

part 1

# vocabulary of flavor





# chapter 1

## the nature of taste



Taste is both a physical and a mental process. It is also a process that differs from person to person. Because of its subjective nature tasting is often a confusing subject to clearly comprehend. This chapter discusses the physical process of tasting as well as its emotional and personal attributes. An understanding of the nature of taste is the first step in becoming an analytical taster. The next step, an analysis of the vocabulary of taste, is presented in Chapters 2 and 3.



### taste: a physical process

Taste is a physical process. We place food in our mouths, chew, and miraculously we “taste” the food. Something happens in our mouth that allows us to experience the flavor of the food we are eating. Although similar in texture, an apple does not taste the same as a pear.

On the most basic level taste begins with our taste buds. Look into a mirror and stick out your tongue. Contrary to what you may believe, the bumps or small dots you see are not your taste buds. They are papillae. A single papillae can hold a cluster of anywhere from 2 to 250 taste buds. Although most taste buds are centered on the tongue, they are also found throughout the mouth.

Each taste bud has a pore in its center. Saliva is vital to the tasting process as it is responsible for carrying taste molecules into the crevices of the papillae and into the central opening of the taste bud. A single taste bud is composed of up to one hundred taste cells. The number of taste cells that people have will affect the manner in which they taste.

Tasters are divided into three groups. These divisions depend on the number of papillae and, consequently, the number of taste cells an

individual possesses. The groups are labeled as tasters, nontasters, and supertasters. To analyze the number of taste cells a person has, researchers swab a small section of the tongue with a blue dye and count the number of papillae that stand out.

Those individuals with a high percentage of papillae are referred to as supertasters. About 25% of the population falls into this category. Supertasters have an approximate density of 165 taste papillae per square centimeter. Children are, for the most part, supertasters. Not only do they have a great density of taste buds, but their taste buds also cover a larger area than those of an adult. A child's taste buds are found not only on the tongue but also on the insides of the cheek and on the soft palate located on the roof of the mouth. This may well explain children's preference for bland foods. When a child says that they do not like a particular item it is often because they taste the flavor much more intensely than adults. Children are also genetically predisposed to like sweet tastes. This is certainly connected to the sweetness of breast milk. This preference for sweet typically decreases as the child reaches adolescence. The term "supertaster" can be misleading. It does not mean that supertasters have an advantage in being able to analyze flavors. Contrarily, supertasters have a great sensitivity to bitter and, to a lesser degree, sour. Thus, most supertasters tend to be extremely picky eaters, enjoying primarily bland foods. Interestingly, more women than men are supertasters.

Compared to supertasters with 165 papillae per square centimeter, normal tasters have approximately 127 papillae per square centimeter. Approximately half of the population is found within this category. Nontasters have about 117 papillae per square centimeter and, like supertasters, about one-quarter of the population falls within this category. Nontasters certainly do experience taste but not to the degree of tasters and supertasters. They tend to enjoy strongly bitter or sour food, as those tastes do not affect them, as they would supertasters. No matter to which category an individual belongs, analytical tasting is an acquired skill, and like any other skill utilized in the kitchen, practice will bring greater proficiency.



## the sense of smell

The physical process of tasting is not only dependent on taste buds, but is also connected to the sense of smell. A large percentage of what we label as taste is actually aroma. Humans are only aware of five tastes: sweet, sour, salt, bitter, and umami (see Chapter 2 for more information on the five tastes) but we are able to detect thousands of aromas. One-day-old infants have been observed to express their unhappiness when offered rot-

ten eggs to smell. Nursing infants are able to pick out their mother by scent alone. The sense of smell is so important to the tasting process that when we have a cold and our nose is stuffed up we declare, “I cannot taste a thing.” It is the decrease in sensitivity to aroma that causes the elderly to feel that they are losing their sense of taste. It is estimated that approximately 80% of those eighty years of age or older have some major loss of smell sensitivity. It is this loss that causes our taste acuity to weaken as we age.

So how does the relationship between aroma and taste actually work? Our olfactory or smell receptors are found in the olfactory membrane located at the top of the nasal cavity. There are almost 100 million of the receptors located at this site. That sounds like a lot until you realize that a dog has over one billion smell receptors. The receptor cells are connected by neurons to the brain. Some are connected to the hypothalamus, which controls appetite and emotions, while others follow pathways to the hippocampus, which is connected to memories.

There are two ways in which an individual can experience aroma, either ortho or retro nasally. An ortho nasal perception of aroma comes from an outside aroma—for example, the wafting aroma that hits your nose when you are presented with a bowl of hot lobster bisque. In this case the aroma is released directly from the food and enters the nasal cavity through the nose.

Alternatively, the aroma from the food can be released as the food is chewed and warmed in the mouth. This is a retro nasal perception of food. The vapors of the warmed food move up the pharynx to the nasal cavities via a retro nasal path. Not all food items will affect the taster’s ortho nasal perception, but all food, as it warms in the mouth, will affect the taster’s retro nasal perception.

## Distinguishing Between Ortho and Retro Nasal Perceptions of Flavor

Prepare a batch of simple syrup. Use 3 parts water to 1 part granulated sugar by volume (1 cup of water to  $\frac{1}{3}$  cup of sugar). Add fresh lemon juice and a bit of zest until the water is lightly flavored. Do not make lemonade! The water should have a noticeable but gentle lemon flavor. Bring the mixture up to a boil and then let cool.

Divide the liquid into two cups. Plug your nose with one hand and sip from cup #1. Pay close attention to the flavor, or lack thereof. Release your nose and notice that you are suddenly encompassed with the flavor of lemon. This is an example of a retro nasal perception of flavor. The vapors produced as the liquid warms in your mouth are pushed up to the nasal cavities through a retro nasal path.

Spray a floral perfume or an air freshener in the air. Make sure that the spray is not lemon scented. I have a lime spray that I use for this

experiment. Lean in and sniff the aroma as you sip from cup #2. Notice that your perception of the liquid's flavor has changed. The clear lemon flavor is lost amid the aromatic perfume. Your perception of the liquid's flavor moves from lemon to lime. This is an example of an ortho nasal perception of flavor. An outside aroma has altered your perception of flavor.

### ***Alternatives to Making a Simple Syrup***

Another way to experience a retro nasal perception of flavor is to taste a scoop of sorbet or ice cream. Notice that the sorbet itself does not have an appreciable aroma. As the sorbet or ice cream warms in your mouth, you perceive the aroma retro nasally and thus, experience its flavor.

Another way to experience an ortho nasal perception of flavor is to sip a cup of beef consommé while leaning over a pot of chicken stock or visa versa. Your perception of the consommé's flavor will undoubtedly change as the beef flavor gives way to chicken.

Taste buds and aroma form the basis for our physical understanding of taste and flavor. Successfully and analytically tasting in the kitchen requires constant awareness of the interrelationship between aroma and taste. It is much like any other skill acquired in the kitchen: it requires practice and concentration. The first step is to come to the tasting with a clean mouth. Drinking coffee, smoking cigarettes, chewing gum or breath mints will all interfere with the way in which you will perceive taste. Although you may no longer be able to taste the coffee, cigarette, gum, or breath mint it is, nonetheless, influencing the way in which you taste. Traces of a breath mint or of a cigarette will remain on your taste buds and affect everything else you taste retro nasally. Therefore, it is important to drink a lot of water and rinse your mouth out often with water or to take a bite of a plain cracker to cleanse your palate between tastes.

Avoid wearing perfume or aftershave, as both will affect your ortho nasal perception of flavor. Avoid tasting a product directly over a hot steaming pot. The aromas released in the steam will affect the flavors you perceive. When tasting a soup, for example, step away from the stove. Also be wary of an ortho nasal perception of flavor when you taste something warm or hot that is going to be served cold. This is especially important when tasting a sorbet or ice cream base, for example.

Be careful of the "painted room syndrome." Think about entering a freshly painted room. At first, the smell is overpowering. After a few minutes, however, the smell seems to dissipate. Someone then enters the room and asks how you can stand the stench. You realize that you are no longer aware of the smell. This same phenomenon occurs when tasting. Consider making a base for fresh ginger ice cream. You have already tasted the anglaise a few times and have added some additional fresh ginger. You are still unsure, however, if the taste of the ginger is strong enough. A col-

league tastes the base and remarks that the ginger flavor is almost overwhelming. You have, in essence, blown out your palate. Just like the freshly painted room, you are no longer aware of the tastes around you. Thus cleansing your palate with water is vital. It is also important to take breaks and to sniff fresh air between tastings (some suggest sniffing coffee beans as a way of neutralizing or cleansing your olfactory nerves). It is also helpful to take several small sniffs of the product being tasted rather than large deep breaths.



## the effect of fat on flavor

Fat plays an important role in one's ability to taste. Fat coats taste buds. That creamy, silky mouth feel that comes from eating something with fat in it is, in reality, clogging up your papillae (along with your arteries). As the papillae become coated with fat, it becomes increasingly hard for the palate to be able to detect flavors. When tasting more than one product, start with the item containing the least amount of fat. If you taste something fatty and then switch to a less fatty item, the fat from the first item will block your taste perception of the second item being tasted.

### Experiencing the Effect of Fat on Flavor Perception

Make a batch of chocolate sorbet and chocolate ice cream (see Appendix for recipe). Scoop out a small portion each of the sorbet and ice cream. Allow both portions to sit out at room temperature for a few minutes so that their flavors can be more readily perceived. Start with the chocolate sorbet. Notice the clear intensity of the chocolate flavor. It starts out sweet and then immediately moves to the bitter astringency associated with cocoa powder. The chocolate flavor, or chocolate essence, is not subtle. It is strong and forthright. Once you swallow, a humming of bitterness remains in your mouth.

Now taste the chocolate ice cream. It too begins with a sweet note. It quickly moves to a silkiness, which is a result of the heavy cream and egg yolks used in the anglaise. Some heavy creams contain as much as 40% butterfat and an egg yolk is composed of approximately 80% fat. While there is a perception of chocolate, it is more subtle than that found in the sorbet. In the case of the ice cream the fat in the recipe smooths out that bitterness. While the ice cream has a chocolate flavor it lacks the intensity of the chocolate sorbet—the fat dulls the bitter astringency.

Think, for a moment, of the flavors as shapes or colors. The chocolate flavor of the sorbet is sharp and jagged while the fat of the ice cream has

rounded out those jagged edges. One is not necessarily better than the other; they are simply different. Do not place a value judgment on either product; simply note the role of fat (or lack thereof) in each.

This point can be further illustrated through clear caramel and classic caramel sauces. (See the Appendix for recipes.) Start the tasting with the clear caramel sauce. The sauce begins with a sweet note, which quickly moves to a slightly bitter caramel taste. Now try the classic caramel sauce. While it too begins with sweetness, it moves quickly into a buttery richness lacking in the clear caramel sauce. The bitterness at the end is barely noticeable in the classic caramel sauce as the fat begins to coat the tongue and its papillae.



## tasting: a mental process

The physical nature of taste is only one side of the coin. Tasting is also a mental or emotional process. Because individuals are distinct and unique, this aspect of taste can easily become confusing. To fully understand and analyze taste, you must become aware of its emotional nature.

Tasting can be an incredibly personal experience. The taste of a particular product often serves as a conduit for an individual's emotions and memories. Taste is often related to the memories of both the physical and emotional environment in which the product was first sampled. For example, when I bite into the first crisp fall apple I am flooded with childhood memories. I remember the excitement of the first day of school; the joy of jumping in a pile of freshly raked leaves, and the feel of approaching winter in the air. The memories come to mind completely unbidden; the taste of an apple is enough to call them to mind.

Because memories differ from person to person, each individual will perceive the flavor of a particular product in a slightly different fashion. Both positive and negative experiences influence the way in which a product's flavor is perceived. These experiences become part of the lenses through which each individual will forever view the world of flavor. Remembering the overcooked liver of one's childhood can, for example, prevent the adult taster from fully enjoying liver's flavor.

The professional chef must be constantly aware of the personal aspect of tasting. It is important to remember that despite the memories that one may associate with certain flavors, there are no inherently good or bad tastes. (This refers to foodstuffs that are nonpoisonous. Many poisonous plants possess an extremely bitter or "bad" taste as a warning system to potential diners.) A chef must be able to separate the qualities of a particular dish from their personal perception of the dish's flavor. "It tastes good" or "It tastes bad" are not remarks that reflect a true analysis of a dish's fla-



vors. As a professional chef, it is important to make the distinction between what is an inferior or improperly made product and a product that we simply, on a personal or emotional level, do not like.

Professional chefs do not have the luxury of making only products they personally like or enjoy. We must focus on whether the flavors work together and whether they make sense. I have created desserts that are very popular with customers although I personally do not care for their flavors. For instance, I hate white chocolate. As a pastry chef I have tasted dozens of white chocolates and while I can appreciate their qualities, strengths, and weaknesses, I personally do not enjoy them. As a professional chef I cannot allow my personal prejudices to lose potential customers. It is, therefore, vital that chefs be aware of the mental component of tasting.



## your individual flavor box

Your flavor box, or flavor personality, consists of your life experiences and their effect upon the emotional aspect of your tasting process. Your flavor box derives from your present environment as well as all of the previous environments in which you have lived. The way in which you taste is an outgrowth or product of these environments. It is part of your flavor personality.

Family often has the biggest impact on an individual's flavor personality. Your family, your town, the surrounding community and region, and the way in which you were raised all join together to form your flavor box. I grew up in the Midwest, surrounded by a family with deep Croatian roots. At home we ate a large variety of Croatian dishes. Throughout my childhood, this style of food was simply part of our family life and I grew up assuming that other families were eating similar foods. I was in middle school before I realized that my schoolmates had never heard of, let alone tasted, dishes like paletchinka (a type of thin pancake filled with cheese and jam), sarma (sour cabbage stuffed with ground pork and veal), or paprikash (a stew rich with paprika, vegetables, and chicken). These dishes were normal dinner fare in our household. Their flavors were subconsciously defining my taste personality, my flavor box.

Your flavor box is not a stagnant entity. Think of it as a box with slightly fluid and constantly moving walls. With each new taste

Consider that a mother's breast milk carries with it the flavors of the foods she eats. Thus, the connection between a child's predispositions to the flavors of his/her childhood begins almost from birth. Some theories also propose that because the flavor of a mother's breast milk will change from day to day, due to variances in her diet, a breastfed child is exposed to a greater variety of flavors than a child who is not breastfed. Some believe that lack of such exposure leads to children who grow up to be picky eaters. To date, no conclusive studies have been done on the long-term effect of a varied diet in a child as he or she matures.

experience the walls of the box are inexorably altered. As an adult my flavor box has expanded beyond my Croatian heritage. I have lived in many different regions of the United States as well as in Europe. These experiences have influenced my flavor box. Each physical change of locale has brought me into contact with new ingredients, new cooking methods, and new ways of tasting foods. All of these factors serve as the foundation for new food memories.

Consider how tomatoes can be made into a sauce in Italy . . . in Mexico . . . in California? Each exposure to new cultures or new ingredients adds depth and breadth to your flavor box. For instance, the Japanese have dozens of words to define the textures of tofu. For most Americans, this is somewhat hard to comprehend; yet such descriptors are inherent to the Japanese flavor box. Tofu, and all its varieties, is intrinsic to the Japanese culture. It is important to be aware of the limits your culture places on your flavor box. Strive to keep your mind and palate open to new taste possibilities, to new ways of expanding your flavor repertoire.

As a chef it is vital to be aware of and able to define all of the components of your flavor box. It is essential to be cognizant of your prejudices, likes, and dislikes, as well as their sources. This knowledge will help to make you a better taster. Perhaps the flavors you have always labeled “good” are, in reality, triggers for positive food memories while the flavors themselves are flat and underdeveloped. You may love the supermarket birthday cakes of your childhood. Each bite brings with it wonderful memories of birthday parties and a table full of presents. In reality, the cakes are usually overly sweet with a waxy, vegetable shortening-laden frosting. The flavor is too sweet and ultimately flat and undesirable; the vegetable shortening coats your tongue and the roof of your mouth. However, since your perception of the flavor is good because of the happy memories it recalls, this sweet flavor is then labeled good in your flavor box. It is therefore imperative that chefs are aware not only of the contents of their flavor box, but also of the emotional and personal context of those flavors.

## Defining Your Individual Flavor Box

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An understanding of your personal flavor box is a vital step in becoming an analytical taster. Start by simply defining and describing your flavor box’s contents. In two columns list the products you like and those you dislike. It is perhaps easiest to start with the extremes. What foods do you absolutely love? Which foods do you hate? Try to establish the reasons behind your preferences and your prejudices. For instance, if you dislike a product is it because of its texture, its flavor, or its association to negative memories? Try to be as specific as possible. Do you like hot, spicy food because it is the food of your childhood? The more detailed and more spe-

cific you can make these lists, the more they will aid in your palate development. I keep my lists and refer to them every six months or so. It helps me to remain aware of my palate development. An awareness of the contents of your flavor box as well as the emotions and memories associated with those contents will help you to differentiate between the actual flavors of a product versus your personal prejudices for or against a particular product. This awareness is vital for all professional chefs.

As you begin to define your flavor personality, your individual flavor box, you may find that there is a difference between the way in which you taste on a personal level and the way in which you taste as a professional or when you are cooking for others. My career as a professional chef has dramatically altered the way in which I taste food. My professional flavor box is much more diverse than my personal flavor box. This may be true for you as well.

Your flavor box is not stagnant; think of its walls as fluid and constantly moving. This is because your emotional and mental environment is constantly changing and evolving. Therefore, each time you taste, that flavor is being placed into a slightly new and altered flavor box. Even if it is a familiar product, there is a new part of the flavor box into which that flavor must be deposited. Thus repetition becomes a vital component of the tasting process and to the development of your flavor palate. Repetition should be applied in the course of one tasting as well as in the overall number of tastings. You can never say, "I know how that tasted, I don't need to taste it again." Repetition and concentration are the most important steps to increasing one's flavor repertoire. Stay alert to nuances and differences between each sampling of a flavor. I can taste the same product a hundred different times, and each time I notice something new, something different. Like any skill in the kitchen, tasting requires constant practice. With practice, the otherwise confusing nature of taste becomes easy to understand. Once you understand the nature and contents of your individual flavor box, you are well on the way to becoming an analytical taster.

