minutes to taste all three.

3. Have them repeat this activity with their eyes closed. Did this change their mind on preference?

4. Discuss the results. Did the volunteers have the same favorite? Least favorite? If the participants were able to identify that all the beverages were the same, compliment them on their sharp taste perception!

Source: Scientific America, in partnership with Science Buddies.

Test your Senses

Taste test foods while holding the nose closed and blindfolded. The nose is responsible for part of the flavor of food. Try an apple, pear, and potato—Have them identify each without their nose closed and with their nose closed. Make it easier by giving them three options. Repeat this process with baby food or jellybeans since they are all the same texture. See if you can identify flavors! This activity works best when working in pairs.

Materials:

• Blindfold • Baby Food (3-4 different varieties) • Jellybeans *(optional)*	• Apple • Pear • Potato

Source: University of Washington

Can you taste without "tongue juice" (saliva)?

In this experiment, let's learn how important saliva is in taste. Blindfold the participant and have them use a clean paper towel to dry off their tongue. The participant is going to guess if the food tastes salty, sweet, or has no taste. Have them rinse off their mouth and dry off their tongue between tastes. Ask them if they can taste and detect each food.

Materials:

• Sugar, salt, crackers, or other dry foods • Clean paper towels	• Water for rinsing

For food to have taste, chemicals from the food must first dissolve in saliva. Once dissolved, the chemicals can be detected by receptors on taste buds. Therefore, if there is no saliva, you should not be able to taste anything.

Source: University of Washington