

# The Principles of Healthy Cooking

The food guide pyramids make it clear that a healthy diet contains large amounts of plant foods. For many of us, this means a drastic change in the way we think about foods. A typical American meal has come to mean a large portion of meat, poultry, or fish at “the center of the plate,” with smaller “side” portions of vegetables and starches, but this type of plate composition is at odds with what the pyramids tell us.

Based on the combined knowledge of dozens of professional chefs, dietitians, and foodservice professionals, and on the lessons of the pyramids, The Culinary Institute of America has developed a set of principles for healthy cooking that features the capture and amplification of flavor as the primary directive and unifying theme. These guidelines are an invitation to think about the foods you select, the cooking techniques you use, and the types of beverages you offer. They are not ironclad rules. Instead, they should be regarded as ways to explore the possibilities of flavor and healthy cooking.

## The Seven Principles of Healthy Cooking

1

**Select ingredients with care.** (CHAPTERS 4, 5, 6, 7, 9, 10)

Design menus to include a large variety of ingredients.

Emphasize high-quality ingredients.

Use fresh, seasonal produce in menu planning when reasonable.

Explore nontraditional ingredients for providing the function and flavor of traditional high-fat, high-sodium ingredients.



2

**Store and prepare all foods with the aim of preserving their best possible flavor, texture, color, and overall nutritional value.** (CHAPTERS 4, 5, 7, 8)

Control temperatures carefully in receiving, storage, preparation, and service.

Select and execute fundamental cooking techniques properly to ensure quality finished products.

3

**Incorporate a variety of plant-based dishes on the menu in all categories.** (CHAPTER 4)

Shift the emphasis toward grains, legumes, vegetables, and fruits.

For inspiration, look to traditional ethnic cuisines that are predominantly plant-based.



## 4 Manage the amount of fat used both as an ingredient and as part of a preparation or cooking technique. (CHAPTER 5)



Opt for unsaturated vegetable oils whenever possible and reduce the use of animal fats.

Select lean animal products and trim visible fats.

Use fat-dense foods (cream, butter, cheeses) sparingly.

Explore nontraditional, low-fat ingredients and methods.



## 5 Serve appropriate portions of foods. (CHAPTER 11)

Size portions to reflect the recommendations of the food guide pyramids.

Monitor overall menu balance; individual menu items may vary from the established guidelines as long as the entire menu is nutritionally balanced.

## 6 Use salt with care and purpose. (CHAPTER 6)

Explore a variety of seasonings, preparation methods, and cooking techniques to reduce reliance on salt.

Emphasize clean, distinct, assertive flavors.

Use higher-sodium ingredients sparingly to add flavor.

Incorporate contemporary sauces, such as juices, salsas, and reductions, to increase flavor.

## 7 Offer a variety of beverages, both alcoholic and nonalcoholic, that complement the food menu. (CHAPTER 9)

Make the beverage menu as varied and interesting as the food menu.



To begin cooking for good health, we have to revise the way we think of meals and shift our focus to those foods that once were relegated to the side. The major challenge in such an undertaking is the preservation of flavor. When meats, dairy products, and other high-fat or high-sodium foods are pared down and no attempt is made to compensate for this change, healthy foods can be bland and unappealing. The good news, though, is that healthy food is not synonymous with boring food; if anything, it means exciting and flavorful food.

The chapters in this section expand upon these guidelines, offering practical solutions for putting them into effect. Chapter 3 is devoted to flavor, from how we sense it to how we can capture and develop it. Chapters 4 through 7 explore the ingredients that are of concern to the health-conscious cook—plant foods, fats, salt, and sweeteners—and suggest strategies for either increasing or moderating their use.

Chapter 8 covers the world of beverages, from the connection between heart health and alcohol to cooking with alcohol to promoting the beverage menu. Chapter 9 demonstrates how to apply cooking methods in order to capture flavor and promote health. Lastly, Chapter 10 discusses current trends in agriculture that affect the selection of ingredients.

CHAPTER THREE

# The Elements of Flavor



Good cooking is the art of capturing the most appropriate flavors in a dish. The first step in mastering this art form lies in understanding exactly what constitutes flavor.

Flavor is composed of many elements. It begins with high-quality ingredients and is amplified through preparation and cooking techniques. All five of our senses provide us with perceptions that, when taken collectively, become “flavor.” This chapter explores flavor by breaking it down into its components. The five senses of flavor are examined first, followed by a discussion of how flavor is perceived and how it can best be captured. Lastly, to ground theory in reality, one of the recipes from this book is analyzed to illustrate how it captures flavor.

## Seeing Flavor



Brilliant pan-steamed  
sugar snap peas

Imagine you are dining in a restaurant. When the food is placed before you, one of the first senses that gives you flavor clues is sight. Bright, vivid colors please the eyes. You expect that the foods will be as flavorful as they are colorful. Colors hint at freshness as well as cooking techniques. For example, you expect vibrantly green sugar snap peas to taste from-the-garden fresh and slices of orange sweet potato bearing grill marks to have a sweet, slightly smoky taste and a dense, melting texture.

A juicy-looking piece of chicken hints at succulence and starts the mouth watering. Foods that are bubbling or steaming let you know that they are piping hot. Height adds another dimension to the plate and makes it appear more interesting. Just by looking at the plate, you already know a great deal about how the food will feel and taste, even though you have yet to actually touch it.

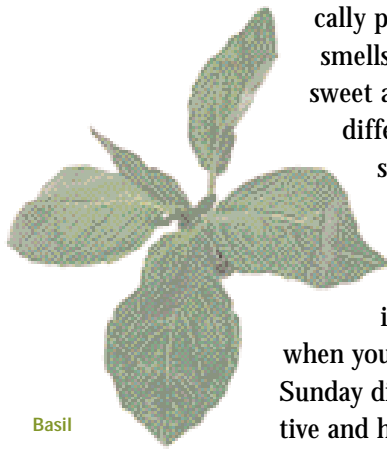
## Hearing Flavor

At the same time that you taste with your eyes, you become aware of the sounds that the food is making. A sizzling platter of fajitas, the snapping and popping of a breakfast cereal newly doused in milk, and the fizzing of a glass of

champagne all send flavor clues. When tucking into a crispy-looking, golden piece of herb-breaded baked chicken, you expect that first bite to be accompanied by a hearty crunch. If the coating turns out to be quietly soggy, you will most likely feel disappointed, even cheated somehow, regardless of the actual taste and aroma.

## Smelling Flavor

Of course, you are keenly aware of the wonderful aromas wafting your way from the moment the food is placed before you. When you taste the food, you meet these aromas head-on. The sense of smell plays an enormous role in our perception of flavor, as anyone who has ever had a head cold knows all too well. In fact, aroma is perhaps the primary component of flavor. While we are able to physically perceive a few basic tastes, we are able to distinguish among hundreds of smells. For example, an orange and a tangerine share the same basic tastes of sweet and sour, but in a blind taste test most people are still able to tell the difference because each fruit has a different set of characteristic aromas and slightly different textures.



Basil

The aromas of foods also have a powerful association with memories, both good and bad. Many of us have probably had an experience in which an aroma instantly transports us back through time, awakening memories of our first introduction to that particular smell. Perhaps when you smell a chicken roasting in the oven, you find yourself reminiscing about Sunday dinners at Grandmother's house when you were a child. If this was a positive and happy time in your life, then you may think of roast chicken as a "comfort food." But one aroma may lead to a string of connected memories; if Grandmother always served overcooked broccoli with her chicken and you were always forced to finish every bite, then the smell of a roasting chicken may not be something you're particularly fond of.

## Feeling Flavor

When you touch a food with your fingers or with a utensil, you receive a preview of its texture. A piece of poached salmon that softly flakes away under the gentle prodding of a fork hints at the tenderness of the fish. A steak that resists your most insistent sawing tells you that it is dry and lifeless and ought to be sent back to the kitchen. Part of the pleasure in eating comes from feeling the foods in your mouth as you chew and in how long those foods fill your stomach, making you feel satisfied.

## Tasting Flavor

When you chew and swallow the first bite, you experience the full flavor of a dish. What we typically think of as “taste” or “flavor” is actually the interaction of taste and smell, combined with the feel of the food in the mouth. Our sense of taste comes from the chemical receptors, referred to as taste buds, on our tongues. It is

generally accepted that taste buds are tuned to receive four primary tastes: sweet, salty, sour, and bitter. However, some researchers believe that there are other categories of taste, such as the metallic taste and the savory, meaty taste known by the Japanese word *umami*. Additionally, the insides of our mouths feel such sensations as, for example, the burn of hot chiles, the cooling effect of mint, the astringency of tannins in tea or wine, the numbing sensation of cloves, and the fizz of carbonated beverages.

The temperature at which foods are served affects our ability to perceive tastes. According to Harold McGee, in *On Food and Cooking*, we are most sensitive to taste in the temperature range of 72° to 105°F. McGee further states that sweet and sour sensations seem to be enhanced at the upper end of this temperature range, while salty and bitter tastes are more pronounced at the lower end.

Good chefs intuitively know this to be true, because from experience they have learned that foods served very cold, like ice creams and terrines, need to be especially flavorful or highly seasoned.

A classic example of this dichotomy is potato-leek soup. When served hot, the sweetness of the leeks tends to stand out over the thick, creamy potato base. The same soup served cold, as vichyssoise, is refreshingly salty, and the starchy quality of the potatoes is more apparent.



Chiles add a “burn.”

## The Subjective Experience of Flavor

Taken as a whole, sensory impressions form the overall flavor profile of a particular food or dish. However, flavor perception is enormously subjective because people vary in their ability to sense and interpret flavor cues. Dining experiences are also often colored by the diner’s expectations of the meal. The environment in which the meal is consumed, the language used on the menu to describe the food, the occasion of the meal, and the health and mood of the diner all affect the quality of anticipation the diner brings to the table.

Even though no two people are likely to experience the same foods in the same way, we have nonetheless been able to arrive at a common understanding of the way in which flavors relate to one another in order to compare and contrast them in a meaningful way. Many people describe new flavors in terms of more





The complexity of  
caramelized sugar

familiar flavors (“Tastes like chicken to me”). On a more abstract level, some chefs find it useful to place flavors on a “musical scale,” with base notes and top notes and middle-range notes representing specific flavors. Others find it more meaningful to liken flavor combinations to art, with the individual flavors standing in for the colors that the artist blends on his or her palette and then applies to a canvas with brush strokes of varying form and intensity.

Classifying flavors in a series of flavor ranges is another method of visualizing the relationships that flavors have with one another. The aromas of foods can be said to range from deep, rich, and dark (chocolate, for instance) to bright and perfumed (a ripe strawberry). An individual food can exhibit a variety of characteristics from several areas of this spectrum. Vanilla, for example, has an extremely complicated array of aromas. Tastes can be classified according to the basics (bittersweet, sweet, and sour). Textures come in ranges from soft to hard, tender to tough, creamy to grainy, and so forth.

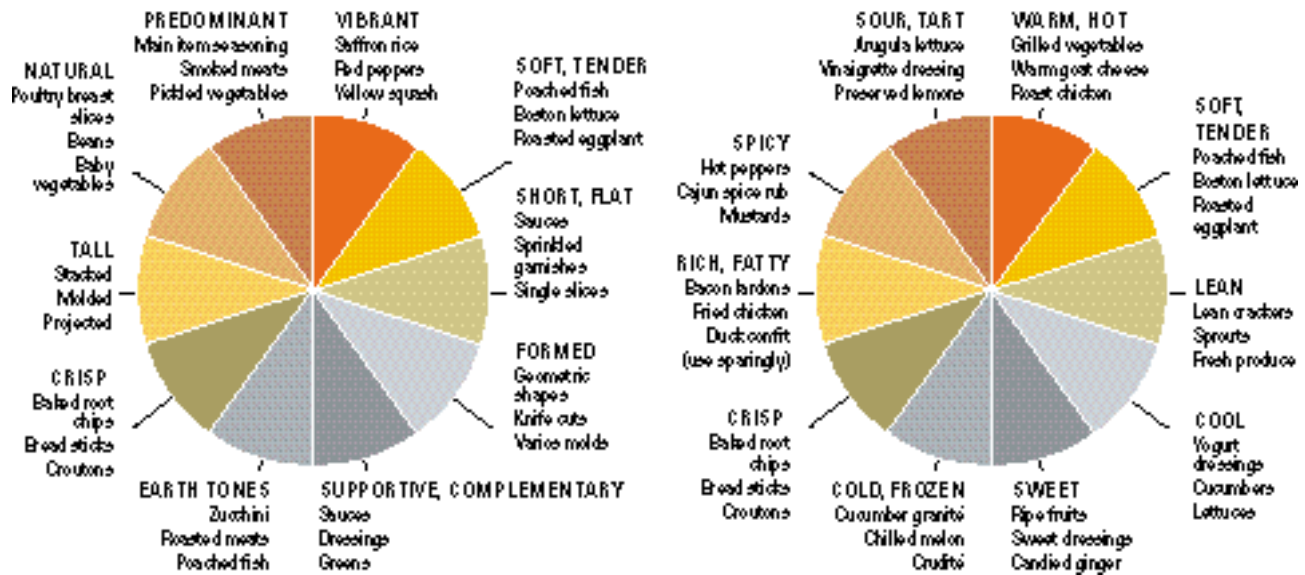
A food’s overall flavor profile can thus be said to range from simple to complex, depending on how many individual flavor elements it exhibits. A simple sugar syrup, for instance, is clear, simply sweet, and does not have any aroma. When that same sugar syrup is allowed to caramelize, though, it takes on several extra dimensions. Depending on how it is cooked, the color can range from the lightest to the darkest of browns and the texture can be grainy or smooth. The taste expands from simply sweet to sweet, bitter, and sour, and it has all of the sweet, warm aromas that we know to be characteristic of caramel.

## Deconstructing Flavor

Because flavor is so subjective, no standard formula exists for developing flavors in foods. However, by visualizing flavor in terms of flavor ranges, we can begin to deconstruct individual dishes in order to gain an understanding of flavor relationships and learn how to create pleasing flavor combinations.

The first thing to consider is what attributes each ingredient contributes to the overall flavor profile of the dish. Take one of your favorite recipes and ask yourself why each ingredient is there. For many ingredients, the answer is obvious, but for others, the function may not be immediately clear.

Balance is something that we often assume to be the ultimate goal in the creation of pleasing flavor combinations. This is not always the case, however. Colors, sounds, textures, tastes, aromas, and temperatures can either complement or contrast



3-1 Composition wheels are menu design tools that identify various elements to consider when designing a dish. They can be used for any menu category; the wheel on the left is for appetizers, the right for composed salads. Contrasting elements are shown on opposite spokes.

with each other, as illustrated in Figure 3-1. Sometimes perfectly complementary flavors are desirable, as in the case of a slowly cooked lentil stew. Here, balance *is* the goal because the desired result is the melding of several ingredients into a singular taste experience. Other times, though, the chef may wish to highlight a particular flavor. In this case, contrasting flavors can be used to let one or more elements come to the forefront of the flavor profile. Pesto, for instance, showcases the flavor of fresh basil or other herbs and uses the contrasting flavors of garlic, pine nuts, Parmesan cheese, and olive oil to round out the flavor profile.

Timing is another important element of flavor relationships. When we cook, we add different ingredients at certain times to maximize flavor and ensure that each ingredient is cooked just enough. Onions, garlic, and some spices are normally added at the beginning of the cooking process, with a touch of oil or fat, to develop their sweetness and allow their flavors to permeate everything else that is eventually added to the pot. Fresh herbs, on the other hand, are often added to foods shortly before serving to allow their aromas and colors to really stand out.

By adding ingredients in a certain sequence, we create a layering of flavors. Consider the recipe for Tenderloin of Beef with Wild Mushrooms on page 310. The beef medallions first are dry-sautéed and removed from the pan. A sauce is then “built” by adding fond de veau lié to release the bits of meat that are left in the

pan into the sauce. The mushrooms are added next so that they can release their essence into the sauce. Aromatic components—fortified wine, fresh herbs, and pepper—are added just before serving so that their volatile compounds are not lost to prolonged cooking. Finally, the stewed leeks are stirred in, giving yet more flavor and texture to the dish.

When we eat this dish, we perceive each of these flavors in nearly the opposite order. First, the bright aromatic quality of the herbs and the spiciness of the pepper become apparent, quickly followed by the darker earth tones of wine, leeks, mushrooms, and fond de veau lié. At the base of all this is rich, meaty beef. This inverse linear quality of flavor perception is one of the key elements in composing successful recipes.

The amount of time that a flavor lingers on the palate after we have swallowed also influences our perception of the dish's overall flavor. We refer to this as the flavor "finish." Consider, for example, a clear soup versus a puréed soup. The clear soup has a lighter and cleaner finish than the thick and creamy puréed soup.

The time that elapses between the initial preparation of foods and when they are actually eaten also affects flavor. Some foods, such as delicate vegetables, fish, and sautéed meats, are best immediately after they are cooked because the quality of their flavor, texture, and nutrient content begins to degrade quite quickly. Other foods, like soups and braised dishes, benefit from being prepared a day or so before they are to be eaten. The extra time allows their flavors to fully mature.

Finally, temperature can be used to add an unexpected element to a dish. We generally tend to separate hot foods from cold foods to keep the two temperatures from canceling each other out, but by serving hot and cold foods together, an interesting contrast can be created. In cuisines where food is often spicy, this is a time-honored tradition. For example, in Indian cuisine, a mango lassi (mangoes, yogurt, spices) might be served as a beverage with a fiery pork vindaloo and spicy mango chutney. Some of the ingredients are similar and several are the same (mango, spices) but the temperature and creamy quality of the chilled drink provide a cooling counterpoint to the hot and spicy pork dish.

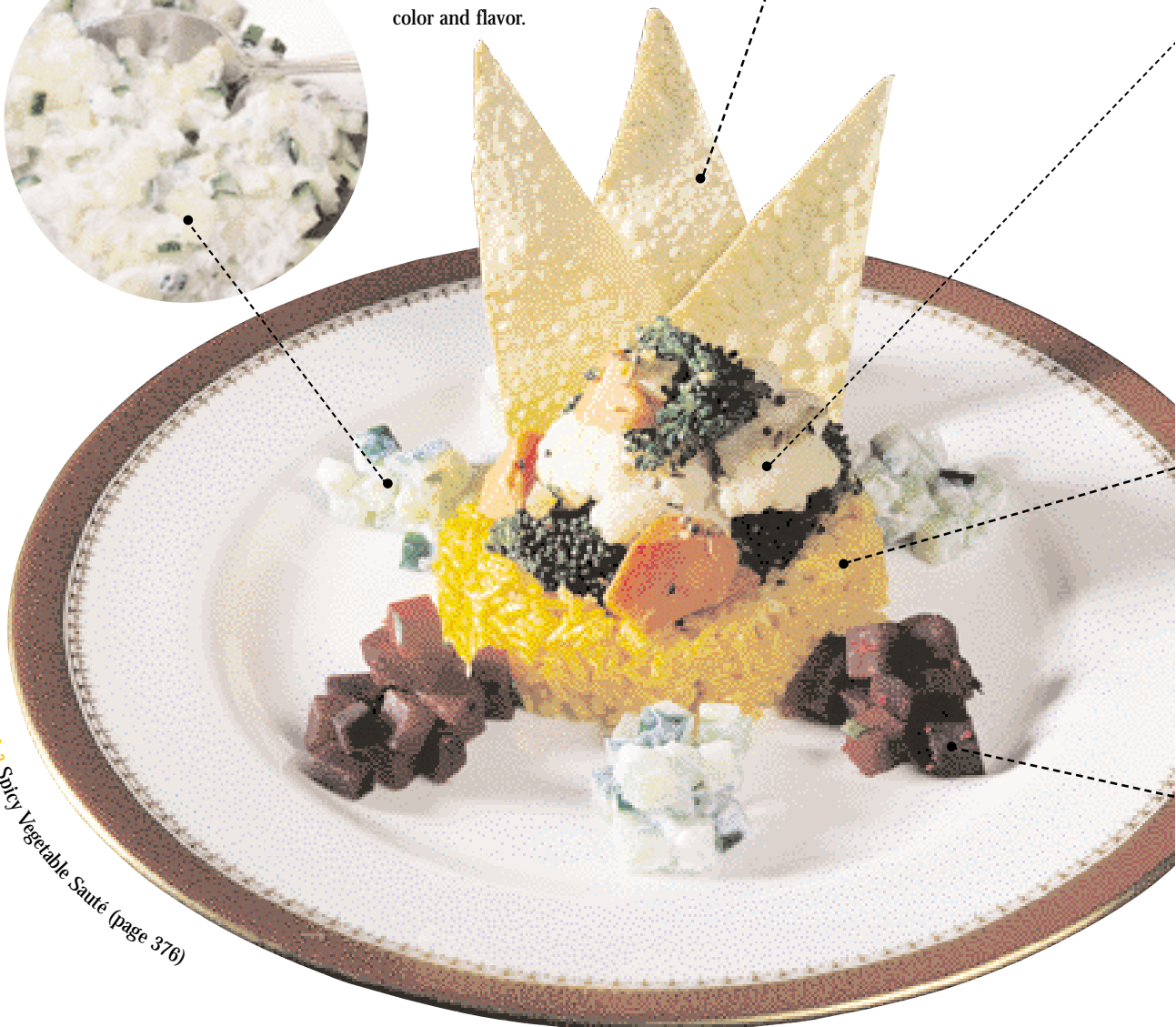
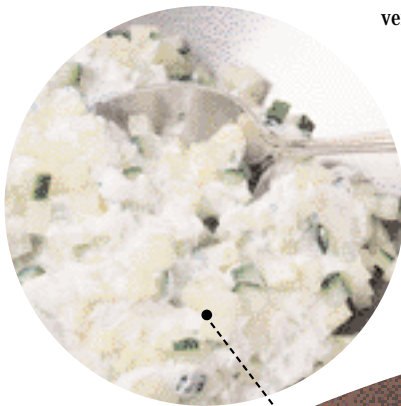
## Case Study in Flavor Deconstruction

Now that we have developed the theoretical tools necessary to the deconstruction process, we can apply them to a real example. The Spicy Vegetable Sauté with saffron rice, cucumber raita, and beet chutney, shown in Figure 3-2, is a vegetarian entrée with an Indian flair (recipe appears on page 376). Because of its contrasting elements—spicy hot vegetables, cool raita, piquant chutney, and mellow rice—this dish is a riot of flavor and color.

# Case Study in Flavor Deconstruction

**The Crisp** The four main ingredients in this dish provide a full range of flavors and colors but, texturally speaking, the dish needs another element. The rice and raita are soft, the vegetables tender. Something crunchy is needed. Because the dish is of Indian inspiration, a serving of the crisp lentil-flour flatbread *pappadam* is a good accompaniment. Although often deep-fried, pappadam can also be cooked on a griddle or grill. In addition to being a healthier choice, the grill gives the pappadam a smoky flavor.

**The Raita** Raita is a classic Indian condiment served with spicy hot foods. The coolness of the cucumber and the yogurt quenches the fire of the chiles. In this version, the peel is left on the cucumber for color and flavor.

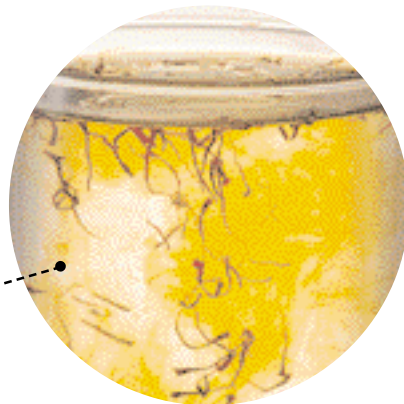


3-2 Spicy Vegetable Sauté (page 376)

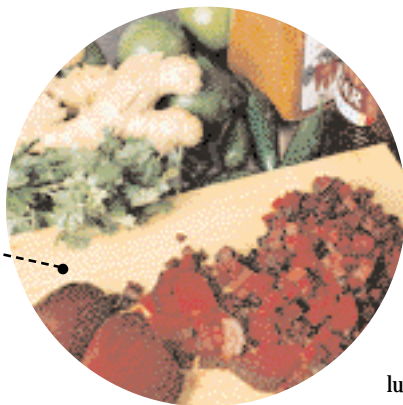


**The Vegetables** The main component of this dish, the vegetable sauté, is a good example of flavor layering. Because the vegetables are dense, they are parcooked by steam, a quick method that cooks the vegetables evenly and retains their nutrients well. The first step in the sauté is to toast mustard, black onion, and cumin seeds in clarified butter until they begin to pop. Toasting the seeds in fat magnifies and releases their flavors into the fat, where they become readily available to the palate and can be distributed evenly throughout the sauté. Once the seeds have toasted, the vegetables are added and sautéed just long enough for them to brown lightly and absorb the flavors in the fat.

The last step is to add the spicy, aromatic ingredients—fresh ginger, garlic, hot chiles—and cook them just long enough that they begin to meld with the vegetables but retain their individual character. Ginger and jalapeño also appear in the beet chutney, which creates a flavor bridge between the two.



**The Rice** The starch component of this dish is fragrant, nutty basmati rice scented with the unique flavor of saffron. Rinsing and soaking the rice before cooking rids it of excess starch and allows the grains to expand, yielding cooked rice with fine, separate, springy grains. The saffron is infused into the cooking liquid to release its flavor and aroma before the rice is added. The result is a beautifully colored and highly flavorful backdrop for the vegetables.



**The Chutney** Roasting rather than boiling the beets is the key step in preparing the chutney. By keeping the beets out of contact with water, none of the flavor, color, or nutrients is leached away. The dry oven heat also slightly caramelizes the beet sugar, creating a more complex flavor. After roasting, the beets are diced and tossed with pungent ingredients such as fresh ginger, jalapeño, and lime juice. The snappy brightness of these fresh ingredients provides an intriguing contrast with the lush sweetness of the beets.

## Summary

Good flavor begins with high-quality ingredients. It is developed and enhanced through preparation, cooking technique, and the manner in which the food is served.

All of our senses contribute to our perception of flavor. In addition to taste and smell, we also see, hear, and feel flavor. The experience of flavor is highly subjective, affected by differences in people's ability to sense and interpret flavor cues and in their expectations for the meal.

Several variables affect our perception of flavor. The combination of ingredients, the timing involved in preparing the food, the order in which ingredients are added during the cooking process, and the final serving temperature are some of these variables.

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