Moist Cooking Methods

COOKING FOOD IN LIQUID is an essential culinary skill. Liquids tenderize tough meats, add flavor to food, and bring out vibrant colors in vegetables. In addition, foods cooked by moist-heat methods tend to be inexpensive or moderately priced. There are several similar yet different ways to cook with moisture, and knowing which application goes with which food is essential for great results.

Objective:

Analyze the methods and uses of moist-heat cooking.

Key Terms:

blanching
boiling
braising
collagen
connective tissue
dry-heat cooking methods
elastin
fricassée
moist-heat cooking methods
parboiling
poaching
pot-roasting
simmering
steaming
stewing

Understanding Moist Cooking Methods and Uses

Moist-heat cooking methods are techniques used with tougher cuts of meat and with sturdy root and fibrous vegetables to break down their tough connective tissue and fiber. Methods include blanching, parboiling, boiling, poaching, simmering, steaming, braising, stewing, fricasséeing, and pot-roasting. For most moist-heat cooking processes, the cooking liquid does not exceed 180°F. Moist-heat methods typically require the cook to frequently skim the scum from the surface of the hot liquid, especially during the early stages of cooking. Scum (brownish, gray material) floats to the top of the pot due to blood and other impurities being driven from the bones and flesh. Skimming ensures a clean tasting dish.

In contrast, **dry-heat cooking methods** are techniques used with tender cuts of meat and vegetables with little fiber and are the transfer of heat to food from above (broiling) or below (grilling) or from dry heat surrounding the food (e.g., roasting and deep frying). Dry-heat cooking methods do not use liquid, but they may use fat or oil. Dry-heat methods include sautéing, pan-frying, stir-frying, baking and roasting, broiling, deep fat frying, pan-broiling, and skewer cooking.

PARTIAL MOIST-HEAT METHODS

The moist-heat method utilized will depend entirely on the selected food. Blanching and parboiling have different purposes as well.

Blanching

Blanching is a partial moist-heat method similar to parboiling in which food is briefly covered in boiling water or fat to remove an outer skin or covering (e.g., an almond hull; tomato or peach skin). The process generally requires 10 seconds to 1 minute, depending on the food size and the goal of the blanching. In contrast, parblanching is placing food in a large amount of cold water, bringing the pot to a boil (uncovered), and simmering it for a specified amount of time. Heating of the food via blanching must be stopped immediately after removing the food from the liquid or fat. Food items removed from boiling water are immediately placed into an ice water bath to quickly cool the food and stop the cooking. Blanching is often accomplished in water, but a flavorful liquid of almost any type (e.g., stock, wine, or oil) could be used.

Parboiling

Parboiling (to **par**tially cook) is a technique that involves plunging food into rapidly boiling liquid for a very short amount of time to retain and set color, preserve nutrients, and firm foods (especially vegetables). If the food item is to continue cooking, cooking does not need to be halted, as in blanching.

MOIST-HEAT METHODS

All methods are not created equally. One food will have excellent results with a method that would destroy another food item. So foods must be matched with appropriate moist-heat methods, such as boiling, poaching, simmering, steaming, braising, pot-roasting, stewing, and more.

Boiling

Boiling is cooking in a liquid that has reached 212°F (boiling point). Specifically, boiling water should be a full "rolling, churning" boil, with lots of breaking bubbles and clouds of

steam, as opposed to a few clusters of bubbles rising in the liquid. Boiling is often accomplished in water, but a flavorful liquid of most any type could be used. Although the liquid for boiling does not have to be water, it would not be oil because as oil heats, it smokes and may begin to burn.

Because liquid is denser than air, it is a better conductor of heat than air, making boiling a fast cooking method. However, there is the potential to overcook some foods and to damage other foods by boiling. Also, when water is drained from boiled foods, the color and nutrients are apt to be lost.

FIGURE 1. Boiling requires that the food be submerged in liquid that is fully moving, bubbling, and steaming—a rolling, churning boil. Notice that the fusilli pasta is added to a rolling boil.

Poaching

Poaching is a delicate cooking method conducted in a small amount of barely simmering, calm liquid—140° to 200°F—and held there until the food is fully cooked. It is a type of simmering process. When held at the correct temperature, the poaching liquid will not bubble. Instead, the liquid shudders and may show bubbles at the bottom of the pan, but the bubbles do not rise. Delicate foods (e.g., raw fish and raw eggs) are fully submerged in a hot liquid (standard poaching) or are held just barely below the surface of a liquid that is about one inch deep (shallow poaching). Both types of poaching result in the same level of cooking, but the effect is the same. Again, the liquid does not have to be water, but it would never be oil.

FIGURE 2. Poached foods can be completely covered with a liquid (standard poaching), or (as shown in this image) they may be cooked in a small amount of liquid (shallow poaching).

Simmering

Simmering is cooking food in a liquid held just under the boiling point—140° to 185°F. Simmering liquids exhibit some motion. A few bubbles rise to the surface, but it is not a full

rolling boil. It protects fragile foods and helps tenderize tough foods. It is one of the most important cooking techniques for a young cook to learn, as it is an important step in braising, fricasséeing, stewing, and pot-roasting as well as in making soups and sauces. Many foods can be simmered, but that does not mean they are being poached. Any food being held hot on a stove at low heat with moisture present (e.g., heating soup, stew, canned vegetables, potatoes, and pasta) would be simmered, not poached.

Steaming

Steaming is a cooking process in which food items are placed above boiling water or other liquid (e.g., wine, stock, and herb-flavored water). It is the even and moist heat of the steam—not the simmering or boiling water—that allows food to retain its natural juices, nutrients, and color. For the steaming process to be the most effective, the water must be at a full rolling boil, and the cooking unit (pot or pan) should be fully enclosed to keep the steam trapped inside the pot or pan. Also, the water level should be about 1 inch below the level of the steamed food. Steaming uses less liquid than boiling. Steamer types include a perforated base placed over a pan that fits perfectly, a tiered steamer, a large bowl standing in a pan of boiling water that comes halfway up the side of the bowl, a compartment steamer (e.g., stainless steel or bamboo), and a pressure cooker.

DIGGING DEEPER...

UNCOVERING ADDITIONAL FACTS: Connective Tissues

Virtually all mammals have connective tissue throughout their bodies, and there are several types of this tissue. When it comes to cooking, the focus is on elastin and collagen. Elastin is called "silverskin" by chefs and butchers because of its "silverfish shiny" appearance. These tissues are profoundly strong structures that surround muscles (meat) and are often attached to bones, allowing the animal to use the muscle to move the bone (e.g., walking, and running). Elastin never tenderizes, no matter how long it is cooked. The only way to deal with it is to cut it off and discard it or physically pound it or grind it (as for cube steak or ground beef). When it is included in ground meats, they tend to be tough even though they are ground.

Collagen, on the other hand, does break down and melt during long, slow, moist cooking. All three elements—long, slow, and moist—must be present to tenderize the meat. Collagen can be found on the inside of muscle tissue as well as on the outside; it often resembles fat.

Connective tissues directly increase in volume the more the animal uses the muscle, explaining why cows have more than calves, why sheep have more than lambs, etc. In fact, aside from the age of the animal, specific sections of the animal develop more connective tissue than others based on how much each muscle group is used. Cuts such as the shank, chuck, and round are the least expensive because they are the toughest. Yet they can be the most delicious if cooked appropriately.

To learn more about connective tissue, check out this website:

http://www.exploratorium.edu/cooking/icooks/11-25-02.html

As fast as boiling cooks food, steaming is even faster because the temperature of steam is much higher than that of boiling water. Shorter cooking times save energy and keep more nutrients in the food rather than washing them out in boiling water. Steam is a requirement for cooking in a conventional floor-mounted steamer or pressure cooker, where steam is held in an airtight environment, pressure builds, and foods cook quickly. *NOTE*: It is necessary to lift the lid of a stovetop steamer away from the body or to stand to one side of a floor-mounted steamer in order to protect the hands and arms from scalding as a result of the steam.

Braising

Braising is a combination of roasting (dry-heat cooking) and steaming (moist-heat cooking) foods in a vegetable-seasoned liquid. The vegetables include the aromatics (carrots, celery, and onions) and may include mushrooms, parsley, and/or shallots. The small amount of liquid may be wine, stock, water, tomatoes, or the cooking liquid from the braised food or other foods that complement the braised food. Typically, large roasts or pieces of meat are braised, as compared to stew that typically utilizes bite-size chunks of meat. Before the braised food is placed in the oven, the mixture is brought to a boil on the stovetop. The very slow covered roasting, at about 300°F, supplies the braised food with steam for basting and a condensed and flavorful liquid for sauce. When the food is removed from the braising pan, the residue is deglazed, defatted, and prepared as a flavorful sauce. Braising is arguably the most flavorful of all the moist techniques and requires the preparer to be vigilant about the details and process. Braised foods are sometimes prepared in a Dutch oven with a tight-fitting lid.

Pot-Roasting

Pot-roasting is a cooking method for tougher cuts of meat; it is a combination of frying and steaming and requires a heavy pan—a very similar technique to braising. The process is usually accomplished on the stovetop over a very gentle heat and generally results in less shrinkage than with other moist-heat methods.

Stewing

Stewing is a method of slow cooking by moist heat in which small, bite-size pieces of meat, fish, or poultry are browned and then simmered with vegetables and a small amount of liquid to cover in a closed (or partially closed) pot. For meats, the food is browned on top of the stove

FIGURE 3. Stewing is typically done in a pot on the stove; braising is more commonly done in a pan in the oven. Both require a lid, low heat, a liquid, and a long time to cook. This image is a beef stew.

before the vegetables and liquid are added. The liquid is brought just to a boil before being transferred to the oven. Stewing can be accomplished on the stovetop, in the oven, or in a slow cooker. There are exceptions to the use of the terms. For example, a "stewed chicken" is still whole. **Fricassée** (frik eh' see) is a ragout (loosely defined as a type of "white stew") typically prepared from white meats or poultry and white sauce. The meat is lightly browned and then treated as a "white stew."

Miscellaneous

Other types of moist-heat cooking are wrap cooking (e.g., papaya, lettuce, cabbage, and grape leaves), slow cooking (slow cooker), clay cooking, foil cooking, en papilotte (paper wrapped), and en croute (pastry wrapped).

FOODS BEST SUITED TO MOIST COOKING METHODS

The type of cooking method you use depends on the natural tenderness (or vegetable), the amount and type of connective tissue, the leanness, and the size and thickness of the meat.

Blanching

Blanching is a specific cooking method with very specific results, and only certain foods benefit from the process. The process involves quickly cooking in boiling water or steam followed by a cold bath to stop the cooking process. The primary uses are to ease skin and hull removal; enhance and set color prior to cooking or freezing; and retain nutrients (that would typically be lost during boiling).

Fruits and Nuts

Delicate fruits with thin skins (e.g., tomatoes, grapes, peaches, and plums) and nuts with hulls (e.g., almonds and hazelnuts) are blanched to assist with the removal of the outer skin or hull without damaging the fruit or nut inside. Blanching is an especially useful technique when the use of knives or peelers is not a viable choice due to high waste of the flesh or nutmeat. Blanching causes the skin to separate a bit from the flesh. Fruits with thick skin are unaffected by blanching. If the fruit is firm enough to peel with tools, blanching is unnecessary.

Vegetable and Fruit Colors

Vegetables (e.g., broccoli, corn, carrots, and pea pods) benefit from blanching to make their colors "pop" to a vibrant hue. Restaurants and other foodservices blanch vegetables prior to service, which partially cooks them, to speed the process of serving them at mealtime. Professional chefs want vegetables to look their best. If the blanched vegetables were overcooked just prior to plating, the color would be gray; the texture would become mushy; and the nutrients would be depleted.

Freezing raw fruits and vegetables typically results in their colors darkening or appearing drab upon thawing. Yet blanching fruits and vegetables prior to freezing enhances and protects their strong, vibrant colors. The brief cooking process locks in the color but has no affect on the texture. Upon thawing, some produce will still be "mushy." Blanching is not recommended for very delicate fruits and vegetables (e.g., alfalfa sprouts, bean sprouts, raspberries, and blackberries) because it does not enhance the color, texture, and nutrients of delicate produce.

Oil

Blanching in oil is common for starchy vegetables, such as potatoes that would be frozen and fried at a later date. Blanching in oil protects the color prior to freezing and assists with the crisping of the vegetable when it is fried at a later time. Remind students that blanching is a technique. However, when done in oil, it is not a moist cooking method; oil is considered a "dry" ingredient.

Fat Reduction

Some meat, especially poultry with liberal amounts of fat attached to the skin, benefits from blanching. For example, German and Chinese chefs blanch duck to partially separate the skin from the meat on the whole bird and to allow the fat to better drain during cooking. Blanching allows for a less greasy final product and much crispier skin.

FIGURE 4. Blanching makes it easy to remove tough skin from delicate fruits and vegetables, such as these Italian tomatoes, without damaging the flesh.

Boiling

Boiling is a technique that may be used with almost any food, but the results are not appropriate for all foods. Rather than adding color, boiling typically removes color from food. Boiling may remove nutrients, and overcooking is common, leaving foods mushy. When applied appropriately, boiling is a great cooking method for many foods, with strong tenderizing properties.

FIGURE 5. Boiling cooks and tenderizes meats, such as this whole chicken. However, boiling may leave some foods looking bland and unappealing on the surface.

Foods that are well suited for boiling are tough cuts of meat (e.g., corned beef brisket, ribs, and chuck roast); hard and fibrous vegetables (e.g., potatoes, beets, carrots, and turnips); pasta, rice, and legumes; firm fruits (e.g., cranberries and apples); and seafood (e.g., lobster, shrimp, mussels, and clams).

Poaching

Poaching is a potentially appropriate cooking method for most foods; the downside is loss of color and nutrients (as in boiling). The poaching liquid does not "boil" (rapid movement), so delicate foods are successfully cooked without falling apart during cooking. Poaching is an excellent cooking method choice for eggs and fish. These delicate foods hold up well in the gentle movement of the liquid and cook without the addition of fat. Poached eggs and fish may be flavored with stock, wine, or other flavorful liquids.

Delicate fruits and vegetables (e.g., asparagus, bananas, oranges, and berries) do well with poaching. Firmer types of produce (e.g., prunes, apples, and cauliflower) may be poached as desired. Brief poaching is a great way to reconstitute or just macerate (soften by soaking in liquid) dried foods, such as prunes and raisins. It is also used to reconstitute and remove salt from beef jerky and dried salted fish.

Simmering

Simmering foods in their own juices, or in a broth, allows flavors to develop and deepen and allows meats to tenderize. Soups, stews, and sauces (e.g., marinara) all benefit from continued cooking at low temperatures just under the boiling point for specific periods of time.

Steaming

Steaming is a great way to cook without adding fat, and the quick cooking speed reduces nutritional loss. Virtually all vegetables, fish, and seafood are steamed with great results. Tender vegetables are steamed with care to avoid overcooking. The same is true of dim sum dumplings that are commonly steamed with care in Asian cuisine.

Beef, lamb, pork, and poultry may be steamed. However, the color of the final product is not appetizing, and the texture of the meat surface may be equally unappealing. Yet for meats that have been browned first, steaming or pressure cooking is a great way to cook tough cuts of meat (e.g., brisket and ribs). They come out fork tender after pressure cooking.

Rice, legumes, grains, and potatoes may be steamed, but the food pieces may stick together in this cooking method. Restaurants that steam vegetables often create one layer of food to eliminate sticking. Typically, fruit is not steamed.

Braising and Stewing

Braising and stewing are similar, but they are not exactly the same. Braising involves large cuts of meat in enough liquid to partially cover it. In contrast, stewing involves small cuts of meat in uniform pieces that are totally immersed in liquid.

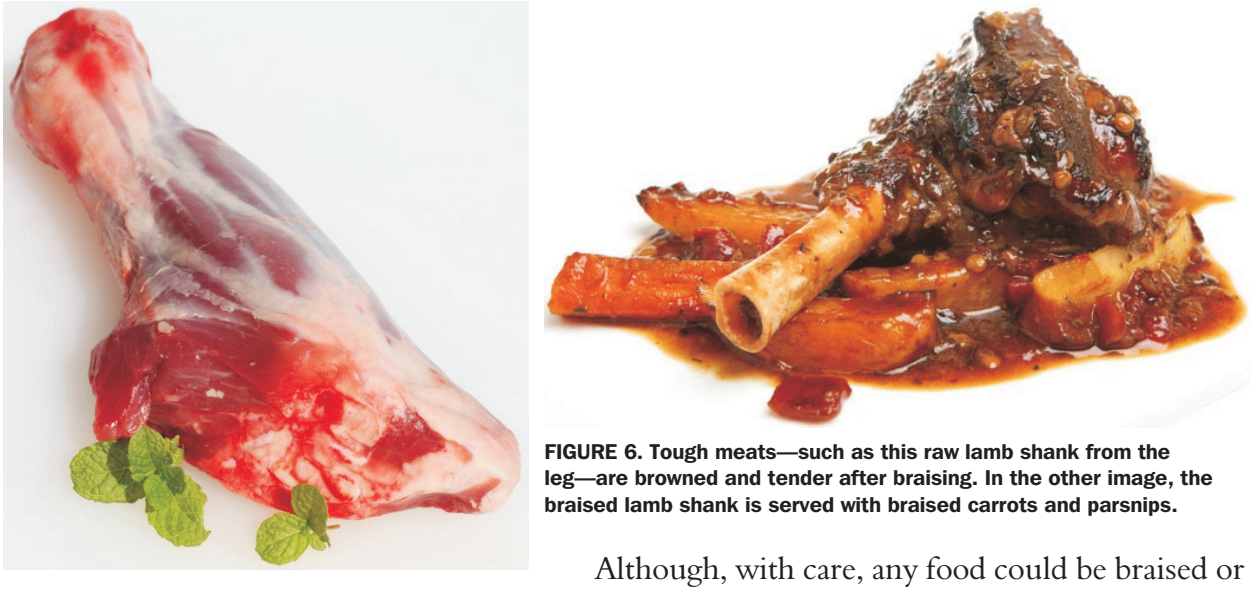

FIGURE 6. Tough meats—such as this raw lamb shank from the leg—are browned and tender after braising. In the other image, the braised lamb shank is served with braised carrots and parsnips.

Although, with care, any food could be braised or stewed, these techniques are best utilized with tougher cuts of meat: briskets, ribs, chuck roasts, and older chickens and ducks. These meats are high in fat and **connective tissue** (a substance that forms the walls of long muscles and binds them into bundles; it forms tendons and ligaments).

Connective tissue is quite tough. For the purposes of this lesson, it is composed of collagen or elastin. **Collagen** (white connective tissue) is an insoluble fibrous protein contained in connective tissue. Collagen breaks down into gelatin and water when cooked by moist heat. This breakdown helps tenderize meat and adds considerable flavor to it. Braising and stewing use collagen to an advantage. Meanwhile, **elastin** (yellow connective tissue) is a protein similar to collagen that is exceptionally tough and fibrous. It does not break down during regular or moist, slow cooking. Instead, elastin remains stringy and tough. Therefore, it needs to be physically removed and discarded or pounded and cubed (as for cube steak and ground meat) prior to cooking and/or serving.

Because braising and stewing methods incorporate searing (quick, hot cooking that adds flavor and caramelization through browning) and slow simmering in a flavorful liquid, these methods are not limited to tough meats. They are used successfully with many cuts of meats and poultry, though seldom (if ever) with fish and seafood, which would fall apart or become tough and rubbery.

Hard root vegetables (e.g., potatoes, turnips, and parsnips) and softer but more fibrous vegetables (e.g., celery and cabbage) have wonderful results when braised or stewed. Naturally, they do not cook as long as tough meats.

Summary:

Moist cooking methods are prized for their ability to tenderize and flavor older and tougher cuts of meat, to heighten and retain the color of fresh vegetables, and to create a delicious, succulent dish. Methods of moist cooking vary in cooking time, from extremely brief (blanching) to extensive (braising), and the foods range from

the most delicate (e.g., asparagus and tomatoes) to the toughest (e.g., chuck roast and beef shank).

Checking Your Knowledge:

1. Describe the difference between blanching and poaching.
2. What are the disadvantages of braising seafood and fish?
3. What are the advantages of steaming rather than boiling?
4. Which moist cooking method would you recommend to cook salmon? Why?
5. Describe liquid during a rolling boil, during simmering, and during poaching.

Expanding Your Knowledge:

One of the benefits of using moist cooking is the variety of flavors that can be introduced by choosing different flavor liquids for cooking. Stock, wine, beer, and sauces (e.g., soy and teriyaki) all bring their own flavors to the table. Liquids also bring other benefits and drawbacks to the cooking process. Do some research to find out how alcohol, salt, sugar, and steam pressure impact the cooking process.

Web Links:

Pressure Cooker
http://missvickie.com/library/benefits.html

Nutrition
http://www.webhealthcentre.com/HealthyLiving/diet_nutrition_cooknut.aspx

Marinade
http://www.sheknows.com/food-and-recipes/articles/2487/its-not-tough-to-tenderize-meat-just-make-a-marinade

Cooking Methods
http://culinaryarts.about.com/od/moistheatcooking/Moist_Heat_Cooking_Methods.htm

Moist-Heat Cooking Methods
http://www.how-to-cook-gourmet.com/moistheatcookingmethods.html