



## Culinary Review - Meats

Meat is very important in that it is the main component of many entrees and recipes. A personal chef typically spends a lot of time and money on meat and meat dishes.

Meat comes from the flesh of domestic animals and wild game animals. The most common meats are beef, pork and lamb. Venison is a popular game animal.

Understanding the composition of meat, important factors in selecting meat, various cuts, and cooking and storage methods used for meat are central to preparing quality meat dishes.

### Composition and Structure

Meat is muscle made up of water, protein and fat. It contains about 75 % water, 20 % protein, and 5% fat.

The large amount of water in meat is the main reason it shrinks when cooked. If meat loses too much moisture, caused by coagulation, it will become tough and lose weight and volume.

Protein is an important nutrient, and when heated causes coagulation: losing moisture and becoming firmer. Cooking a steak sufficiently (rare, medium or well, for example) is directly related to the amount of coagulation that occurs during cooking. Protein will toughen if cooked at temperatures that are too high.

Although in today's world there is a rising concern for the amount of fat in our diet, fat in meat does have many benefits. Fat helps maintain meat's juiciness. The marbling in meat is fat that is deposited in the muscle tissue. During cooking, this replaces some of the moisture inside the muscle and helps to maintain juices. The marbling also separates the muscle fibers, making meat tenderer and easier to chew. Fat on the surface of meat helps prevent the meat from drying out during cooking as well as storage. Fat is also the main contributor to flavor in meats. Higher grades of steak usually have more marbling.

Though meat contains only very small amounts of carbohydrates, they are very important. These carbohydrates are the reason meats can be browned, and browning is crucial for bringing out the flavor and color of meat. Meat's structure is composed of two parts: the muscle fibers and the connective tissue. The muscle fibers are long strands bound together in bundles. These bundles of fibers determine the grain and texture of the meat. Smaller strands create a fine grain while larger ones are coarse. Connective tissue refers to the proteins that bind the muscle strands. Connective tissue is tough but some types can be cooked and broken down. Meats that are high in connective tissue come from muscle fiber that was exercised a lot, such as the leg, or from older animals. Connective tissue can be either collagen or elastin.

Collagen is a white tissue that can be broken down and made tender by using the correct cooking methods. To tenderize meats that have connective tissue use a moist heat method at a low temperature. Elastin is connective tissue that is slightly yellow in color and cannot be broken down by cooking. The only way to tenderize the elastin is to physically remove it or mechanically break it down. The following are methods of breaking connective tissue down:

**Pound or cube** meats are steaks that have been run through a machine that is designed to tenderize the meat using a series of rollers. Of course, it is most convenient to buy pound meat, or cubed steaks, from the market rather than tenderize the meat yourself.

**Grind.** You can use a meat grinder to pulverize the connective tissue. With some meat, chopping it well in a food processor achieves the same effect. Slice thin against the grain. Cutting very thin at right angles to the strands of connective tissue makes the tissue too small and short to effectively toughen the meat or be noticed when eating. This is typically done with roast beef, flank steak and London broils.



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### Selecting Meat

#### Inspections and Grading

It is a federal law that all meat must be inspected. Inspection is a guarantee of wholesomeness. It means that the animal was free from disease and is fit for human consumption.

Grading is a quality designation based on texture, firmness, color of the meat, age and maturity of the animal, and marbling, and is not required by law. Beef, veal and lamb are graded. Pork is not. The top two USDA grades are Prime and Choice. These are the grades that should be used. Meat graded below "choice" is usually not very tender and not usually sold in retail stores. Meat should be labeled "USDA prime" or "USDA choice". If the words "prime" or "choice" appear on meat and are not preceded by the letters "USDA," the USDA did not inspect them. Instead, the butcher put them there to entice people to buy the product.

#### Aged Meat

Aging meat makes it more tender and flavorful. It is done in coolers under controlled conditions so that the natural enzymes have time to break down the flesh. Beef and lamb are aged. Pork and veal are not. Aged meat is not "old" meat. Conditions for aging must be controlled to prevent spoiling. There are two types of aging: wet and dry.

Wet aged meat comes from carcasses that are broken down into smaller pieces and placed into plastic vacuum-packed bags. These packs are usually referred to by their trade name "Cryovac." The bag protects the meat from bacteria and mold while it is refrigerated. The aging process continues while the bags are stored and the enzymes continue to work on the meat. Meat aged too long can break down too much.

Dry aged meat is prepared by hanging meat pieces inside of coolers under controlled conditions. The meat may lose up to 20% of its weight from loss of moisture. Dry aged meats take longer to age, are more expensive and usually have superior flavor and tenderness. They are not typically sold to the general public.

#### Beef

Technically meat from any full grown ox, bull, cow or steer is considered beef. Commercially, almost all beef comes from steers (castrated male cattle). Oxen are too tough, bulls are too unruly and cows fatten too slowly. The beef industry is always trying to improve the breeds used through selective and crossbreeding. The goal of the industry is to produce breeds with higher yields, better disease resistance and a more efficient feed-to-muscle conversion ratio.

#### Beef Quality

The number one determination of the quality of beef is the diet of the animal. Grain fed or grain finished cattle are the best because they develop more marbling (intra muscular fat). Corn fed beef is considered the best (in America). Animals that are just grazed or fed a lot of grasses tend to have tougher meat. Another factor in beef quality is the age of the animal. Young animals are more tender, but usually lack flavor. Older animals have more flavors but are tougher. Beef quality can be increased through the aging processes discussed previously. The longer the beef has been aged (up to a certain point), the tenderer it becomes. The availability of aged meats is limited in retail markets. Most aged beef is sold to restaurants. The three major grades of beef are prime, choice and good. Prime and choice are the beef grades that primarily are used by personal chefs and restaurants. Beef graded "good" tends to be tough.



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### **Veal**

Veal is prized for its tender texture and mild flavor along with its versatility with a variety of dishes and recipes. The meat from veal is pale and delicate. Young calves no older than four months are considered veal. Calves older than six months are beef.

Veal has little fat and no marbling so it can become tough and dry if overcooked. Veal is often pounded into very thin "scallops" so it can be cooked quickly and remain tender. Milk fed veal is the palest and most delicate veal available. If veal is fed grass the meat will turn red and have a strong flavor.

Bones from veal are preferred for making stocks because they develop good color and are high in natural gelatins. Ground veal is usually made from breast and shoulder meat, but can include trim from other cuts. Veal loins give us cutlets, along with loin chops and rolled loin roasts. These cuts are usually sautéed, broiled, braised or baked. The legs are sold as roasts, although some scallops are cut from the center (true scaloppini). The shoulder meat is used for stews and braising. Ribs are sold as racks for crown roasts or French cut chops.

Generally, veal is cooked using a moist heat method because of its lack of fat content; except for the scallops that are pounded as thin as possible and cooked very quickly.

### **Pork**

Pork is a descendant of the wild boar. Historically pigs were the mainstay of peasants because pigs were scavengers and very easy to feed. They were good breeders, averaging 11 offspring twice a year. Almost all of their parts were used and their meat was easy to salt and cure.

Because fresh pork and cured pork are handled differently we will discuss them separately.

### **Fresh Pork**

Select pork that has a pale to pink color. Loins will be lighter than the shoulder and leg. The flesh and fat should be firm to the touch. Pork should smell fresh with no off odor.

Pork should be stored in the coldest part of your refrigerator and should be used within 2-3 days. Large cuts will keep slightly longer, while ground pork won't keep quite as long. Pork can be frozen immediately after purchase and kept for up to six months with larger cuts, and three months for chops and ground pork.

Almost all pork roasts and barbecues well. Chops, cutlets and slices are cooked like beefsteaks.

### **Cured Pork**

Cured Pork is fresh pork that has been cured in any one or a combination of methods. The two most popular curing methods are by dry salt rubs or the use of brines. After curing, pork is often smoked or air-dried. Pork was originally cured so that it would keep for long periods of time at room temperature. Today's pork is not cured to that degree. All of today's cured pork products need to be refrigerated with the exception of Prosciutto, Smithfield and Virginia hams. These hams have been salted and aged for up to one year. Their price is a direct reflection of the time and aging that went into their production.

Bacon and ham are usually injected with brine and then smoked for flavor. Bacon is made from pork bellies and the addition of brine is the main reason for its tremendous shrinkage. Canadian bacon is pork loin that has been cured and smoked. Salt pork is cured but not smoked bacon.



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### Lamb

When sheep are slaughtered they are tough and have a strong flavor. That is why we only use the young sheep (lamb) for meat. Today's lamb is the result of sophisticated crossbreeding. Lambs are slaughtered between 6 and 9 months old. Lambs older than 12 months cannot be legally sold as lamb. The older the animal is, the tougher the meat. Lamb is the meat preferred in the Middle East, North Africa and Greece and is widely used in India, France, Spain, England and New Zealand. Lamb is much less common in the United States and is virtually unknown in Japan and Southeast Asia

### Basic Principles of Cooking Meat

Cooking methods previously discussed are specifically applied to meat in the following section.

Meats are basically protein and connective tissue. These components are affected in two ways when heated:

- ❖ The connective tissue is tenderized

This occurs if moisture is present and the meat is cooked slowly, using a low temperature.

-or-

- ❖ The proteins toughen

Even meats that have very little connective tissue will become tough and dry if they are cooked too long at too high a temperature.

In conjunction with dry or moist cooking process, there are some basic principles involved with low heat and high heat cooking.

- ❖ Low heat cooking generally is used for most meat because it breaks down connective tissue, especially When used with moisture.
- ❖ High heat tends to toughen and dry out meat; however, this method is still applicable.
- ❖ Roasting, a dry heat method without fat, and braising are examples of low heat methods usually used to Cook larger pieces of meat. Broiling and grilling (also dry heat processes without fat) are examples of high Heat methods used to cook smaller pieces of meat.

Think about the different dry heat (with or without fat) or moist heat cooking methods. Think about the equipment used, length of time to cook and amount of fat used as you read about high and low temperature. Compare the following examples:

High temperature, such as for roasting, is done using temperatures between 375 and 450° F (190-230° C). This usually is done with smaller pieces of meat that are well browned on the outside, but rare on the inside with a lower internal temperature. The cooking times are kept short so that there is a minimal amount of shrinkage. Racks of lamb and beef tenderloins are two examples of meats with which it is good to use this method.

By contrast, low temperature roasting is said to be superior to high temperature roasting because it results in less shrinkage and cooks more evenly from the outside in. Roasted meats are usually juicier, more flavorful and tender. They are also easier to carve. Low temperature roasting is done at a temperature of 250 to 325° F (120-160° C), depending on the size of the cut and time constraints on production.

Broiling is somewhat contradictory to this principle. When cooked properly, broiled meat is tender. This occurs due to meat being cooked quickly on the outside while the inside takes time; the heat is being conducted into the center of the meat more slowly. Since the meat in the center does not overcook, the meat stays tender.



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Searing is the quick browning of meat using intense heat to seal in the meat's natural juices and impart more color and flavor. This can be done using dry heat in an oven or skillet. Searing is often done prior to slow, low temperature roasting. It is also used in braising and preparing meats for stews.

Braising is a combination cooking method that is good for cooking tougher roasts and cuts of meat. The meat is seared at a high temperature (usually with fat) and then cooked slowly at a low temperature with the addition of moisture (usually covered). This helps break down the connective tissue. This works well with shank and chuck roasts that are often referred to as "pot roasts."

Stews are considered braised. Fricassees are similar to braised stews except that the meat is cooked at a low heat first (with fat) and not allowed to brown. Then the liquid is added and the meat is finished with low heat. Many chefs prefer to only use the term "braising" for large cuts of meat, but the method using dry heat works the same for small cuts as well.

Hint: Meats should be simmered, and never boiled, to avoid overcooking. This is because liquids and steam conduct heat more quickly. Cooking the meat too quickly causes the proteins to become tough.

Remember, there is more connective tissue in the muscles of animal that are used and exercised more frequently. Cuts of meats from these muscles, such as legs and shoulders, should be cooked using moist heat.

You can see how different combinations of meat and cooking methods produce different results. Remembering basic principles will arm you for the decisions needed in creating the best product. Next is the question: Once the meat and the method are chosen, how might you know when the meat is cooked to completion?

### **Sufficiently Cooked Meat**

To determine whether meat is cooked sufficiently depends on the method used for cooking the meat. Meat cooked with the moist heat method is done when the connective tissue has broken down enough for the meat to be palatable and sufficiently tender.

Meat cooked with dry heat is done when the proteins have reached the desired degree of coagulation. This is generally determined through internal temperature. Meat should reach a temperature where it is cooked properly while preserving its juiciness and tenderness. Determining when meat is done can be difficult and takes some skill and experience.

### **Internal Temperature**

Meat cooked to completion is based on the internal temperature of the meat and not the external appearance. Because of this, judging when meat is done becomes tricky. There are many factors that can influence when meat reaches the proper temperature.

To know when meats are done the chef must know the exact temperature of the center of the roast or steak. Meats that are cooked past a medium internal temperature will become tougher and drier as the meat continues to cook through. Roasts that are cooked at lower temperatures will result in a higher yield due to less shrinkage and moisture loss as compared to those cooked at higher temperatures.





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Internal temperature is best measured with a thermometer. Either a standard thermometer or an instant read thermometer work well. The standard thermometer is placed in the meat and left there. An instant read thermometer is placed in the meat as needed. To get an accurate reading, place the tip of the thermometer in the very center of the meat (making sure the thermometer is sanitary before insertion).

### Carry-over Cooking

Carry-over cooking can raise the temperature of the meat from 5 to 25 degrees, depending on its size. Roasts generally should be removed from the oven 10-15 degrees below the temperature desired and left to rest for 15-30 minutes before slicing. The carry-over cooking will bring the roast up to the proper serving temperature while allowing the meat to set, making it easier to handle and slice. Cooking smaller steaks to the proper temperature is difficult. The small size makes using a thermometer virtually useless and the carry-over cooking makes the proper timing very difficult. Experienced chefs rely on touch, sight and length of time to determine when meats (in general) are cooked sufficiently.

### Color

Recall the effect of carbohydrates in meat. As mentioned earlier, carbohydrates are responsible for the browning, or caramelizing, of meat. Noting the color of meat as it cooks will help you assess when it is done. As meats cook they change colors progressing from the outside in. The red meats (beef and lamb) change from red to pink to gray to a gray-brown as they cook. The white meats (pork and veal) change from pink to gray-pink to a white or off-white.

### Specific Meat Cuts and Cooking Methods

You have thus far acquired information about composition of meat, selecting quality meat, the general categories of meat and basic principles of cooking meat. The next section will explain specific characteristics of meat cuts and proper methods in which to prepare the various cuts.

#### Rib and Loin Cuts

Rib and Loin are generally more tender cuts of meat. They are used primarily for steaks, chops and roasts and are almost exclusively broiled, grilled or roasted.

Beef and lamb cuts usually are cooked rare or medium rare.

Veal and pork cuts usually are cooked until well done and are sometimes braised to help preserve the juices. Sautéing or pan-frying is a method that works well. Because of the low fat content of veal chops, use caution when broiling them to avoid drying the meat out.

#### Leg or Round Cuts

Beef rounds are very low in fat and tend to be less tender. They are used most commonly for braising. High-grade rounds or inside rounds are used for roasts, but must be cooked at a very low temperature for a long period of time. Often they are cooked only to medium-rare and sliced thin to serve. Veal, lamb and pork are very young animals and are tender enough to roast. The rounds of all four meats – beef, veal, pork and lamb – have the same basic structure.

#### Chuck or Shoulder

Chuck and Shoulder are tough cuts. Beef, veal, lamb and pork chuck is usually braised. Veal, lamb and pork also can be roasted or cut into chops; however, they are often impossible to cut because the grain of the meat goes in multiple directions.



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### **Shanks, Breast, Brisket and Flank**

These are the toughest cut, even from very young animals. They almost always are cooked with moist heat.

Shanks are excellent for braising and stewing because they produce a lot of gelatin. The gelatin gives the cooking liquid good flavor and body. These cuts need a long cooking time to break down the connective tissue. However, they can become moist and juicy due the amount of fat they contain. Flank steaks can be very good broiled if they are marinated, cooked rare, and sliced thin across the grain.

### **Ground Meat, Cubed Steaks and Stew Meat**

Ground, cubed or stew meats can come from any of the other cuts or sections. These are generally made from trimmings.

Ground meats and cube steaks can be cooked by either dry or moist heat methods because they were tenderized mechanically. Stew meat is cooked strictly with moist heat.

### **More about Ground Meats**

All of the major meats can be ground and used. It is more important to know the percentage of fat content when selecting ground meat than where the cut came from on the animal. The most popular ground meat is beef, or hamburger.

#### **Ground Beef**

When buying ground beef many people buy their beef as lean as possible for health and nutritional reasons. However, lean ground beef tends to be dry and flavorless. It is the fat, mixed in with the lean of hamburger that gives the meat its flavor and juiciness. Cuts of meat, too tough to cook like a steak, are as tender as round or sirloin after being tenderized by grinding.

#### **Ground Lamb**

Ground lamb can be seasoned into patties or kabobs and then pan-fried or pan-broiled, grilled or broiled. It also can be used in casserole dishes. Ground lamb usually is not combined with other ground meats because its strong flavor will overpower the other, milder ground meats. Ground lamb has a tendency to have a high fat content.

#### **Ground Pork**

Ground pork can be used with ground beef and veal to make exceptional meatloaves. It also can be used alone or with ground smoked-pork to make great tasting casserole dishes.

#### **Ground Veal**

Veal is very dry and, therefore, not well-suited for making hamburger patties. When ground veal is combined with ground beef or pork it can be used to make excellent meatloaf and casserole fillings.

#### **Additional Information**

Cold ground meats can be served after being cooked as meatloaf and pate. Steak tartar is a dish made from raw ground beef, eggs and onions. However, it is not recommended for a personal chef due to the possibility of meat contamination.



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One of the great things about ground meats is that they can be formed into many different shapes (from basic meatballs to elaborate imitations of other foods and items) or used to fill a variety of foods (such as cabbage and bell peppers).

Meatloaves can be made full size or individual size. They can be made into rings, domes or pies. The meatloaves themselves can be filled or stuffed with different ingredients.

### Steaks, Chops and Cutlets

Steaks are traditionally cooked quickly using a dry heat method. Typically, they are broiled, grilled or pan-fried. For a quality steak, start with a tender cut of meat, such as rib or loin cuts. A good steak will be tender, juicy and flavorful.

There are two major factors involved when selecting a steak. They are the grade of the cut and the location from which it was taken. The most expensive and most tender cuts come from the loin. These include the tenderloin, strip, T-bone and Porterhouse. Steaks that come from the round are not as tender and are often marinated. These include top round, eye round, bottom round, and tip steaks. Steaks from the chuck are not suited for dry heat cooking. These include arm, shoulder and blade steaks. There are several tips that can help you:

- ❖ When purchasing steaks one of the main things to look for is the marbling of the meat. These are • the tiny specks of fat that are imbedded in the muscle tissue. When you are selecting steak that is to be cooked rare to medium-rare it is best to start with a nice thick steak (approx. 1-2 inches) of even thickness.
- ❖ Always trim any excess or unwanted fat from the steak. This may have a tendency to catch fire • and burn. Do not remove all of the fat from a steak. Leaving some fat will add flavor and help prevent the meat from losing moisture and flavor.
- ❖ Broiled steaks should be cooked 3-4 inches away from the heat source. Remember not to broil in • an enclosed unit, such as an oven with the door closed. This creates an environment that bakes the item instead of radiating it. Steaks should be served immediately after cooking.
- ❖ As a personal chef, you may prepare a steak (and perhaps a sauce to accompany it) and leave it • with cooking instructions for your client.

### Steak Temperatures

The following are some definitions of steak temperatures. The times given are based on a 2-inch thick steak at room temperature, cooked in a heavy pan over medium-high heat. Caution: These times and temperatures will vary based on other unknown factors.

**Rare** - Brown outer crust, a deep-red interior (cold center) and juicy. Cooked 3 to 4 minutes per side.

**Medium-Rare** - Brown outer crust, pink interior and red center (warm). Cooked 5-6 minutes per side.

**Medium** - Brown outer crust and pink through the center. Still juicy. Cooked 6-7 minutes per side.

**Medium-Well** - Brown outer crust and just cooked throughout with no pink. Cook 7-8 minutes per side.

**Well Done** - Very brown outer crust, cooked completely through to gray, with very little juices remaining. Definitely not recommended for the tenderer and leaner cut. Meats cooked well done tend to be dry and tough.





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### **Marinating steaks**

Some meats that tend to have more connective tissue than the typical steak cuts are often marinated. To break down connective tissue with marinades, include an acidic liquid, such as wine, vinegar or lemon juice. The action of these liquids on the connective tissue will make the meat tenderer. Other ingredients that are added to marinades are there strictly to add flavor.

As a personal chef you may pre-marinate meat and leave for the client to cook or you can store marinade and meat separately, again with instructions.

Note: Marinades with a lot of acids in them are better when left separate or the acid may "cook" the meat or product.

### **Roasts**

There are two ways to roast meats. Meat can be roasted at a low temperature for a long period of time or at a high temperature for a short period of time. Review Basic Principles of Cooking Meat.

Use the tenderness of the cut to decide which method should be used. The most popular cut of beef, pork and lamb to roast is the rib roast. Beef, pork and veal tender loins are also very popular roasting meats. Beef round is traditionally roasted for roast beef.