Chapter 8  Cooking Methods

The Key to Understanding and Mastering Recipes

8.1 We eat with our 5 senses, so cook with the 5 senses:

- Cooking by **sight**, **smell**, **taste**, **sound**, and **touch** allows you to cook the food to just the way you like it.

- **Time estimates specified in the recipes are not always the best guide: They do not necessarily apply to all situations since cooking conditions will vary depending on the type and materials of utensils and stoves.** Different materials in cooking utensils: aluminum, carbon steel, copper, non-stick, composites, ceramic, etc. Different types of stoves: gas electric, infra-red, induction, etc.

- **Cooking by sight:** vegetables turning a vibrant, brighter green; vegetables and meat browning when caramelized; pasta turns translucent (or less opaque), fish turns opaque; rapid, large bubbles mean boiling, whereas small, slow bubbles mean simmering, etc.

- **Cooking by smell:** cooking is also about bringing out the aromas from the ingredients - smell the aromatics, herbs, and spices as they cook.

- **Cooking by sound:** the sizzling of the food tells you the pan is hot enough to vaporize the moisture rapidly, using ingredients with crunch adds to your eating experience etc.

- **Cooking by touch:** vegetables turn soft, proteins firm up when cooked. Control your preferred doneness by feeling the food with your spatula or chopstick, and if you prefer, with a **clean** finger. This will take practice and you will get better at it over time.
• **Cooking by taste**: Taste the marinade, stock, and sauce as you are making it.

  o **Do not taste marinade that has raw meat, poultry, or seafood inside.**

  o If you want to use leftover marinade on cooked items, first cook the marinade to decrease the risk of getting sick from a food borne illness.

  o How can you tell when the food is done and ready? Pick up a piece from the pan and taste!

### 8.2 Get organized:

- Work with the least clutter on your cutting board and work area.
- Keep your work surface and ingredients dry.
- Wipe and clean as you go – have kitchen towels (cloth and paper) handy.

### 8.3 Pay attention to Time and Temperature

- Figure out the steps before you start – estimate how long each step would take.

- When instructions says “high heat”, make sure the pan is hot enough (place your hand a few inches above the pan as it heats up and before you put the ingredients in).

- Use a thermometer to check doneness according to the appropriate internal temperatures for different types of protein. (See Minimum Internal Temperature chart in Ch.9).

- Never leave any uncooked meat, poultry, seafood in the temperature danger zone (between 41°F – 135°F) for more than 4 hours.
8.4 Maximizing use of each ingredient - Reduce Waste, Stretch your Budget

- Stems of green and leafy vegetables are sweet and full of nutrients. Peel the fibrous skin of broccoli stems and slice them to add to the sauté.

- Bones add flavor to stocks and soups.

- Use leftover spaghetti sauce in a lasagna or a pizza using flat breads/tortillas.

- Left over rice are best for fried rice.

8.5 Knife Skills = Efficiency

- Well practiced knife skills saves prep time and produces cuts of vegetables and meat best suited for each cooking methods.

- Use the right tool for the right job: big knife for big job, small knife (paring knife) for small job.

- Use the appropriate cut for different cooking methods to break down fruits, vegetables, fish, meat etc. (see the companion Fruits and Vegetable Cuts photos and video clips).

- Good knife skills ensure safe knife usage. (See Chapter 9 for knife safety practice).
8.6 What happens when food is cooked? The useful and interesting science of creating great flavors and healthy dishes

- **Cooking is both an Art and a Science** – Cooking involves physics, chemistry, and biology.

- Cooking is about changing the nature of protein (denaturing) and plant cells.

- Cooking is about the interaction of hot oil, water, acids, alcohol, etc.

- Cooking is about the chemistry of developing natural sugar from the ingredients.

- Cooking is about emulsifying (thickening), dissolving, coagulating (what happens to the proteins in meat and egg when cooked), extracting (flavors come from the oils of herbs and citrus extracted during cooking).

- Cooking is about utilizing and managing the sodium, sugar, and fat in all the ingredients used in the recipe.

- Cooking is about measuring and conversions between volume and weight.

- Cooking is about the logic of steps.

- Cooking is fun!
8.7 Let the oil and water do the cooking

*Oil is essential for cooking and creating flavors.* Food cooked with not enough oil will turn watery and soggy. While there is concern about consumption of oil, there are techniques for removing the oil after it has done its job in the cooking process.

- **What actually cooks the food is the oil and water**, not the pot or pan as it is often assumed.

- The cooking utensils do not actually “cook” the food, but are the vehicles for heating up the oil, water, or air to carry the heat to the entire surface of the food being cooked. Vegetables and meat come in all shapes and sizes, with nooks and crannies that can only be reached by the liquid (oil, water) to ensure even cooking.

- The objective of the cooking process is to **transfer heat** (conduction) from the source of heat in the stove (gas fire, electric elements etc.) to the food – through oil (sautéing, pan frying), water (poaching, steaming, braising), or air (baking and roasting).

- Use **poly-unsaturated oil** (vegetable oil, corn oil, safflower oil, sunflower oil, grapeseed oil) or **monounsaturated oil** (olive oil, canola oil, peanut oil) for healthier cooking. Many oils have a combination of poly and monounsaturated oils.

- **Reducing the oil in the dish:**
  - **Lift the food from the pan** onto the serving plate, instead of pouring it in. Leave as much of the cooking liquid, which contains a fair amount of the oil used in the cooking in the pan. Leave as much of the cooking liquid (which contains a fair amount of oil used in cooking) in the pan. Drizzle some, **but not all**, of the liquid over the food as a sauce.
  - Use a **slotted spoon** to remove food from the pot or pan.
  - Place fried food on a paper napkin to help soak up extra oil drippings from the food.

- **Deglaze:** while the food in the pan is hot, add a liquid (water, a stock, or a broth), or alcohol (explained in a following section) to remove the oil from the surface of the food. Adding the liquid after the vegetable and/or meat is two-third cooked. The liquid also dissolves the caramelized sugar residue on the bottom of the pan to add flavor.
8.8 Concentrating flavors

- Cooking is about concentrating flavors from the fresh and dried ingredients.

- All vegetables and meats contain water. The techniques used in cooking are aimed at driving out some of the water and minimizing nutrient loss from food during cooking. There is always nutrient loss with cooking.

- Some of the water is left to keep the food succulent (juicy), and for developing the sauce.

8.9 Caramelizing means bringing out Sweetness

- **All meat and vegetables contain certain amount of sugar.** Vegetables contain natural sugar. Meat is mostly protein but it does contain a small amount of sugar that caramelizes with dry heat cooking methods (roast, broil, sauté). After the water is cooked off, the sugar develops, caramelizes, and turns brown as cooking continues.

- **Meat –** When meat is cooked, the protein denatures in the heat, reacting with the sugar and turns brown (called the “Maillard Reaction”). The browned meat, together with the **brown residue in the pan are the source of flavor**.

- **Vegetables –** Vegetables that contain high starch content such as many root vegetables (potatoes, carrots), as well as natural sugar that caramelizes and form a brown crust (or leave a brown residue in the pan) when the sugar is cooked. Farm fresh vegetables brought to market soon after they are harvested are sweeter as they are able to develop higher sugar content when given adequate time to ripen at the farms.
8.10 Marinating

- Marinades are usually made up of these components: seasoning (salt, pepper), acid (citrus-lemon, lime juice; wine, vinegar), oil, and herbs (fresh or dried), flavouring agents (sauce).

- The acid helps to partially denature the meat's proteins, opening up "tunnels" in the meat structure where flavor can seep in.

- But marinades mostly penetrate only the surface. Marinades work best on meats such as chicken breast and fish, because the muscle structure is not as dense as it is in steak.

- For denser meat, marinades work best when the meat is cut into smaller pieces so the marinade can penetrate a larger surface area.

- If marinades are left on too long, the acids can "cook" the surface, causing the meat to dry out and becomes tough.

- Different time for different ingredients: Some meats, such as larger cuts of pork and steak, can marinate for hours, and even overnight. Other less dense cuts of meat, such as chicken breast and most fish, or sliced meat, only need to stay in a marinade for a short time.


8.11 Oil and Fat carry Flavor

- Cooking animal protein with oil brings out better flavor.

- Fat is an energy source stored in animal muscles. It contributes to the flavor of meat.

- Most of the flavor-carrying, or aroma, molecules are repelled by water (hydrophobic), but they dissolve in the fat and oil.

- Only a little oil is needed to start the cooking process with meat. As the animal protein cooks, its fat is rendered into oil to carry on the cooking process.
8.12 Cooking with Alcohol – a healthy and flavor enhancing technique

- Common wines for cooking: red, white wine, sherry, Marsala, sake (Japanese rice wine), Shaoxing wine (Chinese rice wine), fortified wine (port, brandy).

- The alcohol in the wine cooks off during the process.

- Wines are made from grapes or grains, and contain sugar, which adds flavors.

- **In the marinade:** wine contains acids that tenderize the meat, and natural sugar that adds to flavor. Acid also increase the sensation of savoriness or saltiness. **This is one of the techniques for enhancing flavors without adding salt.**

- **Deglazing:** adding a small amount of alcohol (usually half way or later in the cooking process) to

  1. “wash off” the oil from the surface of the food being cooked by breaking it down into smaller globules.

  2. draw out the sugar from the caramelized residue on the bottom of the pan or the caramelized aromatics (garlic, onion, shallot) and add depth to the flavor profile.

8.13 Cooking Methods* for Tasty and Healthy Dishes

**Matching the appropriate methods for different ingredients** will allow you to:

- Bring the best flavors and goodness out of the ingredients
- Preserve the maximum nutrients in the ingredients
- Save time and effort
- Reduce waste and maximize usage of all your ingredients
- Save money and stretch your budget
- Find opportunities to involve and teach children and teens to cook.

*The following sections describe the cooking methods for vegetables, meat, poultry and seafood that best preserve the nutrients. It is not meant to be a comprehensive description of all cooking methods. The primary focus is on cooking vegetables. These methods are recommended because they are efficient, practical for home style cooking, and allow better control of the amount of oil used and consumed for healthy cooking.*
• **Sauté**

  - This is a dry heat cooking method.
  
  - Sautéing only requires a small amount of oil. The oil conducts the heat from the pan to the food.
  
  - Recommended for vegetables, tender cuts of meat, chicken breast, medium to firm fish, and seafood.
  
  - Sauté means “jump or bounce”, and refers to the tossing action of food in a pan.
  
  - This quick cooking method minimizes nutrient loss and brings out the full flavor of vegetables for a tasty healthy dish.
  
  - Use a pan that is large enough for the food to spread out. If the pan is too small or the food is stacked up, then the food will steam, become water-logged (soggy), and not sauté. The food can also be sautéed in batches.
  
  - Use canola, olive, or coconut oil for sautéing. The oil can be flavored with aromatics (garlic, shallot, onion, ginger etc.) before adding the vegetables and/or meat.

  - **Heat the pan until it is hot, then add the oil.**

  - If the oil is not hot enough or if the oil is added to a cold pan, then:
    - The food will stick to the pan and possibly burn.
    - The food will absorb more oil and be greasy and higher in fat.

  - **Toss gently, turn, and coat the food with a thin layer of the hot oil** so it is covered evenly. **Let the oil do the cooking!**

  - After the food is sautéed, remove it from the pan and drain off the excess oil.

  - Fillet of fish or meat can also be sautéed. Allow the fillet to cook evenly on one side before flipping over. Deglaze the remaining brown bits with wine, broth, or stock, then reduce the liquid to make a sauce.
(Sauté continued)

- **Stir-frying is a form of sauté** mostly referred to Asian cooking, where small slices or chunks of vegetables and marinated meat, poultry, or seafood are continuously stirred in a wok (traditionally used) or a sauté pan at a high temperature.

- **Non-stick pans are not ideal for sautéing** because it cannot be heated to a high temperature. Non-stick pans should be heated with oil on the pan to prevent it from being damaged.

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**The Health Benefits of Cooking with Oil**

The oil helps your body to absorb fat-soluble vitamins (Vitamin A, D, E, K) in food to support good health.

- Vitamin A from beta-carotene food sources: carrots, broccoli, sweet potato, leafy green vegetables
- Vitamin D food sources: salmon, tuna, fortified milk
- Vitamin E food sources: vegetable oils, nuts, seeds, avocado, spinach
- Vitamin K food sources: leafy green vegetables

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*Watch the companion video clip on sautéing vegetables.*
• Poaching

  o This is a moist heat cooking method.
  
  o Recommended for vegetables, fish, or chicken
  
  o The food is completely surrounded by liquid and cooked on a low temperature to help minimize moisture loss.
  
  o The poaching liquid can be water, or water with flavouring agents such as fresh or dried herbs, aromatics (garlic, ginger, lemon grass etc.), a little salt and pepper, or a stock/broth (chicken, beef, vegetable, seafood/fish stock).
  
  o Make sure there is enough liquid to cover the food.
  
  o When poaching vegetables, add 2-3 tablespoons of oil to the poaching liquid. This helps to coat the vegetables with a thin film of oil to reduce leaching of nutrients.
  
  o Bring the liquid to a boil then add the food.
  
  o As soon as the food is added, turn the heat down to medium low or low. Watch for slow or “lazy” bubbles to gently simmer the food. The food item should not roll around in the pot. Leave the pot uncovered so you can monitor the temperature easily (covering the pot will raise the cooking temperature).
  
  o The food gently cooks in the liquid at a low temperature. If the vegetables roll around or bump into the pot then this causes further damage to the cell walls and even greater leaching of nutrients into the liquid.
  
  o While this method takes a little longer than boiling, it allows for careful control of doneness, and minimizes the chances of the food being overcooked.
  
  o A sauce can be added to the food item after it is plated. For vegetables, drizzling a little sesame oil, or oyster sauce (or both) would suffice. Make sure you do not slather the vegetables with the sauce. The sauce is meant to enhance the natural flavour of the food, not to overcome it.

  Watch the companion video clip on poaching vegetables.
• Roasting

  o It is a dry heat method.

  o Most recommended for sturdy or root vegetables (potatoes, sweet potatoes, yam, carrots, cauliflower, asparagus, Brussels Sprouts), beet, large portion of meat, poultry, or whole fish.

  o The food can be roasted in an open pan or wrapped in tin foil.

  o **Roasting in an open pan allows vegetables to caramelise and develop a deep sweet flavor.** Cauliflower and Brussels Sprouts taste great when roasted in an open pan (toss in a little olive oil, salt and pepper first).

  o **When food is wrapped in tin foil, it steams** and does not allow the vegetables to caramelize. Therefore, flavouring agents such as fresh herbs, citrus slices, and sauces are added inside the foil wrap to enhance the flavor of the food.

  o Marinate poultry and meat for a few hours before cooking to tenderize and flavor the meat. Basting frequently throughout the roasting process keeps the food moist.

  o For whole poultry birds, stuff the cavity with fresh herbs and season the skin or under the skin before roasting.

  o For meat and poultry, use a roasting rack underneath the food to allow fat to drip down into the pan. Turn the food item over halfway through the process to assure even cooking.

  o Roast until desired doneness using a thermometer. **The food will continue to cook after you remove it from the oven. Let the meat or poultry rest for 15-30 min to allow juices to redistribute.** This will make it easier to slice and result in a juicy piece of meat or poultry.
• **Grilling and Broiling**

  o This is a dry heat method that uses very high direct heat.

  o Most recommended for root vegetables (potatoes, sweet potatoes, yam, carrots), cauliflower, beet, asparagus, small tender cuts of meat, poultry, fish fillet/steak or whole fish.

  o Grilling is similar to broiling. In **grilling**, the heat comes from an open flame below the food. In **broiling**, the heat comes from the heating elements inside an oven above the food.

  o Grilling or broiling brings out a **distinct caramelized flavor** in foods. However, when food is wrapped in tin foil and grilled, it steams and does not allow foods to caramelize. Therefore, flavouring agents such as fresh herbs, citrus slices, and sauces are added inside the foil wrap to enhance the flavor of food.

  o When meat is grilled, the fat shrinks faster than the meat and will cause the meat to curl up. Before grilling, cut excess fat off meat to keep the meat flat and to prevent curling.

  o The fat rendered during grilling drips down into the flame, which causes the fire to flare and burn the food. Place a rack or broiling pan underneath the food to catch the fat drippings and help prevent the meat from burning.

  o Brush the food with a mixture of oil, salt, pepper, spices, and herbs before grilling or broiling.

  o Marinate poultry and meat for a few hours before cooking to tenderize and flavor the meat. Basting frequently throughout the cooking process will help keep the food moist.

  o Turn the food a quarter turn to create 90 degree angle grill marks.

  o Grill vegetables until lightly browned.

  o Brush glazes, BBQ sauce, or other sauces onto meat or poultry after it’s at least halfway cooked on both sides. Otherwise the sugar in glazes and sauces will burn if cooked too long. Use glazes and sauces sparingly to enhance the flavor of the food, not to overcome it!
• **Steaming**

  - This is a moist heat cooking method and a quick way to cook vegetables. Steam from the cooking liquid heats the food quickly. It is a healthy cooking method for vegetables since it retains most of the vitamins and does not require any oil or fat.

  - **Vegetables that are dense and sturdy are best suited for steaming**, such as broccoli, cauliflower, carrots, potato, sweet potato, beets, artichoke, squash, asparagus, Brussels sprouts, sugar snap peas, and green beans.

  - The key to creating tasty steamed vegetables is seasoning and flavouring the vegetables.

    - Adding flavors before steaming:
      - add herbs such as minced garlic, ginger to the vegetables, or
      - toss vegetables with olive oil, salt, pepper with the minced garlic
      - toss with sesame oil, soy sauce, and pepper with the minced garlic and/or ginger.

    - Adding flavors after steaming:
      - squeeze lemon or drizzle olive oil or sesame oil or vinaigrette over vegetables, or
      - sauté garlic and onion to top off the steamed vegetables on the plate.

  - Use a flavoured cooking liquid to enhance the flavor of vegetables during the steaming process.
    - Stock or broth with wine and aromatics
    - Water infused with aromatics and herbs
    - Water with miso or soy sauce

  - **Over-steaming vegetables** also washes away seasonings that may have been added prior to steaming and **destroys heat sensitive B vitamins and vitamin C**. (Boiling vegetables results in even greater losses of B vitamins and vitamin C due to the leaching out of these vitamins via osmosis so it is not recommended at all.)

  - The key to keeping the bright colors and firm, crunchy texture is **limiting the cooking duration to a minimum** according to the maturity and thickness of the vegetables. Most vegetables steam and cook within minutes.

  - Steam the vegetable whole or cut the vegetables into small even pieces. If some pieces are significantly bigger then the smaller pieces will overcook and be mushy.
o Green leafy vegetables are thin and delicate, hence requires a very short steaming time. Asian leafy green vegetables are traditionally sautéed. (see sauté cooking section).

o Green vegetables contain chlorophyll, which gives it their bright green color. Cooking green vegetables too long also affects the color since prolonged heat and acid will destroy chlorophyll. When vegetables are cooked it releases an acidic gas called sulfur. Sulfur is released into the air in cooking methods such as sautéing and poaching. However, in steaming, the sulfur remains in the pot and will eventually turn bright green vegetables into a dull olive color if the vegetables are steamed too long.

o Do not add acid such as lemon juice or vinegar during the steaming process otherwise the bright green color will discolor and turn into an olive or yellow greyish color. Leaving green vegetables in an acidic dressing for a long time will also produce an undesirable color.

o On the other hand, adding an acid to red or white vegetables will help to retain their bright color during the cooking process.

o If vegetables are steamed with just water, then season the vegetables before steaming and/or add a sauce after it is plated.

o Fill the pot with 2 inches of cooking liquid. Boil the liquid then add the vegetables to the steamer basket or colander and cover.

o Do not add baking soda to the cooking process as that will make the vegetables slippery and lose vitamins.
- **Approximate steaming times**: (times will vary depending on thickness of the vegetable and desired texture)

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<thead>
<tr>
<th>Vegetable</th>
<th>Steaming time</th>
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<tbody>
<tr>
<td>Artichokes</td>
<td>20-45 min</td>
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<tr>
<td>Asparagus</td>
<td>2 min. for pencil or young and thin asparagus, 4-5 min for thicker matured asparagus</td>
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<tr>
<td>Beets</td>
<td>30-45 min</td>
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<tr>
<td>Broccoli</td>
<td>place sliced stalks into steamer first for 2 min, then add florets and steam another 5 min</td>
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<tr>
<td>Brussels sprouts</td>
<td>5 min</td>
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<tr>
<td>Carrots</td>
<td>3-5 min (sliced or cut)</td>
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<tr>
<td>Cauliflower</td>
<td>place sliced stalks into steamer first for 2 min, then add florets and steam another 5 min</td>
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<tr>
<td>Corn on the cob</td>
<td>8-10 min</td>
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<tr>
<td>Green beans</td>
<td>10 min</td>
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<tr>
<td>Kale</td>
<td>4-5 min</td>
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<tr>
<td>Potatoes</td>
<td>10-15 min (sliced or cubed ½ inch thick), 20-45 min (whole)</td>
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<tr>
<td>Sugar Snap Peas</td>
<td>5 min</td>
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<tr>
<td>Spinach</td>
<td>2-3 min</td>
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<td>(or other thin leaf vegetables)</td>
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