

Culinary Principles

A culinary technique is a step-by-step way to prepare a quality food product. Using a good recipe and the right culinary technique, a meat, poultry, or fish main dish can be prepared to meet quality standards. Seasonings and spices can be used to add variety to the flavor of cooked meats. Recipes should be used as a guide when adding seasonings.

This lesson is about basic cooking of meat, poultry, and fish from scratch. The term *meat* includes beef, pork, lamb, and veal. The principles and culinary techniques can be used with all of these meats, as well as with turkey or chicken, and with fish.

As foodservice professionals, it is important to know basic principles of cooking meats. These principles explain why a recipe works.

Cooking meat and poultry

- changes its texture,
- changes its flavor,
- changes the way it looks, and
- kills any bacteria that might be in the raw product.

Check for Doneness

The only way to be sure a meat or poultry product is cooked until done is to use a meat thermometer or a stem-type thermometer to test internal temperature of the product. Meat, poultry, and fish should be cooked until the internal temperature in the thickest part reaches 165 °F. The temperature of meat, poultry, and fish is very important to be sure that the food is safe to eat. Undercooking a meat, poultry, or fish product could lead to an outbreak of foodborne illness or food poison.

Cooking always causes loss of moisture. This is called cooking loss and results in shrinkage. As a meat gets more done it loses more moisture. This is why it is so important to follow the recipe for cooking temperature and cooking time.

Overcooking a meat, poultry, or fish dish will cause

- the yield to be less than the number of servings planned;

- the flavor to be lost;
- the meat to be tough because the protein; structure has been changed; or
- the meat, poultry, or fish product to be dry.

Some people think that cooking meat and poultry in an oven on high heat seals in the juices and causes less shrinkage. However, this is generally not true. To obtain a tender product, it is best to cook meat and poultry at a constant moderate temperature. The recipe will give the right temperature for the product. A rule of thumb is to cook meat and poultry in a conventional oven at 350 °F. Both the temperature and time should be adjusted for a convection oven. Generally, the temperature for a convection oven should be reduced by 25 °F–50 °F from that of a conventional oven. The time may need to be reduced also (about 25% less cooking time).

A Tender Product

Everyone has heard the expression, “It’s a tough old bird.” That old saying explains that age is the main reason that meat becomes tough. As an animal becomes older, the connective tissue that holds the flesh together gets coarser and has less moisture, making the meat tougher. To make meat or poultry tender, several things can be done to change the connective tissue.

- Cook the meat or poultry by moist heat (add liquid and cook slowly).
- Break up the connective tissue by grinding, chopping, or tenderizing in some other mechanical way (example is ground beef).
- Add a tenderizer. Marinating meat and poultry can help to tenderize the meat as well as add flavor.

Reduce the Fat

All meat, poultry, and fish has some fat in the meat. Here are some suggestions for reducing the fat when cooking meat and poultry.

- Cook ground beef until done and then drain it well using a colander. Current USDA recommendations state that ground beef should be drained but not rinsed after it is cooked.



Culinary Principles, *continued*

Rinsing is not recommended because it causes the meat to lose flavor and causes the temperature to drop into the Danger Zone (41 °F–135 °F).

- Cook ground beef patties in the oven on a rack so the fat can drain off. Another option is to use a pan liner and drain the patties after cooking.
- Trim off visible fat on any solid meat product before it is cooked. Because fat carries flavor, reduced fat recipes may need to have added seasonings. Follow the recipe.
- Drain off any fat and liquid from cooked meat before it is placed in the warmer or on the serving line. Do not let meat remain in the fat from cooking.
- Cool cooking liquids to be used for a sauce in the refrigerator so the fat hardens. Then remove the fat and reheat the remaining flavored liquid to prepare a sauce, gravy, or serve as is.
- Cook chicken without the skin to reduce the fat. Poultry carries a layer of fat just under the skin. It is recommended the skin not be eaten to reduce the fat in a poultry product. This means that either the poultry product should be skinned before cooking or skinned by the customer before eating. When cooking skinless poultry, such as skinless chicken breasts, follow a recipe that includes a way to prevent the skinless pieces from drying out. This may include marinating the breasts before cooking, cooking in a sauce, or using a recipe such as oven-fried chicken.

Color Changes

The color of meat comes from a substance in the blood of the animal. When beef is exposed to air, the red color becomes stronger. The bright red color does not indicate freshness. This same red color becomes brown when the meat is cooked because of heat. In cured ham or corned beef brisket, the red color stays in the meat because of the curing process.

When meat spoils, the red color becomes brownish or gray. Never prepare meat that has an off-color or a bad smell.

Culinary Techniques Used to Cook Meat, Poultry, and Fish

There are many different culinary techniques used to cook meat, poultry, and fish. They can be organized into two groups.

- Culinary techniques that use dry heat
- Culinary techniques that use moist heat

Dry-heat Cooking

Dry-heat cooking has no added moisture and is used for more tender pieces of meat, poultry, and fish. These culinary techniques include broiling and grilling, roasting (or baking), and cooking with heated fat, such as frying or pan-grilling.

Dry-heat techniques can be used to cook

- meats like some roasts, steaks and other quality cuts of beef, and ground meats,
- ham and other pork products,
- turkey and chicken, and
- fish filets and nuggets.

Moist-heat Cooking

Moist-heat cooking includes a variety of techniques where some liquid is added during the cooking process. The culinary techniques include braising, stewing, and poaching. Meat, poultry, and fish that is tougher has to be cooked using moist-heat culinary techniques in order to tenderize it. Tender products like fish and poultry can also be cooked by a moist-heat culinary technique such as poaching.

Braising and stewing are combinations of a dry-heat and moist-heat techniques. The first step is the dry-heat technique called searing which provides flavor and color. Then liquid and flavorings are added and the product is simmered until done. When this technique is used with a large piece of meat it is called braising. The same technique used for smaller pieces of meat, poultry, or fish is called stewing.



Flavor Enhancement

The flavor of meat, poultry, or fish is affected by the animal's diet. For example, when pigs are fed on peanuts the flesh has a slightly nutty flavor. Sometimes this is advertised for country hams. No matter what the animal has been fed, to get the best flavor the recipe must be followed.

The flavor of meat, poultry, and fish is also affected by the fat in the product. Flavorful oils in the flesh are in the fat part of the meat. To reduce the amount of fat in school meals, it is best to use meat and poultry products that contain less fat. Remember, when fat is taken out, flavorings and seasoning become even more important. Select and use recipes that include seasonings that add flavor to meat and poultry dishes.

Some recipes call for meat, poultry, or fish to be marinated. This is a good way to add flavor by soaking the product in a mixture of seasonings and liquid before it is cooked. A marinade, the liquid for soaking the meat or poultry, usually has three parts.

1. A small amount of oil keeps the meat moist
2. An acid ingredient helps to add flavor (examples are vinegar, lemon juice, or other fruit juice)
3. Flavorings such as spices, herbs, and flavorful vegetables like onions or celery add flavor

The meat is placed in the marinade, covered, and refrigerated for a few hours or overnight. It is very important to keep meat cold (below 41 °F) while it is in a marinade.

A marinade should never be reused for other meats but should be discarded after the meat is removed to be cooked. An example of a product that could be marinated is chicken breasts or cut-up chicken. The chicken can be marinated overnight in the refrigerator, then the marinade drained off, and the chicken baked or oven-

fried. Some recipes call for the marinade to be heated to the boiling point, reduced by simmering, and then served with the meat. This is acceptable since the marinade has been heated thoroughly and any bacteria destroyed.

A creative idea is to use dry marinades or rub to add flavor to meat and poultry products. A dry marinade is usually a mixture of spices rubbed on the meat or poultry before cooking. No liquid is used. This is a great flavoring technique that adds no fat. Look for recipes for dry marinades. In school lunch menus, a dry marinade would be a great way to flavor unbreaded chicken.

Because salt draws out the moisture in a meat, it should not be added to a marinade. If a recipe calls for salt, add it to the meat just after it has been cooked.



Culinary Technique Dry Heat - Roasting or Baking

Roasting or baking is cooking meat, poultry, or fish in the oven without liquid and without a cover on the cooking vessel.

1. **Remove all visible fat.**
2. **Season.**

Follow the recipe. Add appropriate seasonings and flavorings to replace flavor lost when fat is removed. If a meat thermometer is used, place it in the thickest part of the meat, away from bone or fat. Since salt penetrates meat only about an inch and retards browning, most recipes suggest adding salt at the end of cooking. Do not add salt unless the recipe calls for it.

3. **Place in the cooking utensil.**

Do not cover and do not add any liquid. Place meat on a rack when appropriate so fat will drain and hot air can circulate on all sides.

4. **Roast or bake in a slow oven until the internal temperature is at least 165 °F (or a higher temperature specified in the recipe).** Follow the recipe for the oven temperature. Some recipes for large pieces of meat or poultry suggest adding a mirepoix to the pan during the last half hour of roasting.

5. **Remove from the oven and serve.**

For large pieces of meat, like a turkey or a large roast, allow the meat to sit in a warm place for about 15 minutes before carving or slicing. This makes the meat firmer, juicier, and easier to slice. Meats should be sliced across the grain.

6. **Hold cooked meat and poultry the correct way.**

If the meat or poultry will not be served immediately, it should be covered and kept in a warmer at the correct temperature or chilled in the refrigerator. Never hold a meat product at room temperature.

Try these USDA Recipes that include this Culinary Technique

Barbecued Chicken	D-11
Country Fried Steak	D-21
Meat Loaf	D-27
Oven Fried Chicken	D-29
Salisbury Steak	D-33
Honey-Lemon Chicken	D-44
Baked Cajun Fish	D-46
Baked Fish Scandia	D-47



Culinary Technique Dry Heat - Sautéing

Sautéing is using high heat and a small amount of fat to cook meat, poultry, and fish rapidly. Searing and stir-frying are also a sautéing technique.

1. Prepare the meat or poultry by making sure it is dry.

If a marinade has been used, drain it thoroughly and pat the food dry. Food with a lot of moisture will steam rather than sauté.

2. Add oil to the pan according to recipe.

A tilting braising pan is ideal for this technique. Measure the oil carefully.

3. Heat the oil; add the meat, poultry, or fish.

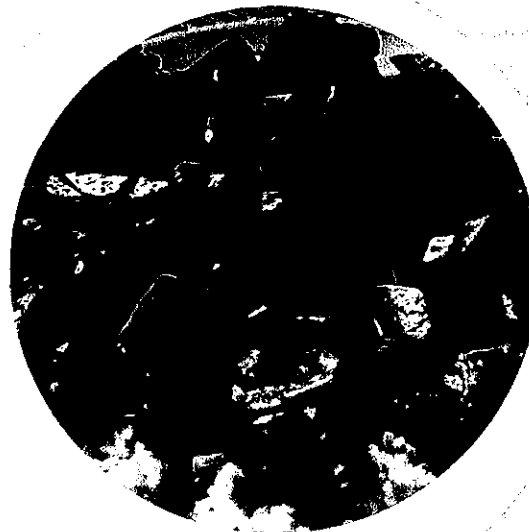
The meat, poultry, or fish pieces should be added to the pan in a single layer. If the pieces are touching, the product will steam, not sauté.

4. Cook the meat by gently turning until browned on all sides and cooked evenly.

Some recipes suggest that the cooked meat be removed from the pan and the remaining flavored juices be used to make a sauce. Follow the recipe.

5. Hold cooked meat and poultry the correct way.

Sautéed meals should be cooked in batches just-in-time for service. Covering a sautéed food during holding causes it to steam and the advantages of the sauté technique are lost. Serve immediately. Never hold a meat product at room temperature.



Try these USDA Recipes that include this Culinary Technique

Chicken Stir-Fry D-39

Beef Stir-Fry D-39A

Pork Stir-Fry D-39B

Chicken Fajitas D-40

Culinary Technique Moist Heat - Braising and Stewing

Braising and stewing are a combination of dry-heat and moist-heat cooking used for less tender cuts of meat. Braising is used for large cuts of meat. The same technique is called stewing when used for bite-sized pieces of meat, poultry, or fish.

1. **Trim fat and prepare meat according to the recipe.**
2. **Sear the meat on all sides.**

Searing meat before braising or stewing adds color and flavor. Follow the recipe to use a small amount of oil or preferably, no oil. Brown the meat on all sides in a hot pan. For large pieces of meat, use a pan in the oven or a steam-jacketed kettle. For smaller pieces, use a tilting braising pan, a grill, or brown in a hot oven.

3. **Remove the meat from the pan and add a mirepoix.**

Some recipes call for a mirepoix to be added to the pan and cooked. Follow the recipe.

4. **Add the seared meat back to the cooking pan along with the liquid for cooking.**

When a steam jacketed kettle is used for braising or stewing, more liquid will be needed than when using a roasting pan in the oven or when using a tilting braising pan. Follow the recipe and avoid using too much liquid, which weakens the flavor of a sauce made with the liquid.

5. **Cover tightly and simmer until tender.**

Follow the recipe for the temperature and time for the equipment being used. Do not allow the liquid to boil. The size of the cut of meat and the kind of meat will also influence the cooking time. Braised or stewed meats are done when they are tender.

6. **Remove the meat from the cooking liquid.**

Some recipes suggest the cooking liquid be cooked an additional time to reduce the volume and concentrate the flavor. The cooking liquid may also be thickened with a roux or slurry. How to thicken using a roux or slurry is described in the lesson on Preparing Sauces.

7. **Hold cooked meat and poultry the correct way.**

If the meat, poultry, or fish will not be served immediately, it should be covered and kept in a warmer at the correct temperature or chilled in the refrigerator. Never hold a meat product at room temperature.

Try these USDA Recipes that include this Culinary Technique

Beef Stew D-14

Chili con Carne with Beans D-20

Sweet and Sour Pork D-36

